The **schedule** package*

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**Abstract**

A new environment, **schedule**, is defined. Primarily intended for constructing charts of recurring weekly appointments, the environment may also be used to create a schedule of events and sign-up sheets (for example, scheduling mandatory office visits with students for discussing paper topics, etc.)

This package requires the packages **calc** and **color**.

1 **Introduction**

**schedule** provides a simple interface for creating graphical charts displaying weekly appointments. Many respects of the overall layout can be customized to suit the user’s desires. Unless these default settings are changed, the created schedule will run from Monday to Friday, 8:00am to 5:00pm, and the only predefined command to insert appointments will be \texttt{\textbackslash class}, which draws the appointment using black text on a medium-gray background.

The main feature of the **schedule** package is its accuracy in diagramming the length of appointments. Unlike some professionally available schedule creation programs, the representation of the length of appointments in the **schedule** package is accurate to the minute. In other words, if you have two appointments, one running from 2:00pm to 3:30pm on Tuesday and another running from 2:00pm to 3:31pm on Wednesday, there is a visible difference between the two representations. Unfortunately, unless you have a high-resolution printer (by which I mean more than 600 dpi) these differences will likely only be noticeable by a on-screen previewing program like **ghostview**.

2 **Examples**

The following schedule is typeset using the commands:

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*This file has version number v1.00, last revised 1997/10/28.
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\begin{schedule}
\begin{tabular}{|c|c|c|c|c|}
\hline
\textbf{Time} & \textbf{Monday} & \textbf{Tuesday} & \textbf{Wednesday} & \textbf{Thursday} & \textbf{Friday} \\
\hline
12:00 am & Moral Philosophy & Math Logic & Departmental Meeting & Math Logic & Math Logic \\
12:30 pm & Critical Reasoning & Math Logic & Math Logic & Critical Reasoning & Critical Reasoning \\
1:00 pm & SSL 290 & Critical Reasoning & SSL 290 & Critical Reasoning & SSL 290 \\
1:30 pm & Critical Reasoning & SSL 290 & Critical Reasoning & SSL 290 & Critical Reasoning \\
2:00 pm & Moral Philosophy & Office Hours & Office Hours & Office Hours & Office Hours \\
2:30 pm & HOB 233 & HOB 210 & HOB 210 & HOB 210 & HOB 210 \\
3:00 pm & & & & & \\
\hline
\end{tabular}
\end{schedule}

This example demonstrates all of the user-customizable options. Note several “features” of the package:

1. Appointments falling outside of the specified time range for the schedule are automatically truncated to fit. If the appointment falls entirely outside of the time range, it is not printed at all.

2. The command \texttt{\\class} is predefined to chart appointments pertaining to class attendance. New appointment types may be defined by the user via the \texttt{\\NewAppointment} command. The new appointments may use any predefined color for the text or background. Note that the color package allows one to define new colors.

3. The boxes created to represent appointments are sized to be accurate to the minute. In other words, if you have two appointments, one 52 minutes long
and the other 53 minutes long, the box representing the second appointment will be slightly longer.

4. The schedule is typeset in a centered displayed environment.

3 User Commands

\CellHeight Including \CellHeight\{length\} before the schedule environment tells \LaTeX\ how high to make the cells in the schedule (all cells have the same height). Since a cell corresponds to an hour in the schedule, this command allows the user to specify how much vertical space a single hour ought to take up.

\CellWidth Including \CellWidth\{width\} before the schedule environment tells \LaTeX\ how wide to make every cell in the schedule. The overall width of the schedule is determined by multiplying this value by the number of days (set by the \FiveDay or \SevenDay command), plus the width of the time labels on the left-hand side.

\TimeRange This command must appear before the schedule environment, otherwise \LaTeX\ will not know how deep to make the grid. It is important to note that the time range is specified using a 24-hour format, with a single hyphen between the two times. Deviating from this format will generate an error.

\SubUnits The \SubUnits\{number\} tells the package how to subdivide the hour. If one does not want any subdivisions, simply use \SubUnits\{60\}. The value of \{number\} can be any number that evenly divides 60. It is assumed that, in specifying this value, you know what you are doing: i.e., if you tell \LaTeX\ to use a \CellHeight of 1in, but then set \SubUnits\{3\}, you will get 20 subdivisions (with times) in a cell only 1in high. In other words, the text on the left-hand side of the schedule will be typeset as a horrible mess. The solution is simple: if you want a large number of subdivisions, simply set \CellHeight to a greater value.

