

# A Font Family Sampler

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To assist in producing greater font face variation in university dissertations and theses, this document illustrates font family selection with a  $\LaTeX$  document preamble command

```
\usepackage{FAMILY}
```

where FAMILY is given in the subsection titles below.

The body font in this document is from the  $T_{\text{E}}X$  *Gyre Bonum* family, selected by a `\usepackage{tgbonum}` command in the document preamble, but the samples illustrate scores other font families.

Like *Computer Modern*, *Latin Modern*, and the commercial *Lucida* and *MathTime* families, the  $T_{\text{E}}X$  *Gyre* families offer extensive collections of mathematical characters that are designed to resemble their companion text characters, making them good choices for scientific and mathematical typesetting. The  $T_{\text{E}}X$  *Gyre* families also contain many additional specially-designed single glyphs for accented letters needed by several European languages, such as Đ, đ, Å, å, Ę, ę, Ł, ł, Ö, ö, Ó, ó, Ü, ü, Ũ, ũ, Š, š, Ť, ť, Ů, and ů.

## Comparison of text fonts

Some of the families illustrated in this section include distinct mathematical faces, but for brevity, we show only prose. When a font family is not chosen, the  $\LaTeX$  and Plain  $T_{\text{E}}X$  default is the traditional *Computer Modern* family used to typeset the *Art of Computer Programming* books, and shown in the first subsection.

NB: The LuxiMono font has rather large characters: it is used here in 15% reduced size via these preamble commands:

```
\usepackage[T1]{fontenc} % only encoding available for LuxiMono
\usepackage[scaled=0.85]{luximono}
```

### **\usepackage{}**

**% cmr**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatur vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

The sample is in the default *Computer Modern* family in  $\LaTeX$  and  $\TeX$ , patterned after the classic *Monotype Modern 8A* family. It is what you get when you do not supply a `\usepackage` command to select a non-default font. The *Computer Modern* family has regular, bold, italic, sans-serif, slanted, and typewriter variants, as well as an extensive repertoire of mathematics glyphs. Few other font families supply mathematical characters, so for them,  $\TeX$  falls back to *Computer Modern*.

### **\usepackage{avantgarde}**

**% pag**

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Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{bookman}**

**% pbk**

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Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{caladea}****% Caladea-TLF**

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Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{chancery}****% pzc**

*Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.*

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{charter}****% bch**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{comicneue}****% ComicNeue-TLF**

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Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: § ¶ © £ \$ €

**\usepackage{comfortaa}****% fco**

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 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{concrete}****% ccr**

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 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

Like the default *Computer Modern* family, the *Concrete* family has regular, bold, italic, sans-serif, slanted, and typewriter variants, as well as an extensive repertoire of mathematics glyphs.

**\usepackage{courier}****% pcr**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

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 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{crimson}****% Crimson-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ę Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ę ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{DejaVuSans}**

**% DejaVuSans-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{DejaVuSansCondensed}**

**%**

**DejaVuSansCondensed-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{DejaVuSerif}**

**% DejaVuSerif-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{DejaVuSerifCondensed} % DejaVuSerifCondensed-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

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Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{ebgaramond}****% EBGaramond-TLF**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Œ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{fourier}****% futx**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatur vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Œ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{gfsartemisia}****% artemisia**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Œ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{gfsartemisia-euler}****% artemisiaeuler**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatur vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Œ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{gillius}****% GilliusADF-LF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{gillius2}****% GilliusADFN0Two-LF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{helvet}****% phv**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{heuristica}****% Heuristica-TLF**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{kerkis}****% mak**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ę Ć Ń

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ę ć ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{libertine}****% LinuxLibertine-TLF**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ę Ć Ń

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ę ć ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{librebaskerville}****% LibreBaskerville-TLF**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ę Ć Ń

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ę ć ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{LibreBodoni}****% LibreBodoni-TLF**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ę Ć Ń

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ę ć ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €



**\usepackage{librecaslon}****% LibreCaslonText-OsF**

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Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{lmodern}****% lmr**

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Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

The sample is in the new *Latin Modern* family that extends the default *Computer Modern* family with additional accented letters for European languages, as well as adding many new mathematical glyphs.

**\usepackage{lmodern}****% lmtt**

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UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ę Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ę ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

The sample is in the typewriter font of the new *Latin Modern* family that extends the default *Computer Modern* family.

