User Interface Design

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CMPT140
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Quiz 6: 10min, 20pts

- Compare and contrast: stacks and queues. [5]
  - Describe the operations on each.
- Convert the following into Reverse Polish Notation and show all steps to evaluate: [4]
  - 10 – 7 * 2 > - 5 and 9 == 2 ** 3
- What is a widget? [2]
- Define and contrast: [4]
  - Unit testing vs. integration testing
- What are the principles of the spiral model of development? Contrast with waterfall/WADES [5]

Quiz 6 answers: #1-2

- Compare and contrast: stacks and queues. [5]
  - Describe the operations on each.
  - Stacks: LIFO, push(), pop()
  - Queues: FIFO, enqueue(), dequeue()
- Convert the following into Reverse Polish Notation and show all steps to evaluate: [4]
  - 10 – 7 * 2 > - 5 and 9 == 2 ** 3
  - 10 7 2 * - 5 - > 9 2 3 ** == and
  - 10 → 10 7 → 10 7 2 → 10 14 → -4 → -4 5 → -4 -5 → True → T 9 → T 9 2 → T 9 2 3 → T 9 8 → T F → False

Quiz 6 answers: #3-5

- What is a widget? [2]
  - Interactive graphical component of UI
  - Responds to user input
- Unit testing vs. integration testing: [4]
  - Unit: test individual component in isolation
  - Integration: how components work together
- What are the principles of the spiral model of development? Contrast with waterfall/WADES [5]
  - Spiral is multiple iterations of waterfall: requirements may change, need to adapt

Human-computer interface

- WIMP/GUIs are just one kind of an interface between humans and computers
  - Input and Output
- Automated bank machine touch-screen
- Touch-tone keypad
- Voice recognition, speech synthesis
- Car steering wheel and pedals
- Head tracking / eye tracking
- EEG
- Other possibilities?

Some UI design principles

- Know your users: programmers? Man-on-the-street? Grandma

- Be consistent: names, colours, layout, parts of speech
- Use metaphors carefully: desktop, canvas
- Use multiple levels of complexity
  - Let the user tradeoff safety for control
- Always show the current state of the program:
  - Waiting for password? Processing?
  - Progress bars (that don't lie!)

More UI design principles

- From Constantine+Lockwood

- Structure: hierarchy, layout: windows, tabs, etc.
- Simplicity: make common tasks easy
  - Epicentre: design around primary purpose
- Visibility: need-to-know basis
- Feedback: current state, errors, etc.
- Tolerance: be flexible to user mistakes, save user data / user's hard work
- Reuse: consistent naming, behaviour

A few UI case studies

- BBC website
- Vincent Laforet website
- Blender3D application
- Google Calendar