Macros to Change **Text** & ***Math*** fonts in TEX

19 *Beautiful Variants*

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Introduction

TEX typesets documents in Computer Modern fonts by default.[1] Donald Knuth's Computer Modern fonts are very elegant but sometimes we all look for a change. Many of us want to typeset TEX documents in fonts other than Computer Modern. Changing the font in *text mode*, i.e. the text font, in TEX is simple and there are many free fonts available with various typefaces like roman, **bold**, *italic*, *slanted*, ***italic bold***, ***slanted bold***, CAPS, **BOLD CAPS**, etc. The difficulty lies in changing the math fonts in TEX documents. This is mainly due to the lack of math fonts for TEX. Another reason is that changing the font in *math mode* is not as simple as changing the font in *text mode*. For LATEX there are various packages that can be used to change the font—text and math—with one statement. But for TEX, I could not find an easy way to change the font in the document—text and math. Using one font in *text mode* and another in *math mode* can spoil the look of the document. It is always desired to have text and math in the same font; text in New Century and math in Computer Modern do not go well. Though there are some combinations, as we will see later, that go well.

Being able to choose from different fonts is quite advantageous. Computer Modern fonts look very good on paper, esp. on inkjet printouts, but they look relatively thin on new computer screens (LCDs) and on laser printouts. For slide shows, most people prefer sans-serif fonts of relatively heavier weight. The idea of changing the entire font family which includes various typefaces like boldface, italics, etc., and the math fonts, with one control statement has been the motivation behind my work. For this purpose I have written 19 TEX macros that instruct TEX to typeset documents in the fonts called by those macros. In this document, the use of the above mentioned 19 font macros has been displayed. Each of these macros changes the fonts in the document globally, and can be used locally too, i.e. within a group. Now a TEX document, which is normally produced in Computer Modern, can be produced in 19 other font variants. These macro files can be easily understood, and changed if convenient. Each macro has various typefaces declared at 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, and 20pt sizes. Some of them even have the 11pt size. To save TEX's memory we can delete some of the sizes and typefaces we do not use normally.

To display the action of our 19 font changing macros, a sample text has been typeset 19 times but in different fonts. The fonts/font families called by our macros have almost all the glyphs contained in the Computer Modern family. In general, these fonts have more glyphs than Computer Modern. To see all the glyphs in a font, please use Werner Lemberg's fontchart utility. In a very few cases, e.g. in Epigrafica normal font (epigrafican8r), some important glyphs like Γ and Θ are missing. Our macro takes care of this; the user need not bother unless something very unusual is demanded from TEX. These minor issues arise with LATEX packages too.

Usage

Suppose we would like to typeset our TEX document in Charter font. To do this we have to copy the TEX macro file "font_charter.tex" to the directory (folder) which contains our TEX source file. In our TEX source file, we have to type `\input font_charter`. This will change the font to

[1] Typographically, the correct expression is, "TEX typesets documents in Computer Modern typefaces by default." But most people (including me) use the words *font* and *typeface* synonymously. In this manual such distinction has been avoided.

Charter from the point where the statement `\input font_charter` was declared. We can declare `\input font_charter` in a closed group (`{\input font_charter ... }`) to change the font to Charter in that group, provided no other font change is called in that group or its sub-group.

Another way to use the font changing macro files is to put them in a folder (say "fonts") in some drive (say "C") and then call these files in our TEX source file. If we want to use the Charter font, we should type `\input C:/fonts/font_charter` to get the desired change. If we have put the font changing macro files in a folder that has space(s) in its name (say "font change"), then we should type `\input "C:/font change/font_charter"` to use the Charter font.

The complete change of font will be at the default size in TEX (10pt), though a little manipulation with the macro file will enable us to get complete (text and math) smaller and larger point changes.

The basic typeface changing TEX control statements

`\rm` ... roman
`\it` ... *italic*
`\bf` ... **boldface**
`\sl` ... *slanted*
`\tt` ... `typewriter`

hold their usual meaning. All the macro files that this PDF mentions have the above mentioned five options. In addition, most macro files have other useful options too. These are:

`\itbf` ... ***italic boldface***
`\slbf` ... ***slanted boldface***
`\caps` ... CAPS
`\capsbf` ... **CAPS IN BOLDFACE**

In the *text mode*, the above mentioned typefaces can be used at 5, 6, 7, 8, 9, 10, 12, 14, 16, 18, and 20pt sizes. This is done by typing the size in words between the backslash (\) and the words that declare the typeface. For example, if we want to typeset some text in bold at 14pt then we have to use the control statement `\fourteenbf`.