**\usepackage{lobsterTwo}****% lobsterTwo-LF**

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**\usepackage{luximono}****% ul9**

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 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{mathpazo}****% ppl**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscin cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ø Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ø ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: Œ Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{mathptm}****% ptm**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscin cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ø Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ø ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: Œ Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{merriweather}****% MerriweatherSans-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscin cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ø Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ø ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: Œ Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{mintspirit}****% MintSpirit-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{mintspirit2}****% MintSpiritNoTwo-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{newcent}****% pnc**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{noto}****% NotoSerif-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

The sample was typeset with the default serified roman fonts or `{\rmfamily . . . }` or `\textrm{. . . }`.

The *Google Noto* free font family supplies thousands of Unicode characters in many scripts, with reasonable family resemblance across alphabetic scripts.

### **\usepackage{noto}**

**% NotoSans-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

The sample was typeset with `{\sffamily . . . }` or `\textsf{. . . }`.

### **\usepackage{oldstandard}**

**% OldStandard-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{overlock}**

**% Overlock-LF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{palatino}**

**% ppl**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{PlayfairDisplay}**

**% PlayfairDisplay-LF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu r vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{quattrocento}**

**% Quattrocento-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu r vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{roboto}**

**% Roboto-TLF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu r vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

### **\usepackage{tgadventor}**

**% qag**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu r vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9      Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{tgbonum}****% qbk**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu r vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{tgchorus}****% qzc**

*Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu r vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.*

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{tgcursor}****% qcr**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu r vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{tgheros}****% qhv**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu r vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ć Ç Ñ

Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö œ ç ñ ß

Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l

Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{tgpagella}****% qpl**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{tgschola}****% qcs**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{tgtermes}****% qtm**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{times}****% ptm**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatu vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Æ Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö æ ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{universalis}****% UniversalisADFSStd-LF**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariaturn vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**\usepackage{utopia}****% put**

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariaturn vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis. Lacus curae fermentum, morbi vestibulum vel arcu sapien bibendum per.

UPPERCASE: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Æ Ø Å Ä Ö Ç Ñ  
 Lowercase: a b c d e f g h i j k l m n o p q r s t u v w x y z æ ø å ä ö ç ñ ß  
 Digits: 0 1 2 3 4 5 6 7 8 9 Letters: O Ø Q I l  
 Special symbols: † ‡ § ¶ © £ \$ €

**Comparison of fixed-width ('typewriter') fonts**

To change the fixed-width font in a  $\TeX$  document, issue the command

```
\renewcommand{\ttdefault}{ABBREV}
```

where ABBREV is the short name of a  $\TeX$  font family. You can do that multiple times, as we do in this section, but normally, you should be consistent and use a single fixed-width font for your document.

The short names used here were found by searching numerous style files for the string `\ttdefault`. The subsection titles are the long font family names, and are *not*  $\TeX$  package names.

In the examples, the first two lines of each verbatim display indicate column numbers. That is a useful one-time trick if you change `\textwidth` in your document, because you then know how long subsequent verbatim lines can be, and you can adjust them accordingly to avoid overfull boxes.

Notice the dramatic variations in text widths in the families shown below. For the common application of typesetting computer input and output in  $\TeX$  verbatim displays, you may prefer a narrow font face to maximize the number of characters per line.

Notice also that the *Eco* family fixed-width font has *old-style* digits, where half the numerals descend below the baseline.

Some fixed-width font families offer variants in series (bold) and shape (italic and slanted), so each subsection ends with a table illustrating those variants.



**Bera Mono**

```
\renewcommand{\ttdefault}{fvm}
```

0000000001111111112222222222333333333344444444445555555555666666666677777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatur vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

<b>Series and shape variants</b>	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

**CMBright**

```
\renewcommand{\ttdefault}{cmtl}
```

0000000001111111112222222222333333333344444444445555555555666666666677777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatur vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

<b>Series and shape variants</b>	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

**Computer Modern**

```
\renewcommand{\ttdefault}{cmtt}
```

0000000001111111112222222222333333333344444444445555555555666666666677777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatur vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

<b>Series and shape variants</b>	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

## Courier

```
\renewcommand{\ttdefault}{pcr}
```

0000000011111111112222222222333333333344444444445555555555666666666677777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatur vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

<b>Series and shape variants</b>	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

