ICS Fall 2017

Lab Exercises Week 6

Exercise 1 – Factorial(Recursion)

Write a program with recursion to find the factorial of provided non-negative integer n.

Example:

Given `n = 5`

Return `120`

Exercise 2 – Student Information(OOP)

Design a class `Student` that holds the following student data: `name`, `class_of`, and `major`. Write appropriate accessor and mutator methods. When we ask for desired information, the program should deliver.

Example: we want to have the following information displayed:

James , class of 2016 , who majors in Computer Science , will graduate in 2020.

Exercise 3 – Number Placement in OOP Style

- *n* numbers; *n* - 1 preset inequality sign
- **Goal**: insert the numbers so that the inequality hold

Example:

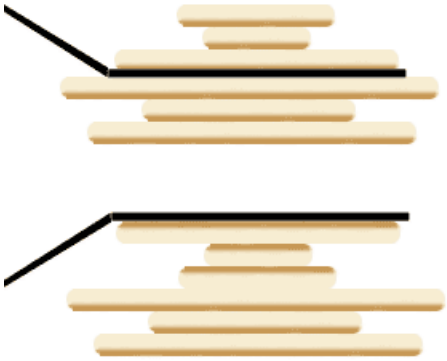
Numbers: [2, 3, 0, 1, 5]; Signs: [‘<’, ‘>’, ‘<’, ‘<’]

Solution: 0 < 5 > 1 < 2 < 3.

```
In [35]: run sign_ins.py
[1, '<', 20, '>', 9, '<', 19, '>', 16, '>', 10, '<', 13, '>', 12]
```

Exercise 4 – Pancake Sorting in OOP Style

- *n* pancakes of different sizes, randomly stacked
- Allowed action: slip a spatula under one pancake, and flip
- **Goal**: sort the pancakes (smallest at the top)



```
Unsorted pancakes: [13, 14, 2, 9, 16, 8, 7, 5, 18, 6]
Insert the pan at index 8 with the largest in flip as 18
Flip Up [18, 5, 7, 8, 16, 9, 2, 14, 13, 6]
Flip Down [6, 13, 14, 2, 9, 16, 8, 7, 5, 18]
```

Eventually…

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Insert the pan at index 0 with the largest in flip as 2
Flip Up [2, 5, 6, 7, 8, 9, 13, 14, 16, 18]
Flip Down [2, 5, 6, 7, 8, 9, 13, 14, 16, 18]
Final order of pancakes:  [2, 5, 6, 7, 8, 9, 13, 14, 16, 18]
```