Example

A sample TEX source file as shown below:

```
\parindent=0pt
\input font_cm
This is the {\bf Computer Modern font}. The {\twelveslbf Gamma function\/}
is defined as:
$$\Gamma(z) \equiv \int_0^\infty t^{z-1} e^{-t} dt.$$

\input font_charter
This is the {\bf Charter font}. The {\twelveslbf Gamma function\/}
is defined as:
$$\Gamma(z) \equiv \int_0^\infty t^{z-1} e^{-t} dt.$$

{ % begin group
\input font_century
This is the {\bf New Century Schoolbook font}. The {\twelveslbf Gamma
function\/} is defined as:
$$\Gamma(z) \equiv \int_0^\infty t^{z-1} e^{-t} dt.$$
} % end group

Now we are back to Charter.
```

after compilation will produce:

This is the **Computer Modern font**. The ***Gamma function*** is defined as:

$$\Gamma(z) \equiv \int_0^\infty t^{z-1} e^{-t} dt.$$

This is the **Charter font**. The ***Gamma function*** is defined as:

$$\Gamma(z) \equiv \int_0^\infty t^{z-1} e^{-t} dt.$$

This is the **New Century font**. The ***Gamma function*** is defined as:

$$\Gamma(z) \equiv \int_0^\infty t^{z-1} e^{-t} dt.$$

Now we are back to Charter.

Warning

The fonts used in these 19 macros are included in MikTeX and TEX Live distributions. All these macros should work smoothly with a full installation of MikTeX (Version 2.7 originally tested). Most of the macros should work smoothly with TEX Live but even after installing a full version of TEX Live on Ubuntu 9.04 it was found that some of the fonts had to be manually configured.

Three macros that include fonts from the cc-pl package did not work with pdfTEX, though a PDF file could be generated from the DVI file using dvipdfm. These 19 font changing macros have worked successfully with plain TEX, and a combination of plain TEX and other macros designed for plain TEX, e.g. $\mathcal{AMS}$-TEX and eplain.

If we are typesetting our document in English with any mathematics, then using these macros would be trouble free. They might demur when we try to type letters like ł, esp. when using typefaces like ***slanted boldface*** and CAPS. This is due to font encoding. In the present font (Charter, normal roman, mdbchr7t), `\l` produces ł, `{\slbf \l}` produces ***ł***, but `{\caps\l}` produces ␣L.

Sans-serif fonts do not have *italics*—they only have *slanted* ligatures. To make the font changing macro files more consistent, both italics and slanted commands, e.g. `\it` and `\sl`, produce *slanted* ligatures in case of sans-serif fonts and in those fonts that do not have distinct italic and slanted ligatures. Names of the fonts used in a macro and the available typefaces are listed in this document.

Charter

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Charter font is declared by typing `\input font_charter`. The font family uses fonts from the mdbch family, which corresponds to Bitstream Charter text fonts. This family is a part of Paul Pichaureau's MathDesign project. The Charter font was originally designed by Matthew Carter for Bitstream Inc. in 1987. Details of this TEX macro are given in the table below.

Font assignment in **font_charter** macro

Typeface	Font name	Typeface	Font name
Roman text	mdbchr7t	**Boldface text**	mdbchb7t
Math italic	mdbchri7m	`Typewriter text`	qx-lmtt10
Math symbols	md-chr7y	***Italic boldface text***	mdbchbi7t
Math extension	mdbchr7v	***Slanted boldface text***	mdbchbo7t
Italic text	mdbchri7t	CAPS	mdbchrfc8t
Slanted text	mdbchro7t	**CAPS IN BOLDFACE**	mdbchbfc8t

Utopia

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Utopia font is declared by typing `\input font_utopia`. The font family uses most of its fonts from the mdput family, which corresponds to Adobe Utopia text fonts. This family is a part of Paul Pichaureau's MathDesign project. The font family is very complete and includes the math fonts too. For inter-letter spacing reasons, macro font_utopia.tex uses math italic font and math symbols font from Michel Bovani's fourier package. The Utopia font was originally designed by Robert Slimbach for Adobe in 1989.

Math italic (mdputri7m) and math symbols (md-utr7y) from the mdput family can also be used. Details of this TEX macro are given in the table below.

Font assignment in **font_utopia** macro

Typeface	Font name	Typeface	Font name
Roman text	mdputr7t	**Boldface text**	mdputb7t
Math italic	futmii	`Typewriter text`	qx-lmtt10
Math symbols	futsy	***Italic boldface text***	mdputbi7t
Math extension	mdputr7v	***Slanted boldface text***	mdputbo7t
Italic text	mdputri7t	CAPS	mdputrfc8t
Slanted text	mdputro7t	CAPS IN BOLDFACE	mdputbfc8t

New Century Schoolbook

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\,dz = 0$$

for any closed contour γ completely contained in R.

The New Century Schoolbook font is declared by typing `\input font_century`. The font family uses fonts from the TeX Gyre Schola family, which corresponds to Adobe New Century Schoolbook text fonts. The Century Schoolbook font was created by Morris Fuller Benton between 1918 and 1921.

