QFC Reproducible Research Workshop - Software Setup

December 11-12, 2013.

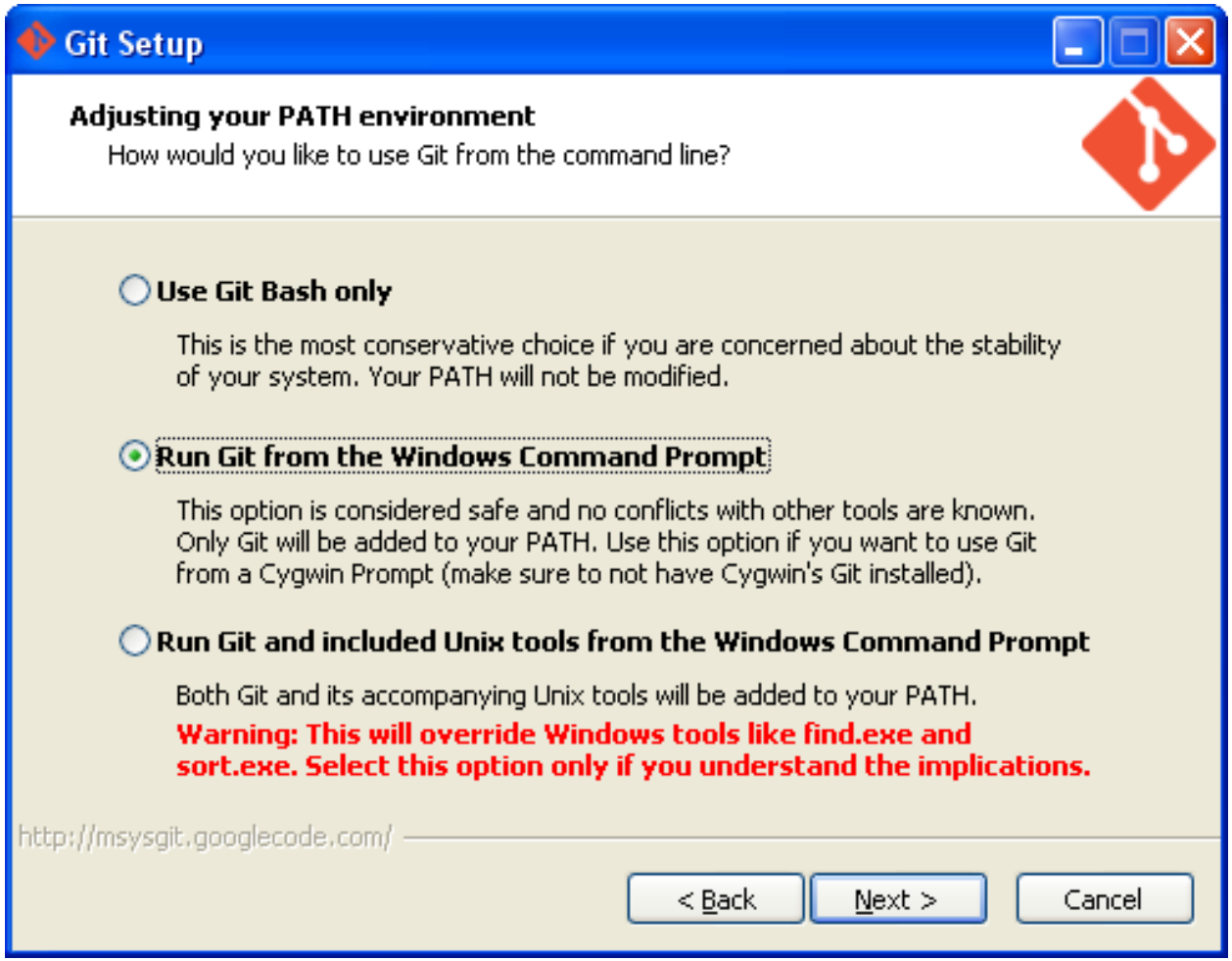
Installed Software

These set up instructions will:

1. verify that you have working installations of the following software packages:
   - R (http://www.r-project.org)
   - ADMB (http://admb-project.org/)
   - LaTeX
     - proTeXt (http://www.tug.org/protext/) or MiKTex (http://www.miktex.org/) on widows
     - MacTex (http://www.tug.org/mactex/) on a mac
     - Tex Live (http://www.tug.org/texlive/) on linux
   - git (http://git-scm.com/)
2. Configure emacs and verify functionality

