More on Reporting with IRIS

The reader should be comfortable with the material through `basic_report.pdf`.

Contents

- Clear workspace
- More on figures in reports
- More on tables and matrices in reports

Clear workspace

```
clear all;
close all;
```

More on figures in reports

One can do many things with figures in IRIS reports: add subplots, legends, highlight certain periods (great for recession bars), add vertical lines, confidence bands, etc. The structure is hierarchical so any property set at the figure level will apply to all its children (graphs, series, etc.). The user can even pass a style structure at any of those levels which is an easy way to specify line thickness, color, whether the line is to be solid or dotted, etc.

Type

```
help report/object_name
```

to learn more about any of the objects shown belore (`figure`, `graph`, `series`, `highlight`, etc).

```
rng = mm(2000,1):mm(2010,11);
d = struct();
d.xx = tseries(rng,@rand);
d.zz = 100*diff(log(d.xx));
d.cc = cumsum(d.xx);
d.bb = 1/d.xx;

range = qq(2000,1):qq(2004,4);
d.x = cumsum(tseries(range,@randn)*0.03);

sty = struct(); a
sty.line.lineWidth = {2,1.5};
sty.line.lineStyle = {'-','-.'};
sty.axes.xgrid = 'off';
sty.axes.ygrid = 'off';
sty.legend.box = 'off'; b
sty.legend.location = 'NorthWest';
sty.patch.facecolor = [1 0.5 1]; c
sty.vline.color = {'red',[0,0.5,0]};
sty.vlineCaption.color = {'red',[0,0.5,0]};
```

```
sty.vlineCaption.fontWeight = {'normal','bold'};
sty.highlight.faceColor = {[1,0.8,0.8],[0.8,0.8,1]};
sty.highlightCaption.color = 'black';

sty2 = struct;
sty2.vline.color = 'magenta';
sty2.vlineCaption.color = [1,0.5,0];
sty2.highlight.faceColor = [0.7,0.7,0.7];
sty2.highlightCaption.color = 'blue';

recess = {mm(2001,3):mm(2001,11),mm(2007,12):mm(2009,6)}; d

x = report.new('More on figures');

x.figure('Here is how you do subplots',...
    'range',rng,...
    'subplot',[2 2]); e

    x.graph('Some series');
        x.series('',d.xx);
    x.graph('You can change the frequency','range',qq(2005,1):qq(2010,4));
        x.series('',convert(d.cc,'q'));
    x.graph('You can add two series in a graph','legend',true);
        x.series('One',d.zz);
        x.series('Two',d.bb);

x.figure('Lets apply a style to this figure',...
    'range',rng,...
    'subplot',[2 2],...
    'style',sty);

    x.graph('Some series','style',struct()); f
        x.series('',d.xx);
    x.graph('You can change the frequency','range',qq(2005,1):qq(2010,4));
        x.series('',convert(d.cc,'q'));
    x.graph('You can add two series in a graph','legend',true);
        x.series('One',d.zz);
        x.series('Two',d.bb);

x.figure('Confidence bands','range',rng,'style',sty);
    x.graph('A very important series');
        x.band('',d.cc,tseries(rng,-2),tseries(rng,+2));

x.figure(...
    {'Vertical lines and highlighting',...
    'probably more than you want to know...'},... gi
    'range',range,'style',sty); h

    x.graph('Graph 1');
```

```
        x.series('',d.x);
        x.vline('\leftarrow This is 2001:4',qq(2001,4),'hPosition','right');
        x.vline('This is 2004:2 \rightarrow',qq(2004,2), ...
            'vPosition','bottom','hPosition','left');
        x.highlight('',qq(2000,3):qq(2002,1));
        x.highlight('\leftarrow Highlight \rightarrow', ...
            qq(2002,3):qq(2003,4),'vPosition','middle','hPosition','centre');

    x.graph('Graph 2');
        x.series('',d.x);
        x.vline(' You may wonder what this is \cdot\cdot\cdot',qq(2001,2), ...
            'vPosition','middle','hPosition','right');

    x.graph('Graph 3','style',sty2,'hPosition','left');
        x.series('',d.x);
        x.vline('But you ',qq(2001,1),'vPosition',0.8);
        x.vline('certainly ',qq(2002,1),'vPosition',0.6);
        x.vline('guess ',qq(2003,1),'vPosition',0.4);
        x.vline('all these ',qq(2004,1),'vPosition',0.2);
        x.highlight(' From a date to a date',qq(2000,3):qq(2003,2), ...
            'vPosition',0.1,'hPosition','left');

    x.graph({'Graph 4','subtitle'},...  gi
        'style',sty2,'hPosition','left');
        x.series('',d.x);
        x.highlight('Recession',{qq(2000,3:4),qq(2001,4):qq(2002,3),qq(2004,1)}, ...
            'hPosition','center');

x.figure('Bar charts and contribution charts',...
    'range',range);

    x.graph('Graph 1');
        x.series('',d.x,'plotfunc',@bar);  j

thissty = struct();
thissty.line.lineWidth = {3,1.5};
thissty.line.color = {[1 1 1],[0 0 0]};
thissty.axes.xgrid = 'off';
thissty.axes.ygrid = 'off';

    x.graph('Graph 2','legend',true,'style',thissty);
        x.series('',[d.x convert(d.xx,'q')],...
            'plotfunc',@conbar,'legend',{'x','xx'});  k
        x.series('',d.x+convert(d.xx,'q'),'legend',NaN);  l
        x.series('Sum',d.x+convert(d.xx,'q'));

x.publish('more_figures.pdf',...
    'maketitle',true);
```

a The IRIS style structure is organized in close analogy with Matlab's own hiearchical graphical language, both in terms of structure and syntax. When multiple property values are specified, they are applied to the approriate objects in order of appearance - in this example, when plotting multiple lines the first one will be solid and 2-point wide, while the second will be 1.5-point wide and dashed.