\BeginOn Including \BeginOn\{day\} tells \LaTeX\ what day of the week to start the schedule on. The possible values are ‘Sunday’, ‘Monday’, ‘Tuesday’, ‘Wednesday’, ‘Thursday’, ‘Friday’, or ‘Saturday’. My apologies for non-English speaking users of \LaTeX. If there is a demand for it, I will fix this in future releases.

\TextSize With the \TextSize\{font-size\} command, the user tells \LaTeX\ what size font to use when typesetting the text inside the boxes. This command ought to be one of the standard \LaTeX\ font-size commands, e.g., \tiny, \scriptsize, etc. Using two large of a font will almost always result in bad line breaks inside the boxes, though, due to the narrow width of a cell.

\FiveDay Tells \LaTeX\ to typeset a five-day schedule.

\SevenDay Tells \LaTeX\ to typeset a seven-day schedule.

\NewAppointment By using the \NewAppointment command, the user can customize the appearance of the schedule by changing the color of the text or the background color. The syntax is \NewAppointment\{appointment-name\}\{background-color\}\{text-color\}. 
4 The Macros

(*header)
\ProvidesFile{schedule.dtx}
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{schedule}
\RequirePackage{calc}
\RequirePackage{color}
(*package)
\definecolor{dark}{gray}{.75}
%
% CONSTANTS FOR THE WEEK
%
\def\@sunday{Su}
\def\@Sunday{Sunday}
\def\@monday{M}
\def\@Monday{Monday}
\def\@tuesday{T}
\def\@Tuesday{Tuesday}
\def\@wednesday{W}
\def\@Wednesday{Wednesday}
\def\@thursday{Th}
\def\@Thursday{Thursday}
\def\@friday{F}
\def\@Friday{Friday}
\def\@saturday{Sa}
\def\@Saturday{Saturday}
%
% COUNTERS, LENGTHS, ETC.
%
\newlength{\cell@height}
\setlength{\cell@height}{1in}
\newlength{\cell@width}
\setlength{\cell@width}{1in}
\newlength{\box@depth}
\newcounter{sch@col@width} \setcounter{sch@col@width}{60}
\newlength{\box@width}
\setlength{\box@width}{1in*(\value{sch@col@width}/60)}
\newlength{\col@width}
\setlength{\col@width}{1in*(\value{sch@col@width}/60)}
\newlength{\sch@depth}
\setlength{\sch@depth}{9in}
\newlength{\fill@length}
\newlength{\@temp@length}
\newlength{\@temp@length}
\newlength{\line@thickness} % The thickness of the lines in the drawing
\setlength{\line@thickness}{.4pt}
\newlength{\adjusted@cell@width}
\newlength{\adjusted@cell@height}
\newcounter{picture@units@wide}
\newcounter{xcoords}
\newcounter{ycoords}
\newcounter{timea}
\newcounter{timeb}
\newcounter{grid@width}
\newcounter{grid@height}
\newcounter{number@of@cells} % The number of VERTICAL cells
\newcounter{number@of@subcells}
\newcounter{number@of@days} % The number of days in the grid
\newcounter{dp@vlines} % The number of vertical lines actually needed is
% \value{number@of@days} + 1 ...
\newcounter{dp@hlines} % The number of horizontal lines actually needed is
% \value{number@of@cells} + 1 ...
\newcounter{dp@hcell@lines} % The number of horizontal lines that are
% either (1) associated with an hour, or
% (2) on the top or bottom of the grid.
\newcounter{pu@cell@width}
\newcounter{pu@cell@height}
\setcounter{pu@cell@height}{60}
\newcounter{pu@grid@top}
\newcounter{pu@grid@width}
\newcounter{pu@subticks}
\newcounter{start@time}
\newcounter{end@time}
