Scripting for EDA tools

• Building chips is very expensive
  – Remember, this is about making money
  – Incredible complexity (don’t mess up!)
  – Many, many steps (don’t forget anything)
  – Need one recipe that everybody can use (many cooks)
  – Need to document the process (who did what, how?)
  – Can we do it over….. exactly the same way?

• Scripting allows us to take care of all these issues.

• Real world ASICs are built this way.
Scripting for EDA tools

- What is a script?
  - A series of statements in a text file that tell the computer what to do.
  - The statements are interpreted by a command interpreter also called a “shell”.
  - Statements can be normal control flow or calls to other programs or scripts. (scripts can call scripts)
  - They use some language
  - You have used them but may not know it. (makefiles)
Scripting for EDA tools

• Scripting environments
  – C shell (csh), TC shell (tcsh), Bourne shell (sh), Bash shell (bash), are very general purpose *nix shells.
  – PERL, Python, TCL are very general purpose scripting languages.
  – TCL drives most CAD tools (Synopsys, MGC)
  – Some tools have proprietary scripting language, e.g. Cadence Skill

• Most *nix CAD tools usually driven by a command interpreter (shell). Hence, “dc_shell-xg-t”
Scripting for EDA tools

• General purpose scripting language differences
  – TCL
    • Very simple
    • Easy to learn
    • Fairly powerful
    • Usually embedded in CAD tools
    • Often augmented with specialized commands for the tool
Scripting for EDA tools

• General purpose scripting language differences
  – PERL (Practical Extraction and Reporting Language)
    • Extremely powerful
    • Very popular, flexible
    • Swiss army chainsaw of scripting languages
    • Easy manipulation of files, processing textual information
    • PERL gives you 5 ways to do anything
    • Can be very cryptic, and hard to learn
    • Strong “cult” following
    • Learn it from the web
Scripting for EDA tools

• General purpose scripting language differences
  – BASH Shell (Bourne Again SH)
    • Linux command interpreter
    • Flexible, powerful
    • Good manipulation of files, controlling programs
    • Not too hard to learn
    • Learn it from the web
Scripting for EDA tools

- What scripting gives us
  - Automated chip build process
    - Repeatability
    - Documentation of the build process
    - No GUI’s to learn
    - Fast built times
    - Management of directories and files produced
    - Freedom to go for coffee while build is running
- “One day I realized that sadness is just another word for not enough coffee.” – Wally (Dilbert)
Scripting for EDA tools

• When to use the GUI…
  – First time through the tool
  – With whatever you do, capture the transcript file
  – The transcript file once renamed and edited is the beginning of your tool script