



cosc 111 Computer Programming I

Midterm Exam 1 Revision

Midterm

Date: Thu, May 27

Time: 8:30 am PDT

Duration: 75 minutes + 38 min for technical issues/break

Structure: online Canvas Quiz: MCQs, analysis and coding questions

Process: Connect your camera. Go to Canvas → Zoom → COSC 111 Lecture There you will receive a passcode, cheat sheet and instructions.

Cheat-sheet: Provided on Zoom screen.

Invigilation

- Live invigilation through Zoom
- You MUST try your system on the mock exam before the actual exam
 - to make sure everything works as expected.

Midterm #1: Format

2 marks on 2 multiple choice questions

8 marks on 7 Analyse questions based on a given Java code. e.g.,

- "What is the output?"
- "Find in given Java code".
- Trace the code, understand each statement.

3 marks for 1 short coding questions

- e.g., "write an 'if' statement that does a specific task".
- Not required to write complete program

12 marks for two long coding-question.

- e.g., "Write a complete Java program that prompts the user for an input and then displays some results"
 - When writing a complete program, you must include all Java statements starting from the import statement

What have we learned in Ch1 to Ch5?

Theoretical background:

- Hardware vs. Software,
- software development process,
- Types of programming errors: Logic, Runtime, Syntax
- Variables, constants, and data types.
 - Naming convention, data casting (explicit and implicit)
- Displaying output using println(), print(), printf()
- Reading input using Scanner methods

Operators:

- assignment, mathematical, logical
- How to write or evaluate an expression

Predefined Java classes and their methods

- Math class (e.g. sqrt(),pow(),sin(),random(),etc)
- Character class (e.g. isDigit(),isUpperCase(),etc)
- String class (e.g.length(),charAt(),indexOf(),etc)

Selection using if, switch, ? (conditional expression)

Loops using while, do-while, for

Exam Structure

MCQ

Code analysis

Short coding

Long coding

Sample Analysis Question: What is the output?

What is the output of the following code? Justify your answer

Exam Structure

MCQ

Code analysis

Short coding

Long coding

Sample Analysis Question: Find and Fix Errors

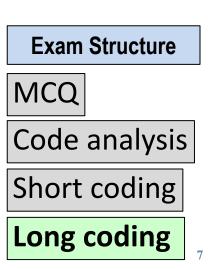
Identify and fix the errors in the following code:

```
Scanner in = new Scanner(System.in
System.out.print(Is today Thursday (Yes/No)?
String answer = in.nextInt();
if(answer == "Yes");
    system.out.println("Correct");
                                          Exam Structure
                                         MCQ
else System.out.println["Wrong!(
                                         Code analysis
                                         Short coding
                                         Long coding
```

Write a program that prompts the user to enter two characters and displays the major and status represented in the characters.

- The first character indicates the major. Suppose the following characters are used to denote the majors:
 - M: Mathematics
 - C: Computer Science
 - I: Information Technology
- The second character is numeric character 1, 2, 3, 4, which indicates whether a student is a first, a second, a third, or a fourth year.

Assume the user enters valid input



Practice Question 3 – solution

```
import java.util.Scanner;
public class Test {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        System.out.print("Enter two characters: ");
        String s = input.nextLine();
        char ch1 = s.charAt(0), ch2 = <math>s.charAt(1);
        if(ch1 == 'M')System.out.print("Math, ");
        else if(ch1 == 'C')System.out.print("CompSci, ");
        else if(ch1 == 'I')System.out.print("InfoTech, ");
        else System.out.print("Invalid Major ");
        if(ch2 == '1')System.out.print("First Year");
        else if(ch2 == '2')System.out.print("Second Year");
        else if(ch2 == '3')System.out.print("Third Year");
        else if(ch2 == '2')System.out.print("Fourth Year");
        else System.out.print("Invalid Year");
        System.out.println(" Student");
```

Rewrite your code from Question 3 using switch statement instead of if statement.

Add code to Practice Question 3 in order to check the validity of the user's input using if statement. That is, make sure that:

- the length is 2 characters.
- the first character is a letter.
- the second character is a digit.

Exam Structure

MCQ

Code analysis

Short coding

Long coding

Write a program that reads a monetary value as a string, e.g., "11.56". Your program should extract the dollar amount before the decimal point and the cents after the decimal amount using the indexOf and substring methods.

Restriction: you cannot convert to double and use % or /

Notes:

- Assume user enters valid monetary amount
- Your code should be able to handle the three different amounts below:
 - Dollars with cents. For example:
 - Input: 15.75 Output: Dollars: 15 Cents: 75
 - Dollars with NO cents
 - Input: 15 Output: Dollars: 15 Cents: 0
 - Cents with No Dollars
 - Input: .75 or 0.75 Output: Dollars: 0 Cents: 75

Exam Structure

MCQ

Code analysis

Short coding

Long coding

Practice Question 5 – solution

```
import java.util.Scanner;
public class Q4 {
 public static void main(String[] args) {
 Scanner in = new Scanner(System.in);
 System.out.print("Enter the amount: ");
 String x = in.nextLine();
 int dollars = 0, cents = 0; // assume amount = 0.0
 int idx = x.indexOf('.');  // get location of decimal
 point
 switch(idx) {
  case -1: // no decimal, e.g.: 15 -> dollars=15, cents=0
    dollars = Integer.parseInt(x); break;
  case 0: // no dollars, e.g.: .75: dollars=0, cents=75
    cents = Integer.parseInt(x.substring(1)); break;
  default: // dollars and cents, e.g.: 15.75
    dollars = Integer.parseInt(x.substring(0, idx));
    cents = Integer.parseInt(x.substring(idx + 1));
 System.out.printf("Dollars: %d\tCents: %d\n", dollars,
 cents);
```

Can you add code to Practice Question 5 in order to check the validity of the user's input using if statement.

Loops are part of this midterm exam. You can use them if you wish, but you don't have to solve the question (the mark won't be reduced).