## DejaVu Sans Mono

```
\renewcommand{\ttdefault}{DejaVuSansMono-TLF}
```

0000000011111111112222222222333333333344444444445555555555666666666677777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatur vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

To scale the font, put something like this in your document preamble:

```
\usepackage[scaled = 0.8]{DejaVuSansMono}
```

<b>Series and shape variants</b>	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

## Droid Sans Mono

`\renewcommand{\ttdefault}{fdm}`

0000000011111111112222222222333333333344444444445555555555666666666677777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

Series and shape variants	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

## Eco

`\renewcommand{\ttdefault}{cmott}`

0000000011111111112222222222333333333344444444445555555555666666666677777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

Series and shape variants	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

## Inconsolata

`\renewcommand{\ttdefault}{zi4}`

0000000011111111112222222222333333333344444444445555555555666666666677777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

---

**Series and shape variants**


---

<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

---

**Latin Modern**

```
\renewcommand{\ttdefault}{lmtt}
```

00000000111111111222222222233333333334444444444555555555566666666667777777778  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio  
non maecenas, pariatum vitae congue laoreet semper, nulla  
adipiscing cursus neque dolor dui, faucibus aliquam quis.

---

**Series and shape variants**


---

<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

---

**Libertine Mono**

```
\renewcommand{\ttdefault}{LinuxLibertineMonoT-TLF}
```

0000000011111111122222222223333333333444444444455555555556666666666777777  
123456789.123456789.123456789.123456789.123456789.123456789.123456789.12345

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio  
non maecenas, pariatum vitae congue laoreet semper, nulla  
adipiscing cursus neque dolor dui, faucibus aliquam quis.

---

**Series and shape variants**


---

<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

---

**LuxiMono**

```
\renewcommand{\ttdefault}{ul9}
```

This sample was produced with the package option `\texttt{scaled = 0.85}`:

0000000011111111122222222233333333444444444555555556666666667777777778  
 123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio  
 non maecenas, pariatur vitae congue laoreet semper, nulla  
 adipiscing cursus neque dolor dui, faucibus aliquam quis.

To scale the font, put something like this in your document preamble:

```
\usepackage[scaled = 0.8]{LuxiMono}
```

---

#### Series and shape variants

<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

---

### New TXTT

```
\renewcommand{\ttdefault}{ntxtt}
```

0000000011111111122222222233333333444444444555555556666666667777777778  
 123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla  
 tellus metus odio non maecenas, \ldots.

---

#### Series and shape variants

<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

---

### NotoMono

```
\renewcommand{\ttdefault}{NotoMono-TLF}
```

This sample was produced with the package option `\texttt{scaled = 0.85}`:

0000000011111111122222222233333333444444444555555556666666667777777778  
 123456789.123456789.123456789.123456789.123456789.123456789.123456789.

Lorem ipsum dolor sit amet, aenean nulla  
 tellus metus odio non maecenas, \ldots.

To scale the font, put something like this in your document preamble:

```
\usepackage[scaled = 0.8]{noto}
```

---

<b>Series and shape variants</b>	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

---

## **TeX Gyre Cursor**

```
\renewcommand{\ttdefault}{qcr}
```

```
0000000001111111112222222222333333333344444444445555555555666666666677777777778
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.
```

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, pariatum vitae congue laoreet semper, nulla adipiscing cursus neque dolor dui, faucibus aliquam quis.

---

<b>Series and shape variants</b>	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

---

## **TXTT**

```
\renewcommand{\ttdefault}{txtt}
```

```
0000000001111111112222222222333333333344444444445555555555666666666677777777778
123456789.123456789.123456789.123456789.123456789.123456789.123456789.123456789.
```

Lorem ipsum dolor sit amet, aenean nulla tellus metus odio non maecenas, \ldots.

---

<b>Series and shape variants</b>	
<code>\bfseries</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\slshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>
<code>\bfseries \itshape</code>	<a href="http://www.math.utah.edu/">http://www.math.utah.edu/</a>

---

## **Scaling fonts**

A few fixed-width font families allow the font to be scaled uniformly by a package declaration in the document preamble like `\usepackage[scaled = 0.8]{font-package-name}`, as noted in earlier subsections. That is helpful

when the default monospaced character height differs from that of the prevailing prose font, which, except for T<sub>E</sub>X's own font families of *Computer Modern* and *Concrete*, and the commercial *Lucida* and *MathTime* fonts, is likely to be of a completely different design.