The macro uses math italic (fncmii) and math symbols (fncsy) from Michael Zedler's fouriernc package. Details of this TEX macro are given in the table below.

Font assignment in **font_century** macro

Typeface	Font name	Typeface	Font name
Roman text	cs-qcsr	**Boldface text**	cs-qcsb
Math italic	fncmii	`Typewriter text`	qx-lmtt10
Math symbols	fncsy	***Italic boldface text***	cs-qsbi
Math extension	cmex10	***Slanted boldface text***	pncbo7t
Italic text	cs-qcsri	Caps	cs-qcsr-sc
Slanted text	pncro7t	**Caps in Boldface**	cs-qcsb-sc

Palatino

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Palatino font is declared by typing `\input font_palatino`. The font family uses fonts from Young Ryu's pxfonts package, which corresponds to Adobe Palatino text fonts. The Palatino font was originally designed by Hermann Zapf for the Stempel foundry in 1950. Details of this TEX macro are given in the table below.

Font assignment in **font_palatino** macro

Typeface	Font name	Typeface	Font name
Roman text	pxr	**Boldface text**	pxb
Math italic	pxmi	`Typewriter text`	qx-lmtt10
Math symbols	pxsy	***Italic boldface text***	pxbi
Math extension	pxex	***Slanted boldface text***	pxbsl
Italic text	pxi	Caps	pxsc
Slanted text	pxsl	**Caps in Boldface**	pxbsc

Times

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Times font is declared by typing `\input font_times`. The font family uses fonts from Young Ryu's txfonts package, which corresponds to Adobe Times text fonts. The Times font was designed in 1931 by Stanley Morison at Monotype Corp. Details of this TEX macro are given in the table below.

Font assignment in **font_times** macro

Typeface	Font name	Typeface	Font name
Roman text	txr	**Boldface text**	txb
Math italic	txmi	`Typewriter text`	qx-lmtt10
Math symbols	txsy	***Italic boldface text***	txbi
Math extension	txex	***Slanted boldface text***	txbsl
Italic text	txi	Caps	txsc
Slanted text	txsl	**Caps in Boldface**	txbsc

Bookman Font

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\imath x} = \cos(x) + \imath \sin(x),$$

where $\imath$ is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\imath x} &= \sum_{n=0}^{\infty} \frac{(\imath x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \imath \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \imath \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Bookman font is declared by typing `\input font_bookman`. The font family uses fonts from Jackowski and Nowacki's (TEX Gyre) bonum family, Antonis Tsolomitis' kerkis package, and Young Ryu's txfonts package—all of them correspond to Adobe Bookman text fonts. The Bookman font was originally designed by Alexander Phemister in 1860 for the Miller & Richard foundry in Scotland. Details of this TEX macro are given in the table below.

Font assignment in **font_bookman** macro

Typeface	Font name	Typeface	Font name
Roman text	cs-qbkr	**Boldface text**	cs-qbkb
Math italic	kmath8r	`Typewriter text`	qx-lmtt10
Math symbols	txsy	***Italic boldface text***	cs-qbkbi
Math extension	txex	***Slanted boldface text***	pbkdo7t
Italic text	cs-qbkri	Caps	cs-qbkr-sc
Slanted text	pbklo7t	**Caps in Boldface**	cs-qbkb-sc

Antykwa Toruńska

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\imath x} = \cos(x) + \imath \sin(x),$$

where $\imath$ is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\imath x} &= \sum_{n=0}^{\infty} \frac{(\imath x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \imath \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \imath \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Antykwa Toruńska font is declared by typing `\input font_antt`. The font family uses fonts from J. M. Nowacki's antt package, which corresponds to Zygfryd Gardzielewski's Antykwa Toruńska text fonts. Zygfryd Gardzielewski designed Antykwa Toruńska in 1960 for Grafmasz typefoundry in Warsaw. Details of this TEX macro are given in the table below.

Font assignment in **font_antt** macro

Typeface	Font name	Typeface	Font name
Roman text	cs-anttr	**Boldface text**	cs-anttb
Math italic	mi-anttri	`Typewriter text`	qx-lmtt10
Math symbols	sy-anttrz	***Italic boldface text***	cs-anttbi
Math extension	ex-anttr	***Slanted boldface text***	cs-anttbi
Italic text	cs-anttri	Caps	cs-anttrcap
Slanted text	cs-anttri	**Caps in Boldface**	cs-anttbcap

Iwona

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Iwona font is declared by typing `\input font_iwona`. The font family uses fonts from J. M. Nowacki's iwona package, which corresponds to Malgorzata Budyta's text fonts. Details of this TEX macro are given in the table below.

