The St Mary’s Road symbol font

Jeremy Gibbons Alan Jeffrey (and temporarily Chris Rowley)

Version 2.02a-tmp-CAR, March 2004

1 Introduction

This is a brief guide to the St Mary’s Road symbol font, a new symbol font for \TeX and \LaTeX. It is designed to live with the American Mathematical Society’s fonts, contained in \texttt{amssymb.sty}.

It provides a number of new symbols, including ones for derivation of functional programming (such as $\gamma$, $\pm$ and $\wedge$), process algebra ($\llbracket$, $\Box$ and $\Diamond$), domain theory ($\sqcap$), linear logic ($\&$ and $\nabla$), multisets ($\{x\}$, $\in$ and $\notin$) and many more. It also fixes some ‘features’ with previous symbols ($\oplus$ used not to be circular, now you can use $\varoplus$ instead) and adds obvious variants of others (such as $\leftarrow$, $\Rightarrow$ and $\Leftarrow$).

It is all wrapped up in a \LaTeX2ε package called \texttt{stmaryrd}, which can be used by saying:

\begin{verbatim}
\usepackage{stmaryrd}
\end{verbatim}

This package understands a large number of options:

- \texttt{heavycircles} says that all of the circular operators such as \texttt{\oplus} and \texttt{\otimes} should by default be heavy, and that \texttt{\varoplus} and \texttt{\varotimes} should refer to the light ones.

- \texttt{only} says that only the symbols listed in the option list should be defined. For example:

\begin{verbatim}
\usepackage[only,mapsfrom,Mapsto,Mapsfrom]{stmaryrd}
\end{verbatim}

says that only the symbols ‘$\leftarrow$', ‘$\Rightarrow$’ and ‘$\Leftarrow$’ should be defined, which is useful if you use a \TeX implementation with limited memory.

2 Symbols

The following operators are defined:

\begin{verbatim}
\Ydown \Yup \Yleft \Yright
\Yleftbar
\binampersand \bindnasrepma
\boxbar \boxdot \boxempty
\end{verbatim}
If the \texttt{amssymb} package has been loaded then the following are also defined: \texttt{\oast} and \texttt{\ocircle}. The following large operators are defined:

\begin{verbatim}
\bigbox \bigcurlyvee \bigcurlywedge
\biginterleave \bignplus \bigparallel
\bigsqcap \bigtriangledown \bigtriangleup
\end{verbatim}

The following relations are defined:

\begin{verbatim}
\inplus \niplus \ntrianglelefteqslant \subsetplus \subsetpluseq \trianglelefteqslant \trianglerighteqslant
\ntrianglerighteqslant \trianglelefteqslant
\end{verbatim}

The following arrows are defined:

\begin{verbatim}
\Longmapsfrom \Longmapsto \Mapsfrom \Longmapstoq
\Mapsfrom \nmapstom
\nmapstoq \nmapstoq \nmapstoq \nmapstoq \nmapstoq \nmapstoq \nmapstoq
\end{verbatim}

The following delimiters are defined:

\begin{verbatim}
\Lbag \Rbag \lbag \rrbracket \rrceil \rrfloor
\llbracket \llceil \llfloor
\end{verbatim}

Note that \texttt{\llbracket} and \texttt{\rrbracket} are ‘growing’ delimiters that can be used with \texttt{\left} and \texttt{\right}:

\[
[P] \begin{bmatrix} a \oplus b \end{bmatrix} \begin{bmatrix} a \\ b \\ c \end{bmatrix} \begin{bmatrix} a \\ b \\ c \\ d \\ e \\ f \end{bmatrix}
\]
The following special characters are used in building others:

\arrownot \Rightarrow
\arrownot \rightarrowtriangle

For example, if you type $\Arrownot \Rightarrow$ you get $\Rightarrow$, and if you type $\arrownot \rightarrowtriangle$ you get $\rightarrowtriangle$.

Acknowledgements

Thanks to David Murphy for suggestions in the design of the St Mary’s Road font. Thanks to Martin Ward for the first pass of converting the stmaryrd package to \LaTeX{}\epsilon. Thanks to Simon Mercer for all the wine at 45 St. Mary’s Road.

Legal rubbish

This document is copyright © 1991–1994 Alan Jeffrey. The St Mary’s Road fonts are copyright © 1991–1994 Jeremy Gibbons and Alan Jeffrey. All rights are reserved. The moral right of the authors has been asserted.

This package may be distributed under the terms of the LaTeX Project Public License, as described in lppl.txt in the base \LaTeX{} distribution. Either version 1.0 or, at your option, any later version.