\newcounter{x@coord} % Temporary x-coordinate
\newcounter{y@coord} % Temporary y-coordinate
\newcounter{@tempc}
\newcounter{@tempd}
\newcounter{label@sep} % distance from label to grid
\setcounter{label@sep}{5} %initialized to 5 picture units
\newcounter{x@Sunday}
\newcounter{x@Monday}
\newcounter{x@Tuesday}
\newcounter{x@Wednesday}
\newcounter{x@Thursday}
\newcounter{x@Friday}
\newcounter{x@Saturday}
\newsavebox{\temp@box}
\newif\ifweekends
\newcount\@i
\newcount\@j
\def\TimeRange#1{\compute@number@of@cells #1\end@compute}
\def\compute@number@of@cells#1:#2:#3:#4\end@compute{%
\setcounter{number@of@cells}{#3-%#1}%
\setcounter{start@time}{#1}%
\begin{verbatim}
148 \def\BeginOn#1{\def\StartDay{#1}}
149 \def\addlabels{%
150 \ifx\StartDay\@Sunday \expandafter\do\@Su\@week \relax
151 \else\ifx\StartDay\@Monday \expandafter\do\@M\@week \relax
152 \else\ifx\StartDay\@Tuesday \expandafter\do\@T\@week \relax
153 \else\ifx\StartDay\@Wednesday \expandafter\do\@W\@week \relax
154 \else\ifx\StartDay\@Thursday \expandafter\do\@Th\@week \relax
155 \else\ifx\StartDay\@Friday \expandafter\do\@F\@week \relax
156 \else\expandafter\do\@Sa\@week \relax
157 \fi\fi\fi\fi\fi\fi}
158 \fi
159 \fi
160
161 \def\@for #1:=#2 \upto #3 \step #4 \do #5{%
162 #1=#2\relax%
163 \@whilenum #1<#3 \do {#5 \advance#1 by #4}#5}
164
165 \def\addtimes{%
166 \setcounter{@tempc}{\value{StartTime}}%
167 \@for \@i :=0 \upto \value{NumberOfCells} \step 1 \do%
168 {\setcounter{x@coord}{0}% Set the x-coord right
169 \setcounter{y@coord}{\value{GridHeight}-60*\@i}% adjust for the right hour cell
170 \ifnum\value{@tempc}>12%
171 \setcounter{@tempd}{\value{@tempc}-12}%
172 \put(\value{x@coord},\value{y@coord})\makebox(0,0)[r]{\tiny\the@tempd:00 pm \ }}%
173 \else\put(\value{x@coord},\value{y@coord})\makebox(0,0)[r]{\tiny\the@tempc:00 am \ }}%
174 \fi\relax%
175 \@for \@j := \value{PuSubticks} \upto 59 \step \value{PuSubticks} \do%
176 {\ifnum\@i=\value{NumberOfCells}\relax%
177 \relax%
178 \else%
179 \ifnum\@j=60%
180 \relax%
181 \else%
182 \ifnum\@j<10%
183 \def\the@minutes{0\the\@j}%
184 \else\def\the@minutes{\the\@j}%
185 \fi%
186 \setcounter{y@coord}{\value{y@coord}-\@j}%
187 \ifnum\value{@tempc}>12%
188 \setcounter{@tempd}{\value{@tempc}-12}%
189 \put(\value{x@coord},\value{y@coord})\makebox(0,0)[r]{\tiny\the@tempd:00 pm \ }}%
190 \else\put(\value{x@coord},\value{y@coord})\makebox(0,0)[r]{\tiny\the@tempc:00 am \ }}%
191 \fi%
192 \fi%
193 \fi%
194 \setcounter{y@coord}{\value{y@coord}+\@j}%
195 \addtocounter{@tempc}{1}}%
196
197 \def\do\@days##1\#2\#3\#4\#5\#6\#7{
\end{verbatim}
\{\setcounter{x@}\@temp}{\@i*value\{pu@cell@width\}}\%
\advance\@i by 1\}
\def\skipday@i{T}
\def\skipday@ii{W}\fi
\ifx\start@day\@Friday
\@i=0\relax\%
\@tfor \@temp := {Friday} {Saturday} {Sunday} {Monday} {Tuesday} {Wednesday} {Thursday}
{\setcounter{x@}\@temp}{\@i*value\{pu@cell@width\}}\%
\advance\@i by 1\}
\def\skipday@i{W}
\def\skipday@ii{F}\fi
\ifx\start@day\@Saturday
\@i=0\relax\%
\@tfor \@temp := {Saturday} {Sunday} {Monday} {Tuesday} {Wednesday} {Thursday} {Friday}
{\setcounter{x@}\@temp}{\@i*value\{pu@cell@width\}}\%
\advance\@i by 1\}
\def\skipday@i{F}
\def\skipday@ii{Th}\fi
}

