Transition to Code

Upsorn Praphammontripong

CS 1111

Introduction to Programming

Spring 2018
Pseudocode

• Pseudocode is one of the methods that can be used to represent / describe an algorithm (usually in English)

• Not use specific programming language syntax

• Can be easily translated into a high-level programming language

• Usually include terms specifying a sequence of actions the a program will take
Control Structures

**Sequence**
- A series of statements that execute one after another

**Condition (if)**
- To decide which of the two or more different statements to execute depending on a certain condition

**Repetition (loop)**
- To repeat statements while certain conditions are true

**Subprogram**
- A small part of another program solving a certain problem
Control Structures

Sequence

- A series of statements that execute one after another

walk, walk, walk, walk, walk, walk, walk, right-turn-180-degree, sit
Control Structures

Condition (if)

- To decide which of the two or more different statements to execute depending on a certain condition

If (condition):
  statement1
else:
  statement2

true
  statement 1

false
  statement 2

condition

…..
Control Structures

Repetition (loop)

- To repeat statements while certain conditions are true

Repeat until you are in front of the chair, turn, sit

while (condition):
    statement1
    statement2
    statement3
    ...

true

condition

false

? steps
Control Structures

Subprogram
- A small part of another program **solving a certain problem**
- A collection of subprograms solves the original problem

A meaningful collection of sequence, conditions, repetitions, and subprograms
Imagine you are writing a program that accepts six project scores from the user. All scores are out of 100 points, except the first (which is out of 30) and the fifth (which is out of 50). The program allows a user to specify whether the lowest project score will be dropped. The program then computes and displays the highest average score for the projects.

For example, if a user enters
- Score for project 1 = 15
- Score for project 2 = 55
- Score for project 3 = 55
- Score for project 4 = 55
- Score for project 5 = 25
- Score for project 6 = 55

With the lowest project score being dropped, the highest average score will be 54
Without the lowest project score being dropped, the highest average score will be 53.33

Reminder: Always check your pseudocode. -- Ambiguity? Does your pseudocode solve the problem? Does it handle the situation when some project scores are missing? Rewrite/revise?
Revisit Example from Last Meeting

Problem:
- A company is planning to have a storewide sale of 20%
- Sales tax is 5%
- You enter the price of an item based on the price tag
- Calculate the final sale price of an item after applying the discount and the sales tax
- Display the final sale price

Test:
- Item price = 100, work
- Item price = 0, not work
- Item price = -100, not work

1. Get item price
2. Apply 20% discount
3. Add 5% sales tax
4. Display final sale price
5. Display final sale price
Python

- Interpreted programming language

1. **Get** item price
2. **Check** if price is $\leq 0$, then **repeat** step 1
3. **Apply** 20% discount
4. **Add** 5% sales tax
5. **Display** final sale price

```python
price = 0
while price <= 0:
    price = int(input("Enter item price: "))
price *= 0.8
price *= 1.05
print(price)
```

Python interpreter
(Python 3.6)
Interpret at runtime

Executable version (.pyc)
PyCharm

- Integrated Development Environment