3 Installation

To begin with, the stmaryrd package is installed by running \LaTeX{}\epsilon on this document, so we begin with the installation procedure. This needs to use \LaTeX{}\epsilon:

\begin{filecontents}{stmaryrd.ins}
\generateFile{stmaryrd.sty}{f}{\from{stmaryrd.dtx}{package}}
\generateFile{Ustmry.fd}{f}{\from{stmaryrd.dtx}{fontdef}}
\end{filecontents}

Then we do some horrible low-level hacks to run docstrip on stmaryrd.ins:

\begin{verbatim}
\bgroup
\makeatletter
\let\@@end=\relax
\def\batchfile{stmaryrd.ins}
\input{docstrip}
\egroup
\end{verbatim}

That’s it for the installation:
4 Documentation

We now provide the documentation driver for this document:

\documentclass{ltxdoc}
\DisableCrossrefs
\OnlyDescription
\usepackage{stmaryrd}

Some hacks that are used in the documentation:
\def\symbols\flushleft
\def\endsymbols\endflushleft
\def\dosymbol#1{\leavevmode\hbox to .33\textwidth{\hbox to 1.2em{\hss$#1$\hfil}\footnotesize\tt\string#1\hss}\penalty10}
\def\test#1{\par\leavevmode\llap{#1\tt\string#1:}
\rlap{#1$\left\llbracket\bigbox_{i \inplus I}^{a \varoplus b} P_i$
\right\rrbracket$}}

Then we produce the documentation:
\begin{document}
\DocInput{stmaryrd.dtx}
\end{document}

5 The package

We can now implement the \texttt{stmaryrd} package.
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{stmaryrd}[1994/03/03 St Mary's Road symbol package]

Most definitions in this file are preceded by \texttt{stm@if}, which sets its second argument to be undefined, and expands to \texttt{\iftrue} if its second argument is going to be defined, for example:
\begin{verbatim}
\stm@if\def\foo{baz}\fi
\end{verbatim}

By default, this is always true.
\begin{verbatim}
\def\stm@if#1#2{\let#2=\@undefined\iftrue#1#2}
\end{verbatim}

The \texttt{only} option causes \texttt{stm@if} to be true only when its second argument is defined to be \texttt{\relax}.
\begin{verbatim}
\DeclareOption{only}{\stm@option{varotimes}\stm@option{varoast}}
\end{verbatim}

The \texttt{heavycircles} option makes sure all of the heavy circles are defined, and sets \texttt{stm@true}.
\begin{verbatim}
\DeclareOption{heavycircles}{%\stm@option{varotimes}\stm@option{varoast}}
\end{verbatim}
For every other option, we call \texttt{\stmry@option}, which defines its argument to be \texttt{relax}.

\begin{verbatim}
def\stmry@option#1:\expandafter\let\csname#1\endcsname\relax
\end{verbatim}

All of the other options for \texttt{stmaryrd} are command names. Some of the commands need others to be defined, so we declare these explicitly.

\begin{verbatim}
\DeclareOption{Mapsto}{\stmry@option{Mapsto}}
\DeclareOption{mapsfrom}{\stmry@option{mapsfrom}}
\DeclareOption{Mapsfrom}{\stmry@option{Mapsfrom}}
\DeclareOption{longarrownot}{\stmry@option{longarrownot}}
\DeclareOption{Longarrownot}{\stmry@option{Longarrownot}}
\DeclareOption{Longmapsto}{\stmry@option{Longmapsto}}
\end{verbatim}

Then we can process the options!

\begin{verbatim}
\ProcessOptions
\end{verbatim}

Declare the symbol fonts:

\begin{verbatim}
\DeclareSymbolFont{stmry}{U}{stmry}{m}{n}
\SetSymbolFont{stmry}{bold}{U}{stmry}{b}{n}
\end{verbatim}
Then we load those symbols!
The heavy ©:

\ifstmry@heavy@
\def\@swap#1#2{\let\@tempa#1\let#1#2\let#2\@tempa}
\@swap\varotimes\otimes
\@swap\varolessthan\olessthan
\@swap\varogreaterthan\ogreaterthan
\@swap\varovee\ovee
\@swap\varowedge\owedge
\@swap\varoast\oast
\@swap\varobar\obar
\@swap\varodot\odot
\@swap\varoslash\oslash
\@swap\varobslash\obslash
\@swap\varocircle\ocircle
\@swap\varoplus\oplus
\@swap\varominus\ominus
\@swap\varbigcirc\bigcirc
\@swap\varcopyright\copyright
\fi

\langle\package\rangle

\begin{verbatim}
6 The font definitions

The font definitions for the St Mary's Road fonts are:
\if stmry@heavy@
\else
\fi
\end{verbatim}

\textbf{6} The font definitions

The font definitions for the St Mary's Road fonts are:
{<5><6><7><8><9><10>gen * stmary
<10.95><12><14.4><17.28><20.74><24.88>stmary10%
}{}{/fontdef}