Font assignment in **font_iwona** macro

Typeface	Font name	Typeface	Font name
Roman text	cs-iwonar	**Boldface text**	cs-iwonab
Math italic	mi-iwonari	`Typewriter text`	qx-lmtt10
Math symbols	sy-iwonarz	***Italic boldface text***	cs-iwonabi
Math extension	ex-iwonar	***Slanted boldface text***	cs-iwonabi
Italic text	cs-iwonari	Caps	cs-iwonarcap
Slanted text	cs-iwonari	**Caps in Boldface**	cs-iwonabcap

Kurier

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Kurier font is declared by typing `\input font_kurier`. The font family uses fonts from J. M. Nowacki's kurier package, which corresponds to Malgorzata Budyta's text fonts. The Kurier font is very similar to Iwona font; Kurier is a bit extended. Details of this TEX macro are given in the table below.

Font assignment in **font_kurier** macro

Typeface	Font name	Typeface	Font name
Roman text	cs-kurierr	**Boldface text**	cs-kurierb
Math italic	mi-kurierri	`Typewriter text`	qx-lmtt10
Math symbols	sy-kurierrz	***Italic boldface text***	cs-kurierbi
Math extension	ex-kurierr	***Slanted boldface text***	cs-kurierbi
Italic text	cs-kurierri	Caps	cs-kurierrcap
Slanted text	cs-kurierri	**Caps in Boldface**	cs-kurierbcap

Arev

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Arev font is declared by typing `\input font_arev`. The font family uses fonts from S. G. Hartke's arev package, which corresponds to Bitstream Vera Sans text fonts. Bitstream Vera font was designed by Jim Lyles. Details of this TEX macro are given in the table below.

Font assignment in **font_arev** macro

Typeface	Font name	Typeface	Font name
Roman text	zavmr7t	**Boldface text**	zavmb7t
Math italic	zavmri7m	`Typewriter text`	qx-lmtt10
Math symbols	zavmr7y	***Italic boldface text***	favbi8t
Math extension	ex-kurierr	***Slanted boldface text***	favbi8t
Italic text	favri8t	No caps	---
Slanted text	favri8t	No caps in bold	---

Computer Modern Bright

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

The Computer Modern Bright font is declared by typing `\input font_cmbright`. The font family uses fonts from Walter Schmidt's cmbright package, which corresponds to Donald Knuth's Computer Modern Sans Serif text fonts. Computer Modern Bright fonts are lighter than Knuth's Computer Modern Sans Serif fonts. Details of this TEX macro are given in the table below.

Font assignment in **font_cmbright** macro

Typeface	Font name	Typeface	Font name
Roman text	cmbr10	**Boldface text**	cmbrbx10
Math italic	cmbrmi10	`Typewriter text`	qx-lmtt10
Math symbols	cmbrsy10	***Italic boldface text***	cs-lmssbo10
Math extension	ex-iwonar	***Slanted boldface text***	cs-lmssbo10
Italic text	cmbrsl10	No caps	—
Slanted text	cmbrsl10	No caps in bold	—

Epigrafica with Euler

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

This macro enables us to type text in Epigrafica font and math in Euler font. The macro is declared by typing `\input font_epigrafica_euler`. The macro typesets text in fonts from Antonis Tsolomitis's epigrafica package (based on Hermann Zapf's Optima text font) and math in Walter Schmidt's Euler-VM fonts (based on Hermann Zapf's Euler and Knuth's CM fonts). Details of this TEX macro are given in the table below.

Font assignment in **font_epigrafica_euler** macro

Typeface	Font name	Typeface	Font name
Roman text	epigrafican8r	**Boldface text**	epigraficab8r
Math italic	eurm10	`Typewriter text`	qx-lmtt10
Math symbols	cmsy10	***Italic boldface text***	epigraficabi8r
Math extension	euex10	***Slanted boldface text***	epigraficabi8r
Italic text	epigraficai8r	Caps	epigraficac8r
Slanted text	epigraficai8r	No caps in bold	–

Epigrafica with Palatino

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

This macro enables us to type text in Epigrafica font and math in PX Fonts. The macro is declared by typing `\input font_epigrafica_palatino`. The macro typesets text in fonts from Antonis Tsolomitis's epigrafica package (based on Hermann Zapf's Optima text font) and math in Young Ryu's pxfonts package (which corresponds to Adobe Palatino text fonts). Details of this TEX macro are given in the table below.

