Today’s Topics

• Did you read Chapter 1 of JM?
  – Short Homework 2 (submit by midnight Friday)

• Today is Perl Day!
  – Did you install Perl on your own computer?
Application of the Day

• Text summarization service
  – available on Macs (turned off by default?)
  – available on Microsoft Word for Mac 2008 **but not** 2011
  – Open Text Summarizer (ots) (on Linux)
Application of the Day

- System Preferences (10.9-10.10)
Application of the Day

• Let’s try it on [www.arizona.edu](http://www.arizona.edu)

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Application of the Day

“It frees us from making various assumptions about individual sectors of the economy for each country,” she said. “This new methodology can be applied to any climate model output. It allows for an independent assessment of economic impacts of climate change from current methods (and) provides another tool in our toolbox for estimating climate change impacts.”

Lemoine explained that while the framework uses historical temperature and precipitation data, it does not account for factors such as economic and social systems, which could end up being more important than climate alone. That’s why, he envisions that their framework could be used when additional assumptions can be added to influence climate change policies.

“The major benefit is that we are not introducing another variable,” he said. “With that baseline, anybody else can lay on top of that in a more comprehensive or long-term.”

Uncovering the true costs of climate change and its potential for future changes to historical data to predict future impacts offers an empirically grounded method for approaching the task, Lemoine said.

“It’s a really hard question because there are a lot of links in the system,” he said. “You’re really just letting the data speak and projecting that forward to predict near-term climate change impacts.”

A new methodology co-developed by a UA economist uses historical data to predict how climate change could impact markets across the globe.

...Now a new statistical framework makes it possible to understand just how much climate change could impact markets across the globe.

A newly released paper, published in the journal Nature Climate Change, outlines methodology for using historical climate and economic data to predict how climate change could affect gross domestic product, a common economic performance measure, of countries around the world.

“A Top-Down Approach to Projecting Market Impacts of Climate Change,” is co-authored by Derek Lemoine, assistant professor of economics in the UA Eller College of Management, and Sarah Kapnick, physical research scientist for the National Oceanic and Atmospheric Administration at the Geophysical Fluid Dynamics Laboratory.

First data shows that near-term climate change could raise the average rate of

- Highlight text and control click to bring up contextual menu...
Application of the Day

Lemoine explained that while the framework uses historical temperature and rainfall data, it does not account for factors such as ecological disruptions or rising sea levels, which could end up being more important than the types of GDP impacts they focus on.

A new methodology co-developed by a UA economist uses historical data to predict how climate change could impact markets across the globe.
Application of the Day

• Extra Credit for the Curious
  – (submit with your homework 2)
  – Select an article from the UA website
  – Discuss whether you think the summarizer did a good job.
  – How do you think it works?
  – Do you think it should work on foreign language text?
    • If you have a Mac or OTS on Linux, try it...
Open Text Summarizer

- Web interface
  - [http://www.splitbrain.org/services/ots](http://www.splitbrain.org/services/ots)
Short Homework 2

• Submit your answers by **Friday midnight**
• Email submission (one file) to sandiway@email.arizona.edu
• Subject of email: 538/438 Homework 2 Your NAME
• Your name at the top of the file (I can’t always tell by the email id.) Also whether 538 or 438.
• Your answers to:
  1. *Is tough sledding* an **idiom** or **compositional in meaning**? Explain your answer in terms of your understanding of these two terms.
  2. *The chickens are ready to eat*
     In what way(s) is this sentence structurally **ambiguous**? Explain.
  3. *John said he dislikes nearly everyone he meets*
     In what way(s) is this sentence referentially **ambiguous**? Explain.
Perl Day

• Learn Perl
  – Books...
  – Online resources
    • http://learn.perl.org/
    • we begin with ...
    • http://perldoc.perl.org/perlintro.html
Perl History

• invented by Larry Wall in the mid-1980s
• Perl stands for “Practical Extraction and Reporting Language”

• It pulls together features from many pre-existing Unix-based tools:
  – efficient text processing: awk, sed
  – search: grep (regular expression search)
  – shell scripting: c-shell and others
Perl Factoid

• Larry Wall was a linguist (UC Berkeley)

Wall's training as a linguist is apparent in his books, interviews, and lectures. He often compares Perl to a natural language and explains his decisions in Perl's design with linguistic rationale. He also often uses linguistic terms for Perl language constructs, so instead of traditional terms such as "variable", "function", and "accessor" he sometimes says "noun", "verb", and "topicalizer".

from his wikipedia entry
Perl

• Interpreted language

*no compilation phase down to machine code* (cf. C)
  – lends itself to rapid prototyping and the writing of small programs.
  – *(Disadvantage*: slower than C.)*

• Huge collection of Perl modules (.pm) already written and freely available on CPAN *(Comprehensive Perl Archive Network)*
Perl Day

• Let’s go through
  – http://perldoc.perl.org/perlintro.html

For those who are curious, I use **aquamacs** as the text editor

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**Basic syntax overview**

A Perl script or program consists of one or more statements. These statements are simply written in the script in a straightforward fashion. There is no need to have a `main()` function or anything of that kind.

Perl statements end in a semi-colon:

```perl
1. print "Hello, world";
```
Perl Day

• Notes from the tutorial:
  – whitespace not always necessary, e.g.
    • print"Hello class!\n";
  – is fine, but good idea to consistently use spacing (not just for readability)
  – variable names must not begin with a number (use a letter), so
    • $538students is out
    • $students538 is ok
  – error messages are frequently completely uninformative (and sometimes misleading), e.g.
    Bareword found where operator expected at example.prl line 3, near "$538students"
    (Missing operator before students?)
    • Is the error associated with the variable starting with a number?
Perl Day

• **Reading Perl code (perldata) aloud:**
  – The '$' symbol works semantically like the English word "the" in that it indicates a single value is expected.

  – Entire arrays (and slices of arrays and hashes) are denoted by '@', which works much like the word "these" or "those" does in English, in that it indicates multiple values are expected.

  – Entire hashes are denoted by '%'... (no translation)

  – In addition, subroutines are named with an initial '&', though this is optional when unambiguous, just as the word "do" is often redundant in English.
Perl Day

• **Notes from the tutorial:**
  – semicolon (;) is not always necessary
    • Command separator token semantics vs. end of command (termination) token
    • Best practice is to terminate every command with a semicolon
  – Variable types:
    • Every variable type has its own namespace.
    • This means that $foo and @foo are two different variables.
    • It also means that $foo[1] is a part of @foo, not a part of $foo. *This may seem a bit weird, but that's okay, because it is weird.*
Exercises

• Practice using Perl
  – read the documentation and run the examples!

• Preparatory reading:
  – Chapter 2 of the textbook
  – we’ll be using Perl’s regular expression engine for this