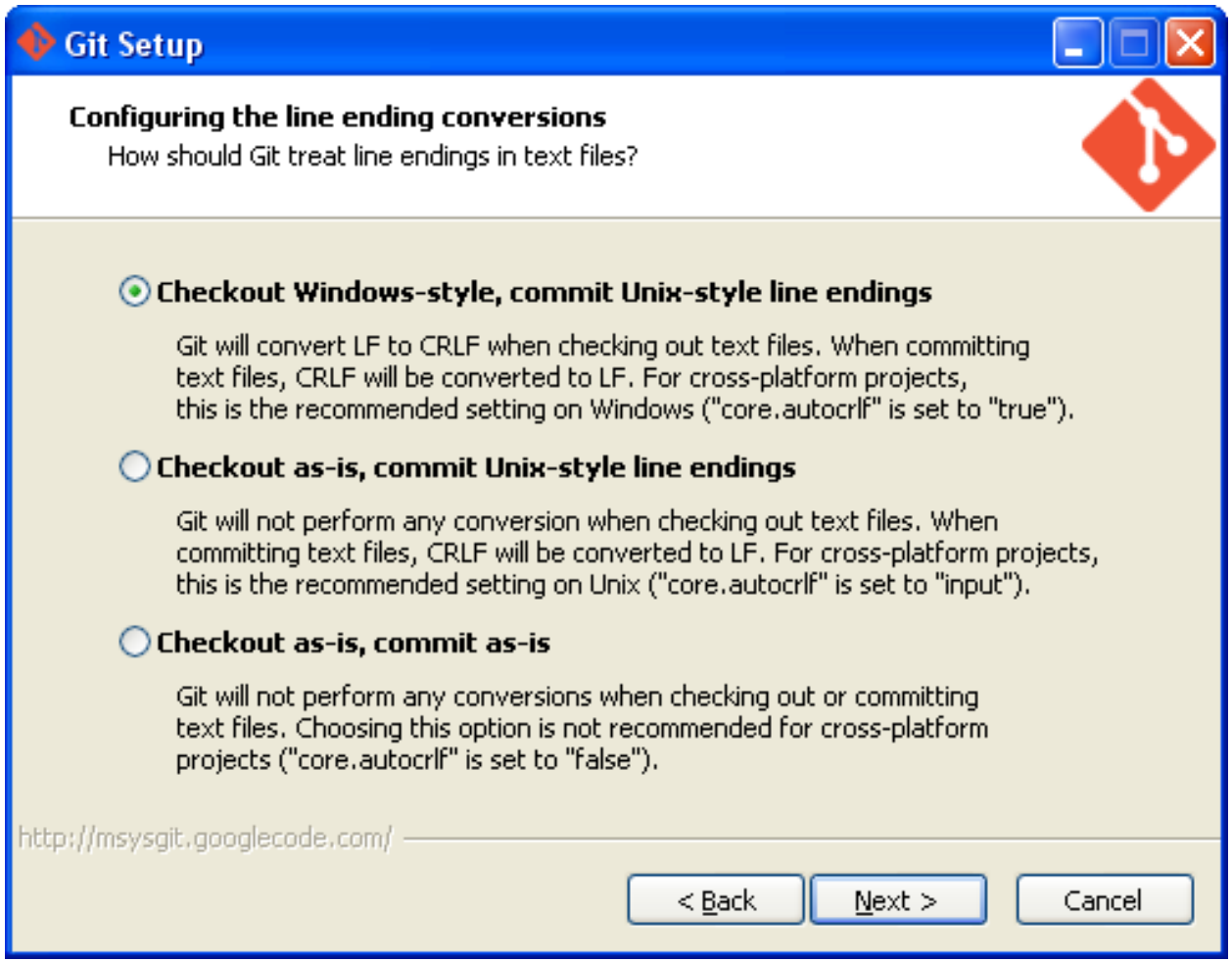
when installing git

- select ‘Run Git from the Windows Command Prompt’



When installing git

- select 'Checkout Windows-style, commit Unix-style...'



- select defaults for all remaining options

Set up

- a zip file has been provided that contains all of the configurations files and additional packages needed for the workshop
- unzip the contents of the archive to a convenient location and note the path
- in the remaining slides, substitute '~' with the path to the workshop folder on your computer

What's in the zip?

- emacs executable
- aspell executable - a spell checker for e-macs
- emacs plugins:
  - autocomplete
  - admb-ide
  - ESS - emacs speaks statistics
  - magit
  - yasnippet
- associated utility files

Set up - emacs

- navigate to `~/workshop`
- double click 'emacs.bat' to start emacs (ignore warnings for now)
- from within emacs open the `.emacs` file located in the `~/workshop` directory
- edit line 5 of `.emacs` to reflect location of the `~/workshop/emacs` directory on your computer
- save the `.emacs` file and close emacs
- re-open emacs by double clicking on emacs.bat
  - the warnings should be gone

.emacs workshop-root

- pay particular attention to line 5 of ~/workshop/.emacs
- it must be absolutely correct
  - all of slashes must lean to the right ("/")
  - there must be a trailing slash
- this will work:

```
(defvar workshop-root "C:/<YOUR PATH>/workshop/")
```

- these will **NOT**:

```
(defvar workshop-root "C:/<YOUR PATH>/workshop")
(defvar workshop-root "C:\<YOUR PATH>\workshop\")
(defvar workshop-root "C:\<YOUR PATH>\workshop")
```

Starting Emacs

~/workshop/emacs.bat

- for the remainder of this document and throughout the workshop always start emacs using `~/workshop/emacs.bat`
  - the batch file starts emacs with the workshop configuration file
  - if you start emacs from somewhere else (desktop-icon), the functionality needed for the workshop will not be available.