Font assignment in **font_epigrafica_palatino** macro

Typeface	Font name	Typeface	Font name
Roman text	epigrafican8r	**Boldface text**	epigraficab8r
Math italic	pxmi	`Typewriter text`	qx-lmtt10
Math symbols	pxsy	***Italic boldface text***	epigraficabi8r
Math extension	pxex	***Slanted boldface text***	epigraficabi8r
Italic text	epigraficai8r	Caps	epigraficac8r
Slanted text	epigraficai8r	No caps in bold	–

Antykwa Półtawskiego with Euler

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

This macro enables us to type text in Antykwa Półtawskiego font and math in Euler font. The macro is declared by typing `\input font_antp_euler`. The macro typesets text in fonts from J. M. Nowacki's antp package (based on Polish typographer, Adam Półtawski's Antykwa Półtawskiego text fonts) and math in Walter Schmidt's Euler-VM fonts (based on Hermann Zapf's Euler and Knuth's CM fonts). Details of this TEX macro are given in the table below.

Font assignment in **font_antp_euler** macro

Typeface	Font name	Typeface	Font name
Roman text	antpr	**Boldface text**	antpb
Math italic	eurm10	`Typewriter text`	qx-lmtt10
Math symbols	cmsy10	***Italic boldface text***	antpbi
Math extension	euex10	***Slanted boldface text***	antpbi
Italic text	antpri	No caps	—
Slanted text	antpri	No caps in bold	—

Bera Serif with Concrete

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

This macro enables us to type text in Bera serif and math in Concrete. The macro is declared by typing `\input font_bera_concrete`. The macro typesets text in Bera serif fonts from Walter Schmidt's bera package (based on Bitstream Vera serif font designed by Jim Lyles of Bitstream Inc.) and math is typeset using in Jackowski, Ryćko and Bzyl's cc-pl package (based on Knuth's Concrete Roman fonts). Details of this TEX macro are given in the table below.

Font assignment in **font_bera_concrete** macro

Typeface	Font name	Typeface	Font name
Roman text	fver8t	**Boldface text**	fveb8t
Math italic	pcmi10	`Typewriter text`	qx-lmtt10
Math symbols	cmsy10	***Italic boldface text***	fvebo8t
Math extension	cmex10	***Slanted boldface text***	fvebo8t
Italic text	fvero8t	No caps	—
Slanted text	fvero8t	No caps in bold	—

Bera Serif with Euler

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

This macro enables us to type text in Bera serif and math in Euler. The macro is declared by typing `\input font_bera_euler`. The macro typesets text in Bera serif fonts from Walter Schmidt's bera package (based on Bitstream Vera serif font designed by Jim Lyles of Bitstream Inc.) and math in Walter Schmidt's Euler-VM fonts (based on Hermann Zapf's Euler and Knuth's CM fonts). Details of this TEX macro are given in the table below.

Font assignment in **font_bera_euler** macro

Typeface	Font name	Typeface	Font name
Roman text	fver8t	**Boldface text**	fveb8t
Math italic	eurm10	`Typewriter text`	qx-lmtt10
Math symbols	cmsy10	***Italic boldface text***	fvebo8t
Math extension	euex10	***Slanted boldface text***	fvebo8t
Italic text	fvero8t	No caps	—
Slanted text	fvero8t	No caps in bold	—

Bera Serif with Fouriernc

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\imath x} = \cos(x) + \imath \sin(x),$$

where $\imath$ is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\imath x} &= \sum_{n=0}^{\infty} \frac{(\imath x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \imath \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \imath \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

This macro enables us to type text in Bera serif and math in Fouriernc (originally used with New Century). The macro is declared by typing `\input font_bera_fnc`. The macro typesets text in Bera serif fonts from Walter Schmidt's bera package (based on Bitstream Vera serif font designed by Jim Lyles of Bitstream Inc.) and math using in Michael Zedler's fouriernc package. Details of this TEX macro are given in the table below.

Font assignment in **font_bera_fnc** macro

Typeface	Font name	Typeface	Font name
Roman text	fver8t	**Boldface text**	fveb8t
Math italic	fncmii	`Typewriter text`	qx-lmtt10
Math symbols	fncsy	***Italic boldface text***	fvebo8t
Math extension	cmex10	***Slanted boldface text***	fvebo8t
Italic text	fvero8t	No caps	—
Slanted text	fvero8t	No caps in bold	—

Concrete

Euler Formula: The Euler formula, also known as Euler identity, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

This macro enables us to type text and math in Donald Knuth's Concrete fonts. The macro is declared by typing `\input font_concrete`. The macro uses Jackowski, Ryćko and Bzyl's cc-pl package which is based on Knuth's Concrete Roman fonts. Details of this TEX macro are given in the table below.

Font assignment in font_concrete macro

Typeface	Font name	Typeface	Font name
Roman text	pcr10	No boldface text	—
Math italic	pcmi10	`Typewriter text`	qx-lmtt10
Math symbols	cmsy10	No italic boldface text	—
Math extension	cmex10	No slanted boldface text	—
Italic text	pcti10	CAPS	pccsc10
Slanted text	pcsl10	No caps in bold	—

Computer Modern

Euler Formula: The Euler formula, also known as **Euler identity**, states

$$e^{\iota x} = \cos(x) + \iota \sin(x),$$

where ι is the *imaginary unit*.