Regrettably, it does not seem to be possible to precisely control font scaling within a single document with standard T<sub>E</sub>X commands, other than by selection of the usual T<sub>E</sub>X size-changing commands: `\footnotesize`, `\tiny`, `\scriptsize`, `\small`, `\normalsize`, `\large`, `\Large`, `\LARGE`, `\huge`, and `\Huge`, and their corresponding environments like `\begin{footnotesize} ... \end{footnotesize}`.

One can achieve arbitrary dynamic font sizing by descending to low-level T<sub>E</sub>X font commands, such as with the input

```
{\font \dyntt = ul9r8t at 7pt \dyntt 7pt text},
{\font \dyntt = ul9r8t at 8pt \dyntt 8pt text},
{\font \dyntt = ul9r8t at 9pt \dyntt 9pt text},
{\font \dyntt = ul9r8t at 10pt \dyntt 10pt text},
{\font \dyntt = ul9r8t at 11pt \dyntt 11pt text}, and
{\font \dyntt = ul9r8t at 12pt \dyntt 12pt text}
```

that produces `7pt text`, `8pt text`, `9pt text`, `10pt text`, `11pt text`, and `12pt text`.

Proportional scaling is generally preferred to absolute font sizing, because it behaves as expected when the overall document font size is changed in the leading `\documentclass` command. You can scale fonts proportionally with the input

```
{\font \dyntt = ul9r8t scaled 700 \dyntt 70\%-scaled text},
{\font \dyntt = ul9r8t scaled 800 \dyntt 80\%-scaled text},
{\font \dyntt = ul9r8t scaled 900 \dyntt 90\%-scaled text},
{\font \dyntt = ul9r8t scaled 1000 \dyntt 100\%-scaled text},
{\font \dyntt = ul9r8t scaled 1100 \dyntt 110\%-scaled text},
and
{\font \dyntt = ul9r8t scaled 1200 \dyntt 120\%-scaled text}
```

to produce `70%-scaled text`, `80%-scaled text`, `90%-scaled text`, `100%-scaled text`, `110%-scaled text`, and `120%-scaled text`.

Clearly, such input is tedious to write, and hard to keep consistent throughout a large document. One solution is a private macro that is defined in the document preamble, or better, a private style file:

```
\newcommand{\mytt}[2]
{% Usage: \mytt{scale-in-0-to-1}{text}
  {%
    \dimen0 = 1000sp
    \dimen0 = #1\dimen0
    \count0 = \dimen0
    \font \dyntt = ul9r8t scaled \count0
```

```

        \dyntt #2%
    }%
}

```

It is later used with input

```

\mytt{0.7}{ 70%-scaled text},
\mytt{0.8}{ 80%-scaled text},
\mytt{0.9}{ 90%-scaled text},
\mytt{1.0}{100%-scaled text},
\mytt{1.1}{110%-scaled text}, and
\mytt{1.2}{120%-scaled text}

```

to produce 70%-scaled text, 80%-scaled text, 90%-scaled text, 100%-scaled text, 110%-scaled text, and 120%-scaled text.

Low-level font definitions with raw  $\TeX$  code are not affected by standard  $\TeX$  size-changing commands: compare

```
{\tiny \texttt{tiny typewriter text}}
```

to produce `tiny typewriter text` with

```
{\tiny \mytt{1.0}{tiny (whoops!)\ typewriter text}}
```

to typeset `tiny (whoops!) typewriter text`.

Despite our cautions about not conforming to  $\TeX$  size-changing commands, in documents that need to show a lot of computer input and output, our private macro is nevertheless a useful tool to squeeze long verbatim lines into the document line width, without having to introduce possibly-confusing line wrapping.

## Font color and style

It is easy to get colored text into a document using these preamble declarations

```

\usepackage[pdftex]{color}
\usepackage{rgb}

```

to define a number of  $\TeX$  macros, and color names.

The `rgb` package is a Utah addition that provides  $\TeX$  definitions of all of the named colors supplied by the X11 Window System on desktop Unix(-like) systems.

