CSE2016 Programming Methodology

Week 1: Course Introduction

- Computers and Programming

Instructor: Jinyoung Han (jinyounghan@hanyang.ac.kr)

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Goal & Course Info

- Goal
  - Understanding Object-Oriented Programming
    - OOP = Object-Oriented Programming
  - Hands-on experience on Java programming

- Basic Language = English

- Prerequisite
  - CES1017 Programming Fundamentals

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Course Structure

- Lecture
  - A: Tuesday 11:00am ~ 13:00pm
  - B: Tuesday 13:00pm ~ 15:00pm
  - 학연산클러스터 302호

- Lab (led by TA)
  - A: Tuesday 15:00pm ~ 17:00pm
  - B: Tuesday 17:00pm ~ 19:00pm
  - 제4공학관 PC1실
  - You can leave as soon as you solve all the given problems
  - If you cannot solve the problems during lab hours, you can submit your solution to TA by 11:59pm.

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Teaching Assistant

- A반: Jiwon Kang (jiwonkang@hanyang.ac.kr)
- B반: Namkyu Lee (ynksit@empas.com)

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Office Hour

- Time: Wed 1:00pm – 3:00pm
- Location: 학연산클러스터 609호
- Appointment-based
  - Email: jinyounghan@hanyang.ac.kr
  - Tel: 031-400-1052

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Grading Policy

- Absolute evaluation
- Scores breakdown
  - Lecture attendance (10)
    - one absence -1, one late attendance -0.5
    - 2/3 attendances of classes are required, otherwise failed
  - Lab (20)
  - Quiz (10)
  - Midterm/Final (60)
    - Live coding exam

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No Cheating

- No submission is better than cheating
  - Zero Tolerance Cheating Policy
- Definition of cheating in this class
  - Knowingly or unknowingly participating in the submission of unoriginal work for any test (e.g., lab exercise, project)
  - Answer to roll-call instead of another student is also regarded as cheating
- Penalty
  - Assign a fail grade

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Resources

- Lecture notes
  - Will be uploaded to the portal
  - All the information will be given in the portal, so please check the portal frequently

- Reference material
  - Programming Principles in Java: Architectures and Interfaces, David A. Schmidt (Kansas State University)
  - Java – An Introduction to Problem Solving & Programming
  - 자바 프로그래밍 기초 (휴먼싸이언스)

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Tentative Schedule

수업일	내용
9/4	Course Introduction, Computers and Programming
9/11	Simple Java Applications
9/18	Arithmetic and Variables
9/25	Chuseok -- No Class
10/2	Input, Output, and State
10/9	Hangul Proclamation Day -- No Class
10/16	Component Structure: Method and Class Building
10/23	Control Structure: Conditional Statements
10/30	Patterns of Repetition: Iteration and Recursion
11/6	Midterm Exam
11/13	Data Structure: Arrays
11/20	Programming to Interfaces
11/27	Text & File Processing
12/4	Thread Programming
12/11	Reserved
12/18	Final Exam

Computers and Programming

Computer

- Computer?
  - Any entity that can execute instructions
    - E.g., calculators, PC, smart phone, …
- Computer components
  - Processor -- executes instructions
  - Main memory -- stores instructions and data
  - Etc. -- secondary memory, IO, …

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Program

- Program or Code
  - A list of instructions written in a precise style

```
sum=0;
for (i=1; i <= 100; i++)
{
        sum = sum + i;
}
```

- Algorithm
  - A sequence of declarative instructions for accomplishing a goal
  - Less precise than program

Increasing i from 1 to 100, and summing them up.

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Compile

- Translating a source code into machine language

Programming

Program Execution

```
if (i>0) {
        i = i*10;
}
i = i – j;
System.out.println(i);
```

Source code

Compiler

Compile

```
01010000010001
01010011110101
10101010010111
01010101010000
10001110000000
```

Binary codes

Compile for Java programs

- Two stages
  - Translate a Java program into a Java byte code
  - Java interpreter (also know an Java Virtual Machine, JVM) executes the Java byte code
- Good for portability

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Platform Dependency

Coding with
Linux + Intel CPU

C/C++
Program

Why?
- Machine language may be different for different hardware
- Different operating systems may have different APIs or execution processes

Intel CPU + Linux

Apple MAC PC

Intel CPU + Windows

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Java's Platform Independency

Write Once !!

Java Program

Run Anywhere!!

JVM

Intel CPU + Linux

JVM

Apple MAC PC

JVM

Intel CPU + Winwdows

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Software Development

- Design
  - Designing software architecture
  - Like an “architect” who design a house
- Implementation
  - Writing a code
  - Like a “builder” who actually builds a house

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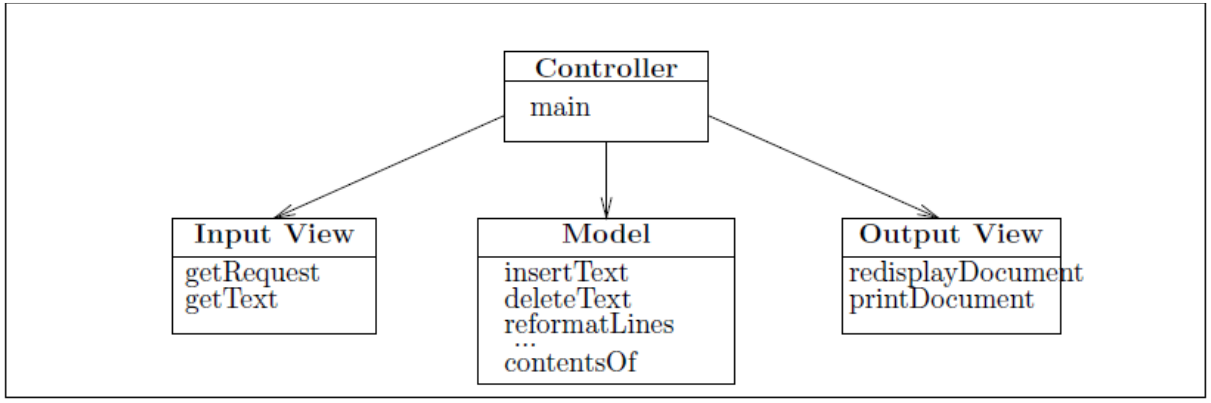
OOP

- Object-Oriented Programming (OOP)
  - One of the programming paradigm
  - Objects and their methods
- An example of a class diagram for a word processor (with an MVC architecture)



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Good Programmer

- Good programmer
  - Not just a coder
  - A good designer or architect

- How to become a good programmer
  - Learning and understanding how to “design” a software
  - Hands-on experiences in programming

Thanks

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