The Euler formula can be expanded as a series:

$$\begin{aligned} e^{\iota x} &= \sum_{n=0}^{\infty} \frac{(\iota x)^n}{n!} \\ &= \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} + \iota \sum_{1}^{\infty} \frac{(-1)^{n-1} x^{2n-1}}{(2n-1)!} \\ &= \cos(x) + \iota \sin(x). \end{aligned}$$

Cauchy Integral Theorem: If $f(z)$ is analytic and its partial derivatives are continuous throughout some simply connected region R, then

$$\oint_{\gamma} f(z)\, dz = 0$$

for any closed contour γ completely contained in R.

This macro enables us to type text in Computer Modern font (serif). Though TEX typesets documents in Donald Knuth's Computer Modern fonts by default, this macro is being supplied so that the user can use the different sizes as discussed in this document and in case the main font of any TEX document is other than Computer Modern then by using this macro we can set the font to Computer Modern in some group. The macro is declared by typing `\input font_cm`. Details of this TEX macro are given in the table below.

Font assignment in **font_cm** macro

Typeface	Font name	Typeface	Font name
Roman text	cmr10	**Boldface text**	cmbx10
Math italic	cmmi10	`Typewriter text`	cmtt10
Math symbols	cmsy10	***Italic boldface text***	cmbxti10
Math extension	cmex10	***Slanted boldface text***	cmbxsl10
Italic text	cmti10	Caps	cmcsc10
Slanted text	cmsl10	No caps in Boldface	—

Typefaces and Sizes

Given below are various typefaces and sizes that our macros offer.

Roman

This text is in 20pt size.
This text is in 18pt size.
This text is in 16pt size.
This text is in 14pt size.
This text is in 12pt size.
This text is in 10pt size.
This text is in 9pt size.
This text is in 8pt size.
This text is in 7pt size.
This text is in 6pt size.
This text is in 5pt size.

Italic

This text is in 20pt size.
This text is in 18pt size.
This text is in 16pt size.
This text is in 14pt size.
This text is in 12pt size.
This text is in 10pt size.
This text is in 9pt size.
This text is in 8pt size.
This text is in 7pt size.
This text is in 6pt size.
This text is in 5pt size.

Slanted

This text is in 20pt size.
This text is in 18pt size.
This text is in 16pt size.
This text is in 14pt size.
This text is in 12pt size.
This text is in 10pt size.
This text is in 9pt size.
This text is in 8pt size.
This text is in 7pt size.
This text is in 6pt size.
This text is in 5pt size.

Boldface

This text is in 20pt size.
This text is in 18pt size.
This text is in 16pt size.
This text is in 14pt size.
This text is in 12pt size.
This text is in 10pt size.
This text is in 9pt size.
This text is in 8pt size.
This text is in 7pt size.
This text is in 6pt size.
This text is in 5pt size.

Italic boldface

This text is in 20pt size.
This text is in 18pt size.
This text is in 16pt size.
This text is in 14pt size.
This text is in 12pt size.
This text is in 10pt size.
This text is in 9pt size.
This text is in 8pt size.
This text is in 7pt size.
This text is in 6pt size.
This text is in 5pt size.

Slanted boldface

This text is in 20pt size.
This text is in 18pt size.
This text is in 16pt size.
This text is in 14pt size.
This text is in 12pt size.
This is 10 pt slanted boldface.
This text is in 9pt size.
This text is in 8pt size.
This text is in 7pt size.
This text is in 6pt size.
This text is in 5pt size.

Caps

THIS TEXT IS IN 20PT SIZE.
THIS TEXT IS IN 18PT SIZE.
THIS TEXT IS IN 16PT SIZE.
THIS TEXT IS IN 14PT SIZE.
THIS TEXT IS IN 12PT SIZE.

This text is in 10pt size.

This text is in 9pt size.

This text is in 8pt size.

This text is in 7pt size.

This text is in 6pt size.

This text is in 5pt size.

Caps in boldface

This text is in 20pt size.
This text is in 18pt size.
This text is in 16pt size.
This text is in 14pt size.
This text is in 12pt size.
This text is in 10pt size.

This text is in 9pt size.

This text is in 8pt size.

This text is in 7pt size.

This text is in 6pt size.

This text is in 5pt size.

Inter-Line and Inter-Word Spacing

If we change the text font in TEX, the inter-line and inter-word spacing is not changed accordingly. This is not such a problem if we declare the new font at the same size as the preceding one. But if the new font is declared at a considerably larger or smaller size, the typesetting might not be aesthetically elegant.

