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Computational Methods for Statistics with Applications

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Writing reports in \mathbb{R} and Matlab



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Publishing in \mathbb{R}



Writing reports in \mathbb{R} - vignettes

Borrowed some stuff from Charlie Geyer, University of Minnesota, School of Statistics.

<http://www.stat.umn.edu/~charlie/Sweave/>



Writing reports in \mathbb{R} - vignettes

```
Install package 'xtable'
```

```
file Rreport.Rnw needed
```

```
rnwfil <- system.file("Sweave", "Rreport.Rnw", package = "utils")
```

```
Sweave(rnwfil)
```

```
Creates a Latex file named Rreport.tex
```

```
pdflatex Rreport.tex
```



Writing reports in \mathbb{R} - vignettes

```
R> ?system.file
```

Automatic generation of reports by mixing word processing markup (like latex) and S code. The S code gets replaced by its output (text or graphs) in the final markup file. This allows a report to be re-generated if the input data change and documents the code to reproduce the analysis in the same file that also produces the report.

'Sweave' combines the documentation and code chunks together (or their output) into a single document.

'Stangle' extracts only the code from the Sweave file creating a valid S source file (that can be run using 'source').

Code inside '`\Sexpr{}`' statements is ignored by 'Stangle'.



What is a .Rnw file?

```
\documentclass[12pt]{article}
...
\begin{document}
\centerline{My first attempt}

\bigskip
We can compute how much is  $\sin(\pi/2)$ :\\
<<label1>>=
var <- sin(pi/2)
@

Well, it is equal to:
<<label2>>=
var
@
\end{document}
```



.Rnw file, cont.

```
R> Stangle( 'Rreport.Rnw' ) #extract the R-code  
R> source( "Rreport.R" )   #execute the R-code
```




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Publishing in Matlab



Publishing in Matlab:

The MATLAB product allows you to quickly publish your M-file code to enable you to describe and share your code with others who may or may not have MATLAB software.

Acceptable formats for publishing are:

HTML

XML

LATEX

Microsoft Word R

Microsoft PowerPoint



Publishing in Matlab: prepare your .m file

```
%% With these few lines we test Matlab's publishing capacities
%% Step 1: Perform computations
% We perform the following operations:
% [x,y] = meshgrid(0:0.1:1,0:0.1:1);
% z = sin(2*pi*x).*cos(pi*y/4);

[x,y] = meshgrid(0:0.05:1,0:0.05:1);
z = sin(2*pi*x).*cos(pi*y/4);

%% Step 2: Produce some graphics
%
% figure(1),clf
% mesh(x,y,z)

figure(1),clf
mesh(x,y,z)

...
```



Publishing in Matlab: prepare your .m file

```
%% Step 3: More graphics
% figure(2),clf
% h=surf(x,y,z); colorbar
figure(2),clf
h=surf(x,y,z), colorbar

% a=ones(size(z)); a(1:5,1:5)=0.99; alpha(h,a)
a=ones(size(z));
a(1:5,1:5)=0.99;
alpha(h,a)
%%
% <latex>
% \begin{tabular}{|c|c|} \hline
% $n$ & $n!$ \\ \hline
% 1 & 1 \\
% 2 & 2 \\
% 3 & 6 \\ \hline
% \end{tabular}
% </latex>
```



Publishing in Matlab: choose your configuration setting

Edit Configurations

sine_wave_f.m x Publish configuration name: sine_wave_f

sine_wave_f.m

- sine_wave_f

MATLAB expression:

```
% Modify expression to add input arguments.  
% Example:  
% a = [1 2 3; 4 5 6];  
% foo(a);  
  
sine_wave_f
```

Publish settings: User Default Save As...

Output settings

| | |
|--------------------|-------------------------|
| Output file format | html |
| Output folder | I:\my_MATLAB_files\html |
| XSL file | |

Figure settings

| | |
|---------------------------|-----------------|
| Figure capture method | entireGUIWindow |
| Image Format | default (png) |
| Use new figure | true |
| Max image width (pixels) | Inf |
| Max image height (pixels) | Inf |
| Create thumbnail | true |

Code settings

Close Publish Help



Publishing in Matlab: the result

```
.../html> ls  
test_report_matlab_01.eps  
test_report_matlab_03.eps  
test_report_matlab.tex  
test_report_matlab_02.eps  
  
test_report_matlab.html
```

http://www.mathworks.se/help/techdoc/matlab_env/briymz8-1.html