You can see X11's roughly 800 color definitions in the system-dependent files `/usr/openwin/lib/X11/rgb.txt` and `/usr/share/X11/rgb.txt`, or view them interactively in a terminal window like this:



```
% showrgb | less
199 21 133          medium violet red
176 196 222        light steel blue
102 139 139        paleturquoise4
159 121 238        mediumpurple2
...
61 61 61           gray24
255 255 255        white
0 205 205          cyan3
0 0 0              black
```

For use in  $\TeX$ , X11 color names are downcased, and embedded spaces are removed, so the first output line corresponds to the  $\TeX$  color `mediumvioletred`, which the `rgb` package defines like this:

```
\definecolor{mediumvioletred}{rgb}{0.780,0.082,0.522}
% #c71585 199 21 133 MediumVioletRed
```

The sharp-prefixed value in the comment is the hexadecimal equivalent that could be used in place of a named color in a command-line color option, such as these equivalent commands:

```
% xterm -bg 'medium violet red' -fg white &
% xterm -bg '#c71585' -fg '#ffffff' &
```

Knowing the hexadecimal values makes it easy to produce families of windows with slightly varying shades of color, such as these examples that use three-character hexadecimal colors differing by one digit in each primary color:

```
% xterm -bg '#4d8' &
% xterm -bg '#5e9' &
% xterm -bg '#6fa' &
```

The X11 color names have varied over time, so if you find a color name in `showrgb` output on your system that is not in the `rgb` package, scale its integer red, green, and blue values from the range [0,255] to the range [0,1] to provide a new definition like this:

```
\definecolor{teal}{rgb}{0, 0, 0.502} % #008080 0 128 128 teal
```

As described in Appendix C.14.3 of the  *$\TeX$  User Guide and Reference Manual*, the `color` package provides macros for coloring foreground and background of typeset material. For example, `\textcolor{red}{red text}` produces **red text**, and `\textcolor{blue}{\bf bold blue text}` produces **bold blue text**.

You can also supply background colors with

```
\colorbox{skyblue}{black on skyblue}
```

to get `black on skyblue`, or embellish that further with

```
\fcolorbox{red}{skyblue}{red-bordered black-on-skyblue text}
```

to typeset `red-bordered black-on-skyblue text`.

The text color inside the box can be changed as well, with input `\colorbox{teal}{\textcolor{yellow}{yellow on teal}}` to typeset `yellow on teal`.

Boxing interferes with line breaking, because color boxes are unbreakable horizontal material. You need to use them judiciously, and you may have to rewrite prose containing color boxes to help  $\TeX$ 's line breaking.

However, what if you want to color all verbatim text? You cannot include such text as an argument to other macros, so you have to dig into  $\TeX$  internal to find how the verbatim font is selected, and then insert a suitable color command. The standard file `latex.ltx` that defines the core of  $\TeX$  contains the one-line definition

```
\def\verbatim@font{\normalfont\ttfamily}
```

that sets the font for the verbatim environment, as well as for the `\verb` macro. Because it contains an at-sign, you need to redefine it in a private style file, where such characters are permitted in macro names.

Here is a reasonable set of definitions that allow you to dynamically change the default verbatim font color and style:

```
%% Internal macros
\def \verbatim@style {}      % default value
\def \verbatim@color {blue} % default value
\def \verbatim@font  {\normalfont \color{\verbatim@color}
  \ttfamily \verbatim@style}
%% Public macros for GLOBAL color and style changes:
\def \verbatimcolor #1{\def \verbatim@color {#1}}
\def \verbatimstyle #1{\def \verbatim@style {#1}}
```

You can then temporarily change colors inside a braced group with

```
{%
  \verbatimcolor{red}      \verb=red=,
  \verbatimcolor{blue}    \verb=blue=, and
  \verbatimcolor{hotpink} \verb=hotpink=
}
```

to typeset `red`, `blue`, and `hotpink` verbatim text.

You can also change styles, if the fixed-width font family permits, with

```
{%
  \verbatimstyle{\bfseries} \verb=bold=,
  \verbatimstyle{\itshape}  \verb=italic=, and
  \verbatimstyle{\slshape}  \verb=slanted=
}
```

to typeset **bold**, *italic*, and *slanted* verbatim text.

Finally, you can combine color and style with input

```
{%
  \definecolor {utahred} {rgb} {0.8, 0, 0}%
  \verbatimstyle {\bfseries \itshape}%
  \verbatimcolor {utahred}%
  \verb=Utah red bold italic=%
}
```

to typeset **Utah red bold italic** verbatim text.