Example

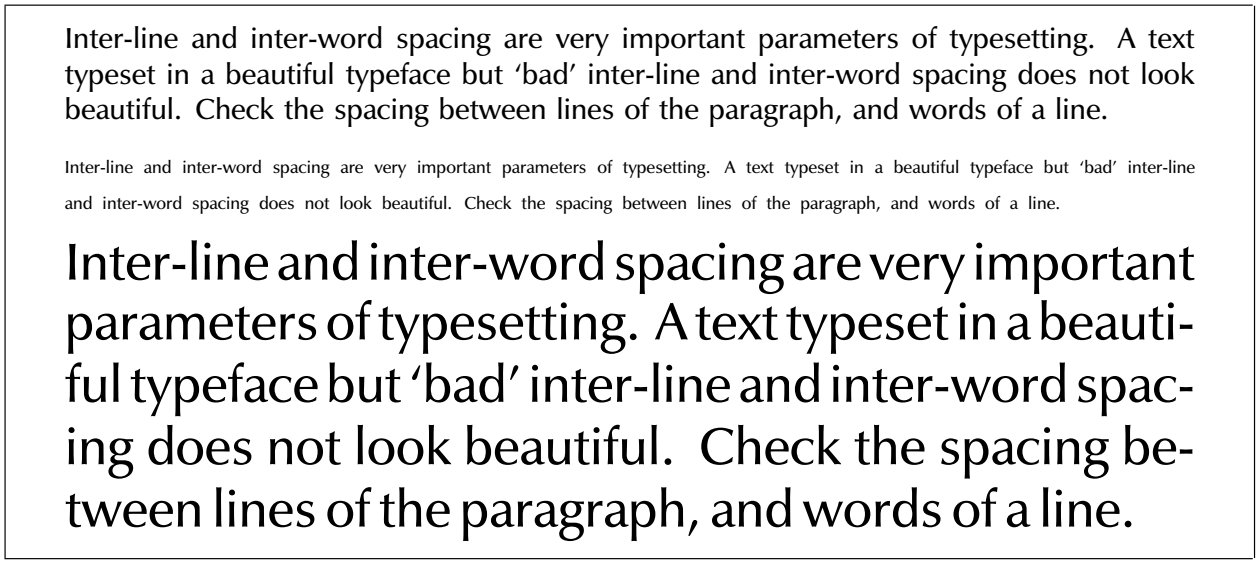
A sample TEX source file as shown below:

```
\parindent=0pt
\input font_epigrafica_euler % the font size is 10pt
Inter-line and inter-word spacing are very important parameters of
typesetting. A text typeset in a beautiful typeface but ‘bad’
inter-line and inter-word spacing does not look beautiful. Check
the spacing between lines of the paragraph, and words of a line.
\medskip

\sixrm % changes the font size to 6pt
Inter-line and inter-word spacing are very important parameters of
typesetting. A text typeset in a beautiful typeface but ‘bad’
inter-line and inter-word spacing does not look beautiful. Check
the spacing between lines of the paragraph, and words of a line.
\medskip

\eighteenrm % changes the font size to 18pt
Inter-line and inter-word spacing are very important parameters of
typesetting. A text typeset in a beautiful typeface but ‘bad’
inter-line and inter-word spacing does not look beautiful. Check
the spacing between lines of the paragraph, and words of a line.
```

after compilation should produce something like this:



In the output we can notice that the inter-line and inter-word spacing is quite fine when the font size is 10pt. The inter-line space is too much in the 6pt text (the lines are far apart) and the inter-word space is less in the 18pt text (the words are too close). This is because TEX is still working according to the default space values, which are declared for 10pt font size. To tackle this, TEX offers two very useful primitive control statements ([1], pp. 76, 78). These are:

`\spaceskip` to control the inter-word space,
`\baselineskip` to control the inter-line space.

An Easy Solution

Here I am stating a technique I use to counter spacing problems when using different fonts and at different sizes. Let us make a new definition called `\fontss`.

```
\def\fontss{\baselineskip=2.8ex plus0pt minus0pt
            \spaceskip=0.333333em plus0.144444em minus0.0999999em}
```

The units, *ex* and *em* are relative ([1], pp. 60). This makes our definition more general.