Tests

- each of following slides assume that you have a command prompt open and will look like:

> <command to type>

- The top line of the panel indicates what you need to type at the prompt,
- the body of the panel indicates what you should see if you were successful
  - a ... indicates that the output presented here has been trimmed
- if there are lines below the ... (eg. `q()`), they indicate the command(s) needed to return to the prompt

Tests (cont'd)

- if the command prompt returns "not recognized as an internal or external command" the software may not be installed or configured properly - please consult the documentation for that software
- open a command prompt or open emacs and type `Alt-x shell <return>`
  - (`Alt + x` key, followed by `s-h-e-l-l <RETURN>`)
- a new buffer named `**shell**` should open
- at the command prompt (>) type:

Tests - Git

> git

```
git
usage: git [--version] [--exec-path[=<path>]] [--html-p
           [-p|--paginate|--no-pager] [--no-replace-obj
           [--git-dir=<path>] [--work-tree=<path>] [--n
           [-c name=value] [--help]
           <command> [<args>]
...
>
```

Tests - ADMB

> admb

```
Usage: admb [-d] [-g] [-r] [-s] model

Build AD Model Builder executable from TPL.

  -d      Create DLL
  -g      Insert debugging symbols
  -r      Create ADMB-RE
  -s      Enforce safe bounds
  model   Filename prefix, e.g. simple
>
```

Tests - R

> R --vanilla

```
R version 3.0.1 (2013-05-16) -- "Good Sport"
Copyright (C) 2013 The R Foundation for Statistical Co
Platform: i386-w64-mingw32/i386 (32-bit)

R is free software and comes with ABSOLUTELY NO WARRAN
You are welcome to redistribute it under certain condi
Type 'license()' or 'licence()' for distribution detai

...

q()
>
```

Tests - LaTeX

```
> latex


latex
This is pdfTeX, Version 3.1415926-2.3-1.40.12 (MiKTeX 2
**
...

\end
\end
>
```

R-Packages

- the following R-packages will be used in the workshop
  - knitr (and/or sweave)
  - reshape2
  - xtable
  - Hmisc
  - ADMButils (not available on CRAN, but see `~/utils/Rpackages`)

In R type:

```
> install.packages(c('knitr', 'reshape2', 'xtable',
                     'Hmisc'))
```

ADMB - Compile, Link and Run

- verify that admb actually works from the command line
- open command prompt
- navigate to the 'simple' example that comes with most admb installations
- type the following commands into the prompt

admb simple

```
> cd C:/<YOUR PATH TO AMDB>/admb/examples/admb/simple
> admb simple
> simple
```

- the simple model should compile, link and run

Setting up the ADMB-ide

- copy `~/workshop/utils/admb2r.cpp` to `ADMB_HOME/include/admb2r.cpp`
- edit paths in `~/workshop/emacs/SetADMBpaths.bat`
  - `ADMB_HOME` is the directory that contains `bin`, `examples`, `include`, and `lib` subdirectories associated with your ADMB installation
  - `CPP_COMPILER` is the path to the `/bin` directory of your C++ compiler

Visual Studio C++

- If you use Visual Studio as your C++ compiler edits to `~/workshop/emacs/SetADMBpaths.bat` won't work. I'll try and have a solution in time for the workshop.

Test emacs configuration

- R
  - in emacs type `Alt-x R <RETURN>`
  - accept the default working directory
    - ★ An active R-prompt should appear in a new buffer named `*R*`
  - open file `~/tests/test.r`
  - in the test file, place your cursor immediately after `rtemp1` and press `<TAB>`
    - ★ a blank R-template should appear in the buffer

Test emacs configuration (cont'd)

- R
  - highlight the line in `test.r` that contains `print(1:9)` and type `Ctrl-<enter>`
  - the numbers 1 to 9 should appear in the **R** buffer
  - type `Ctrl-x k` to close (kill) `test.r`
  - type `y` when emacs asks you if you are sure
  - type `q()` at the R-prompt to quit R

Test emacs configuration (cont'd)

- ADMB-ide
  - open the file `~/tests/simple/simple.tpl`
  - press <F8> to link and compile the simple model
  - once the model is compiled, press <F9> to run the model
  - standard ADMB output should appear in a buffer

Visual Studio C++

- These probably won't work is you are using Visual C++ as your compiler. Stay tuned.

Test emacs configuration (cont'd)

- git
  - type `Ctrl-c Ctrl-g`
  - emacs should prompt you for a Git repository
  - type `Ctrl-g` to quit
- ispell
  - open a new buffer and cut and paste some text (preferably with at least one spelling mistake)
  - type `Alt-x ispell <RETURN>`
  - suggestions for mis-spelled words should be provided
  - type `Ctrl-g` to quit