Dark colors on light backgrounds generally work best.

Remember that color reproduction fidelity varies across output devices, and color perception by humans is often affected by culture, and by retinal differences. Notably, up to 6% of human males have difficulty distinguishing red and green: both may resemble shades of brown. If the three color names in the preceding sentence look similar to you, then you may have a degree of red–green perception difficulty.

Human color perception is also affected by viewing distance and ambient lighting. Prepare a lecture slide with black, blue, and red text on a light background, and then view it from different places in the classroom: you will likely find it hard to distinguish the text colors at long distances, unless the font is large and bold.

## Dangerous digits

In most font designs, decimal digits have equal widths, and thus, line up neatly in  $\text{\LaTeX}$  array and tabular displays. However, there *are* fonts where digits vary in width, and when that is the case, numerical displays may look quite peculiar. Pay attention to that point if you explore the font world more widely than we do in this document!

In font families that include a repertoire of mathematical characters, the text and math digits are usually identical, but that is not always the case. When they are not, you need to be particularly careful in marking your input. Here is an example:

```
A magician pulled $27$ rabbits out of a hat in 1933,
which is mathematically interesting, because $27 = 3^3$.
```

Digits that form a word, such as a calendar year, are *text* digits, whereas digits that count something are better treated as *math* digits.

The *Chicago Manual of Style* (16th edition, 2010) says on page 464 in its section *Numerals versus Words*:

In nontechnical contents, Chicago advises spelling out whole numbers from zero through one hundred and certain round multiples of those numbers.

...

Many publications, including those in scientific or journalistic contexts, follow the simple rule of spelling out only single-digit numbers and using numerals for all others.

Thus, the CMS recommends writing text like this:

The Senator owns seventeen houses, three condos, and two forest cabins.

There are exceptions, and it later suggests favoring consistency over the rule when several numbers are used in the same sentence, paragraph, or series of paragraphs:

A 12th Century Italian farmer named Bonacci had 0 fish, 1 dog, 1 rabbit, 2 cows, 3 cats, 5 goats, 8 sheep, and 13 chickens. His son later became quite famous for that peculiar number sequence.

## Confusing characters

The character shapes for several European-language letters and digits are subject to confusion, notably for the uppercase letters **O**, **Ø**, and **Q** and the digit **0**, and the letters lowercase **l**, uppercase **I**, and the digit **1**.

$\TeX$  does not even supply separate macros for Greek letters whose shapes are normally identical to corresponding Latin letters, such as uppercase alpha, beta, epsilon, and omicron, and lowercase omicron.

Look carefully at the font samples earlier in this document to see how well, or poorly, the fonts distinguish the problem glyphs. Some typewriter fonts have a right-leaning stroke through the digit **0**, like *Inconsolata*'s **0**, but that looks too much like the penultimate letters of the Danish and Norwegian alphabets, **Ø** and **ø**. The left-leaning stroke in the zero in the *TXTT* fonts **0**, and the dotted-zero **0** of *Bera Mono* and *DejaVu Sans Mono* remove the Scandinavian ambiguity.

The glyph shape distinctions may not matter much for a novel, where context generally removes ambiguities. However, in scientific writing, clear differences in character shapes are essential, and you need to choose your prose, mathematical, and typewriter fonts carefully.

In mathematics text, you should probably never use the lowercase letter **l**; instead, write `\ell` for  $\ell$ . Similarly, avoid the letter **O** unless it is suitably distinguished: in  $\TeX$  math mode and  $\LaTeX$  mathematical environments, write `\cal O(n)` for  $\mathcal{O}(n)$ , `\mathcal{O}(n)` for  $\mathcal{O}(n)$ , `\mathit{O}(n)` for  $\mathit{O}(n)$ , `\mathsf{O}(n)` for  $\mathbf{O}(n)$ , or `\mathfrak{O}(n)` for  $\mathfrak{O}(n)$ .

When such material appears repeatedly, encapsulate it in a private macro that tells what it is, not what it looks like, with input

```
\newcommand {\Order} {\mathcal{O}}
```

```
...
```

```
\emph{\textbf{Warning}: Gaussian elimination on $ n \times n $  
matrices takes $\Order(n^3)$ operations.}
```

to get **Warning:** *Gaussian elimination on  $n \times n$  matrices takes  $\mathcal{O}(n^3)$  operations.*