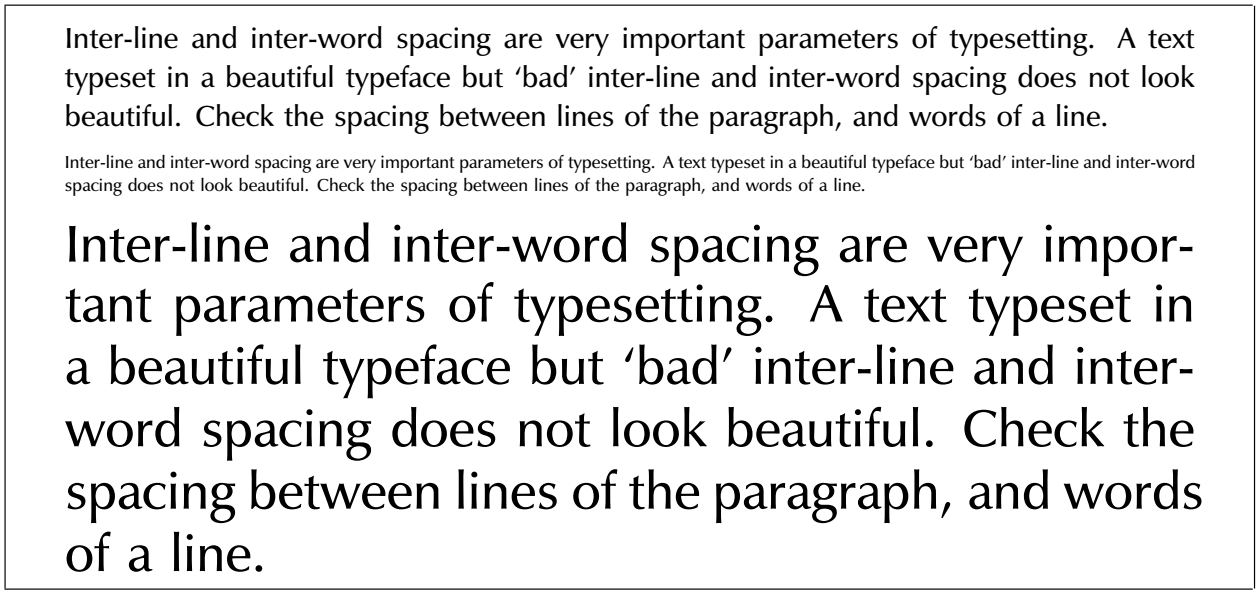
em is the width of a "quad" in the current font,
ex is the "x-height" of the current font.

Declaring `\fontss` would set our inter-line space to 2.8ex (= 12.05553pt in case of font cmr10 at 10pt) with no *stretchability* (given after *plus*) or *shrinkability* (given after *minus*). Also `\fontss` would set our inter-word space to 0.333333em, with 0.144444em of stretchability and 0.0999999em of shrinkability allowed. In case of font cmr10, these values (default) are 3.33333pt, 1.66666pt, and 1.11111pt, respectively.

Let us try to use `\fontss` in the example given at the beginning of this chapter. A sample TEX source file as shown below:

```
\parindent=0pt
\input font_epigrafica_euler % the font size is 10pt
\fontss % \baselineskip and \spaceskip are set accordingly
Inter-line and inter-word spacing are very important parameters of
typesetting. A text typeset in a beautiful typeface but 'bad'
inter-line and inter-word spacing does not look beautiful. Check
the spacing between lines of the paragraph, and words of a line.
\medskip
\sixrm % changes the font size to 6pt
\fontss % \baselineskip and \spaceskip are set accordingly
Inter-line and inter-word spacing are very important parameters of
typesetting. A text typeset in a beautiful typeface but 'bad'
inter-line and inter-word spacing does not look beautiful. Check
the spacing between lines of the paragraph, and words of a line.
\medskip
\eighteenrm % changes the font size to 18pt
\fontss % \baselineskip and \spaceskip are set accordingly
Inter-line and inter-word spacing are very important parameters of
typesetting. A text typeset in a beautiful typeface but 'bad'
inter-line and inter-word spacing does not look beautiful. Check
the spacing between lines of the paragraph, and words of a line.
```

after compilation should produce something like this:



By using the control primitives `\spaceskip` and `\baselineskip` we get the desired spacing and these can be declared almost anywhere. For more details on spacing, please refer to [1].

Acknowledgements

I wholeheartedly thank Donald E. Knuth for giving us TEX—the best typesetting program till date, which has succeeded the test of time. Also, I am grateful to dear TEX users who have contributed to make TEX better by giving more freedom to its free feature. The designers of fonts and packages that I have used are a few of those dear TEX users. I am grateful to Petr Habala for introducing me to TEX. I thank Daphne Parramon for her comments on my work. I am beholden to my family for their indispensable love and support. There are so many factors that I am not able to take into account that in the end but above all, I say, "Thank you ॐ."

References[2]

[1] D. E. Knuth, *The TEXbook*. Reading, Mass.: Addison-Wesley Pub. Co., 1986.

[2] P. Habala, *How to Use AMS-TEX*, [Online]. Available: http://math.feld.cvut.cz/habala/manuals/manams.pdf [Accessed: August 16, 2009].

[3] S. G. Hartke, "A survey of free math fonts for TEX and LATEX," 2006. [Online]. Available: http://ftp.cvut.cz/tex-archive/info/Free_Math_Font_Survey/en/survey.pdf [Accessed: August 16, 2009].

[2] The reader has been referred to most of the references (they have not been listed on this page) via hyperlinks provided in this PDF document.