Lecture 9 - Debugging

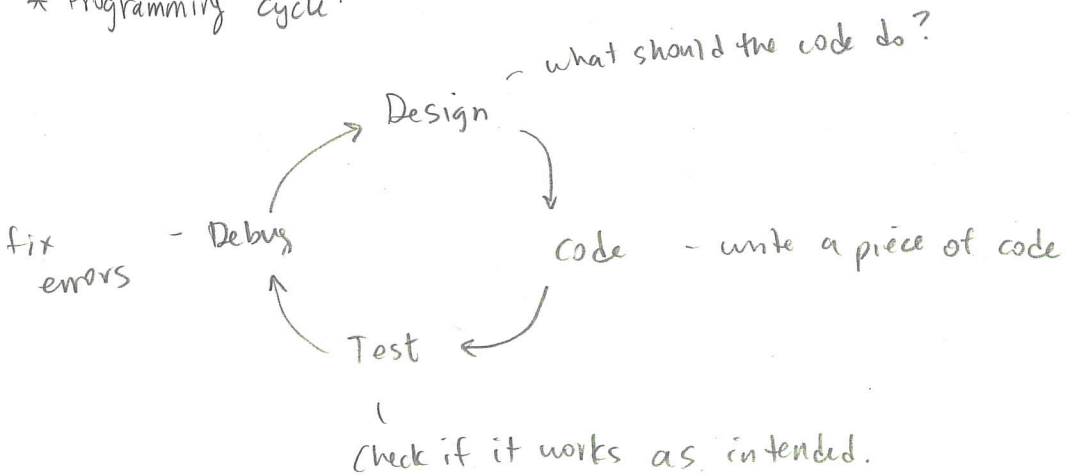
* Quiz / Prayer / AMA

I. How's it going?

* Exam review next time.
* what questions do you have?
* start looking at review sheet.
* HW hours histogram.

II. Debugging Tips

* Programming cycle.



* The programming cycle is easiest when you do it often. write and test small pieces of code at a time. If you haven't tested it there is probably a bug.

* [Q] who has experienced this?

* Types of Errors / Bugs

  - Syntax errors – "Spelling" / formatting
    – easiest, the interpreter finds
    (read the interpreter?)
    [Q] who can give me an example?

  - execution errors – Something bad happens
    Code won't run
    e.g. divide by 0, call array[6], but array only has len 5, bad variable assignment
    – medium hard → easy to locate, harder to fix
    [Q] who can give me an example?

  - logical errors – code runs, but gives the wrong answer.
    e.g. you wanted it to plot x vs. y but it isn't.
    – hardest to find and fix
    – computer is stupid; it does exactly what you told it, not what you want.
    [Q] who can give me an example?

* How Find & fix Bugs?

the scientific method!

loop:

(1) Observation - Is there a problem? No - wahoo! All done
yes - keep going

(2) Hypothesis - What do you think is wrong?
what clues are there?

(3) Experiment - How can you isolate & test the hypothesis?

Good Experiments

* Go to the last line of code that works
* Check your assumptions
* look at the contents of your variables → variable explorer
* "Comment-out" lines of code
* Go through code line by line (debugger)
* write down on paper what you think the code is doing.

Activity Debug code together.

- Write: Observation → Hypothesis → Experiment
- Be explicit