e Notice that you do not have to populate all for slots of the 2x2 figure.

f You can "opt out" of the style on some children by passing an empty structure.

c You can control the color of the confidence band in this way. The 3x1 vector encodes standard RGB color scheme intensities.

h You can actually omit the subplot option – IRIS will automatically fit the number of graphs you declare in the smallest possible grid.

gi You can add subtitles in this fashion to any object in an IRIS report.

b This is how you can manipulate legend properties.

j As the name suggests, `plotfunc` allows the user to choose among several different plotting functions. Type

```
help report/series
```

to learn more.

k The `conbar` function plots a multivariate `tseries` object as a stacked bar chart. This is a very useful type of chart in practice, because it is a visually appealing way to present decompositions of, for example, GDP forecasts into national account components.

l A nice thing to do with a `conbar` is to overlay the headline number you are decomposing as a line chart on top of it. To increase visibility, you can, for example, plot the same line twice, once wider and in white and a second time thinner and in another color. Note that passing NaN to the `'legend'` option results in excluding the 'phantom' series from the list of legend entries.

More on tables and matrices in reports

One of the greatest strengths of the IRIS `table` objects is the ability to conditionally format values based on user-specified 'tests'. Apart from that, you can easily display 2 sets of numbers for one series – ideal for showing headline values and shock-minus-control values from some baseline. Finally, you can also display mixed frequencies in one and the same table.

To see the list of table or matrix attributes you can 'test' for purposes of conditional formating, type, respectively

```
help report/series
help report/matrix
```

```
d1.a = tseries(qq(2009,1):qq(2011,4),@rand); m
d1.x = tseries(qq(2009,1):qq(2011,4),@rand);
d1.y = tseries(qq(2009,1):qq(2011,4),@rand);
d1.ylow = d1.y - tseries(qq(2009,1):qq(2011,4),@rand);
d1.yhigh = d1.y + tseries(qq(2009,1):qq(2011,4),@rand);

```

```
d2.a = tseries(qq(2009,1):qq(2011,4),@rand); n
d2.x = tseries(qq(2009,1):qq(2011,4),@rand);
d2.y = tseries(qq(2009,1):qq(2011,4),@rand);
d2.ylow = d2.y - tseries(qq(2009,1):qq(2011,4),@rand);
d2.yhigh = d2.y + tseries(qq(2009,1):qq(2011,4),@rand);

d = dbfun(@(x,y) [y,y-x],d1,d2); o

c = struct();

c.test  = 'value < 0.5'; p
c.format = '\textcolor{red}{?}';

c(2).test  = 'strcmp(text,''XXX'')'; q
c(2).format = '\mathit ?';

c(3).test  =  '~isempty(strfind(mark,''Delta''))'; r
c(3).format = '[?]';

cfm.test  = 'col == row'; s
cfm.format = '\colorbox{yellow}{?}';

x = report.new();

x.text()
%{
Conditional formatting: \par
In the following tables, there are two
conditional formats used:
(i) All values smaller than 0.5 are displayed red;
(ii) All values in rows under the heading 'XXX' are in italics;
(iii) Table rows marked with a delta sign, $\Delta$ (difference against the
last period scenario) are enclosed in square brackets.
%}

x.table('Table with a classical date format', ...
   'range',qq(2009,1):qq(2011,4), ...
   'dateFormat','YYYY:P', ...
   'condFormat',c, ... t
   'marks',{'Baseline','{$\Delta$}'});

   x.series('AAA',d.a);
   x.series('XXX',d.x,'showMarks',false);
   %x.band('BBB',d.y,d.ylow,d.yhigh);

x.table('Table with a two-line date format', ...
   'range',qq(2009,1):qq(2011,4), ...
   'dateFormat',{'YYYY','FP'}, ...
   'condFormat',c, ...
```

```
   'marks',{'Baseline','{$\Delta$}'});

   x.series('AAA',d.a);
   x.series('XXX',d.x,'showMarks',false);
   %x.subheading('This is a subheading')
   %x.series('BBB',d.y,d.ylow,d.yhigh);

x.matrix('Some matrix',...
    rand(10),...
    'rowNames',{'aa','bb','xx','ee','ww','qq','rr','ss','pp','mm'},...
    'colNames',{'qq','zz','ff','hh','bb','nn','jj','kk','ll','oo'},...
    'condFormat',cfm);

x.publish('more_tables.pdf');
```

m Last period scenario.

n Baseline scenario.

o Database with two columns: Baseline and the difference between baseline and last period scenario.

t Specify conditional formatting. Passed to the `table` object using the `'condFormat'` option. Note that if a particular entry complies with two or more tests, the corresponding formats are all applied (cumulated).

p Test 1 – values smaller than 0.5.

q Test 2 – table rows under the heading 'XXX'.

r Test 3 – table rows whose marks contain 'Delta'.

s Matrix Test 1 – row number equal to column number.