Review and Practice, Pair Programming

Rose-Hulman Institute of Technology

Computer Science and Software Engineering

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Outline

- Review of week 1:
  - Defining and invoking functions
  - Definite loops, using a range statement
  - The Accumulator Loop pattern
- Pair Programming
- Practice, Man. Practice.

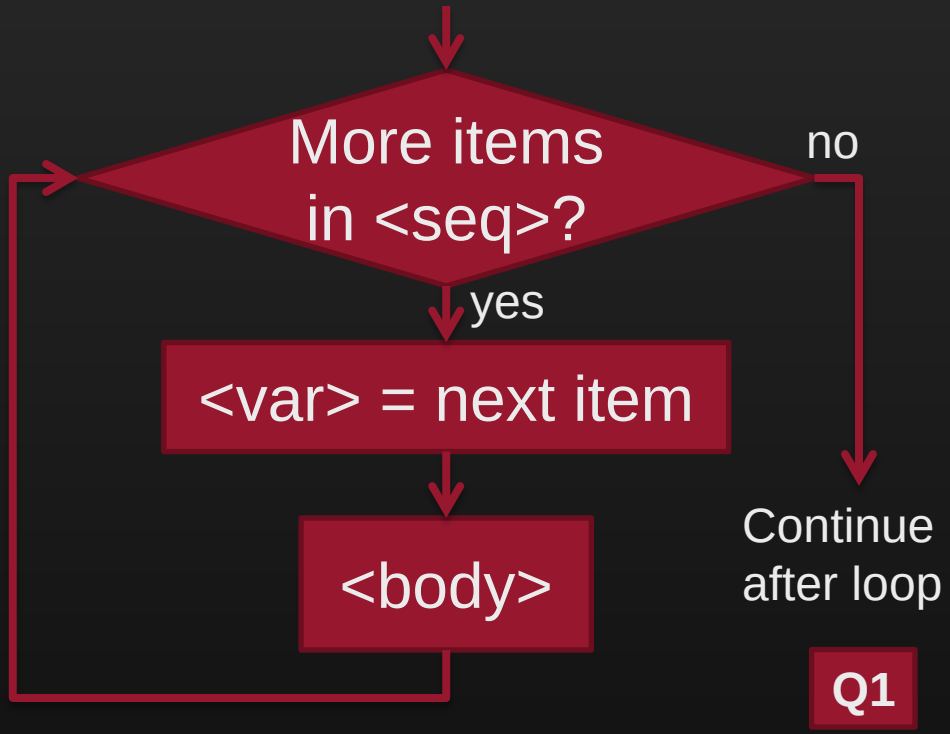
Check out project for today

- Go to SVN menu, “Checkout Project from SVN”, use existing repository, then…
- Browse for **04-ReviewAndPractice** project
- Accept options as presented
- Expand the **04-ReviewAndPractice** project that appears in Package Explorer (on the left-hand-side)

Accumulator Loop

- Accumulator combines processing parts of a list
- Common technique!
- Consider:

```
a = 0
for j in [1, 2, 3, 4]:
    a = a + j
    print(a)
```



Q1

Another loop with an accumulator

- Find the sum of all of the positive odd numbers that are ≤ 13
- Do it together as a class, in function **sumOddPositiveLessThan()**

More math library components

Python	Mathematics	English
pi	π	Approximation of pi
e	*e*	Approximation of *e*
sin(x)	sin x	The sine of x
cos(x)	cos x	The cosine of x
tan(x)	tan x	The tangent of x
atan2(y, x)	$\tan^{-1} y/x$	Arc tangent of angle of line from (0,0) to (x, y)
log(x)	ln x	The natural (base e) log of x
log10(x)	$\log_{10} x$	The base 10 log of x
exp(x)	e^x	The exponential of x

Math library functions

- Quadratic formula to find real roots for quadratic equations of the form $ax^2 + bx + c = 0$
- Solution:

$$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

- Write out the Python expression for the first formula.
- If time permits, test it in Eclipse

Q2

Review in Eclipse

- **exampleInputComputeOutput**: How to:
  - Organize a program into functions.
  - Input and convert the input to a float/int
  - Print (i.e., produce output).
  - Use a for loop.
    - A definite loop (using range).
    - An example of the Accumulator Loop Pattern.
  - How to use local variables
    - for the constant (3.9) and howManyToPrint (10), along with the input variable (x), etc

Pair Programming

Becoming a common interview technique!

- Working in pairs on a single computer
  - One person, the *driver*, uses the keyboard
  - The other person, the *navigator*, watches, thinks, and takes notes
- For hard (or new) problems, this technique
  - Reduces number of errors
  - Saves time in the long run
- Works best when partners have similar skill level
- If not, then student with most experience should navigate, while the other student drives.