% Commands to insert info about an appointment
% ------------------------------------------------------------------------
\newif\ifset@start@time
\newif\ifset@end@time
\newif\ifsetboxdepth
\newif\ifinrange
\def\NewAppointment#1#2#3{% #1 = name, #2 = background color, #3 = textcolor
\expandafter\def\csname #1\endcsname##1##2##3##4{%
\setboxdepthtrue% assume we want to calculate the box depth
\inrangetrue% assume the appt is in range
\set@start@timetrue% assume we want to calculate the start time
\set@end@timetrue% assume we want to calculate the end time
\include@true% assume we will include it
\edef\appt@name{#1}% save the appt name
\edef\appt@color{#2}% save the background color
\edef\appt@textcolor{#3}% save the save color
\expandafter\def\csname #1@name\endcsname{##1}% save the name
\expandafter\def\csname #1@location\endcsname{##2}% save the loc.
\expandafter\def\csname #1@days\endcsname{##3}% save the days
\expandafter\def\csname #1@time\endcsname{##4}% save the time
\place@appt@box##3,\stop}}
\NewAppointment{class}{dark}{black}
\def\place@appt@box#1{%
\ifx#1\stop \let\@next=\@gobble\fi\@next#1}
\def\NewAppointment{name}{background color}{textcolor}
% ------------------------------------------------------------------------
\def\set@x@coords#1,{
  \ifx\the@day\@sunday\setcounter{xcoords}{\value{x@Sunday}}%
  \else\ifx\the@day\@monday\setcounter{xcoords}{\value{x@Monday}}%
    \else\ifx\the@day\@tuesday\setcounter{xcoords}{\value{x@Tuesday}}%
      \else\ifx\the@day\@wednesday\setcounter{xcoords}{\value{x@Wednesday}}%
        \else\ifx\the@day\@thursday\setcounter{xcoords}{\value{x@Thursday}}%
          \else\ifx\the@day\@friday\setcounter{xcoords}{\value{x@Friday}}%
            \else\setcounter{xcoords}{\value{x@Saturday}}%
              \fi\fi\fi\fi\fi\fi\fi\fi\fi\fi
  \edef\@@temp{\csname \appt@name @time\endcsname}%
  \expandafter\set@y@coords\@@temp\stop}
\def\set@y@coords#1:#2-#3:#4\stop{%
  \def\@starthour{#1}%
  \def\@startminutes{#2}
  \def\@endhour{#3}%
  \def\@endminutes{#4}%
  \ifnum#1<\value{start@time} \setcounter{ycoords}{\value{grid@height}}%
    \edef\@starthour{\value{start@time}}%  
    \def\@startminutes{0}%
    \set@start@timefalse%  
  \fi%
  \ifnum#3<\value{end@time} elax%
    \else \edef\@endhour{\value{end@time}}%
      \def\@endminutes{0}%
      \setcounter{ycoords@bot}{0}%
      \set@end@timefalse%  
    \fi%
  \ifset@start@time%
    \setcounter{ycoords}{\value{grid@height}-(60*(#1-\value{start@time})+#2)}%  
  \fi%
  \ifset@end@time%  
    \setcounter{ycoords@bot}{\value{grid@height}-(60*(#3-\value{start@time})+#4)}%  
  \fi%
  \setlength{\box@depth}{\@endhour\cell@height + (\cell@height*\ratio{\@endminutes pt}{60pt} - \@starthour\cell@height - (\cell@height*\ratio{\@startminutes pt}{60pt}))%  
  \ifnum#1<\value{end@time} elax%  
    \else \relax \inrangefalse \fi%  
  \fi%  
  \if@include%  
    \put(\value{xcoords},\value{ycoords}){\colorbox{\appt@color}{\parbox[t]{\cell@width}{\vspace{\box@depth}}}}%
    \thinlines%  
    \put(\value{xcoords},\value{ycoords}){\line(1,0)\value{pu@cell@width}}}%  
  \fi%  
\newif\if@include%  
\def\include\appt@box\place@appt@box%  
\ifweekends \relax % if we use 7-days, this won't change%  
\else \ifx \the@day\skipday@i \includefalse \fi \relax % first condition for change%  
  \ifx \the@day\skipday@ii \includefalse \fi \relax % second condition for change%  
  \ifinrange \relax \else \includefalse \fi %  
\fi%  
\put(\value{xcoords},\value{ycoords}){\colorbox{\appt@color}{\parbox[t]{\cell@width}{\vspace{\box@depth}}}}%  
\thinlines%  
\put(\value{xcoords},\value{ycoords}){\line(1,0)\value{pu@cell@width}}}%  
\put(\value{xcoords},\value{ycoords}){\line(1,0)\value{pu@cell@width}}}
Change History

v1.00
  General: Initial version. ........ 1

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