Photo by Funchye - http://flic.kr/p/58xk28

Find a pair programming partner for HW4

Move to sit next to them for the rest of the period.

Decide who will drive first.

Mmm, food.

Accumulator Problem: Food Tasting

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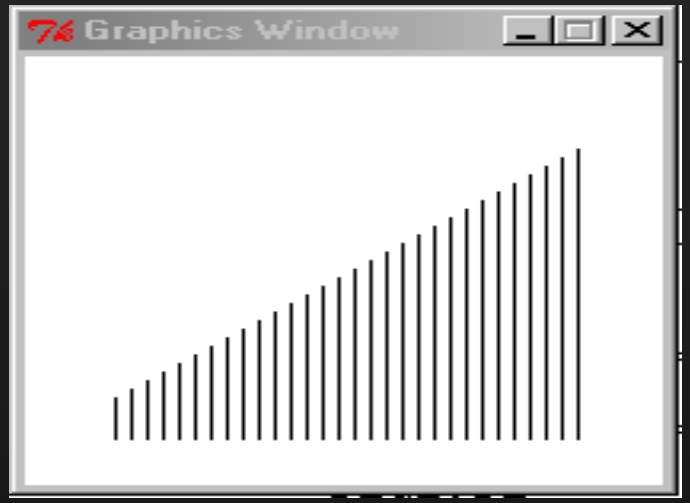
Accumulating Results: Factorial

- Work with your partner
- Follow the pair programming advice linked from HW4
- Do the TODOs in **factorial.py**

Graphics Exercise with Loops

- Trade pairing roles!
- Do the TODOs in **barChart.py**
- See provided **graphicsExample** module for sample code
  - Consider using variables to hold current x-coordinate and current line length
  - Change the values of those variables each time through the loop



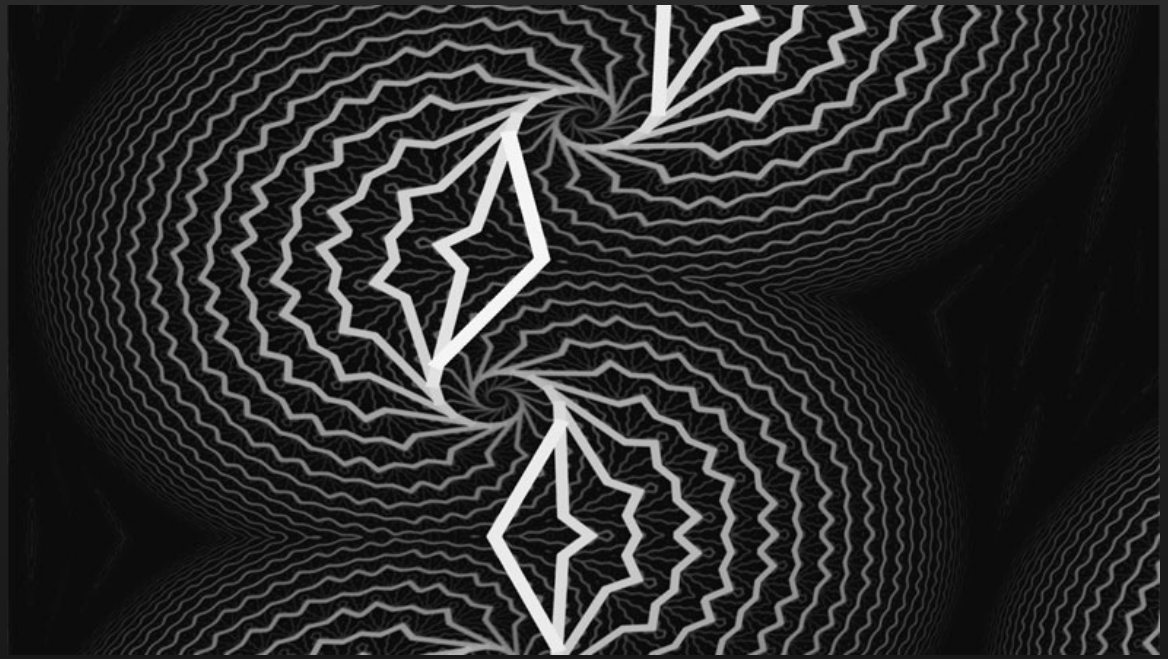


Photo by Sune P - http://flic.kr/p/5cYBHS

Feedback, Please

Help me, help you

Q4-6

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Rest of Today: HW4 work

- Pair programming:
  - **factorial**
  - **barChart**
- If you finish that, then individual work:
  - **bullsEye**
  - **sumAndCount**