

# CPS 101: COMPUTER PROGRAMMING I

Mid-term Exam

Alfusainey Jallow & Lamin Saidy

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## Instructions

Please answer all questions. There are a total of nine (8) questions, divided into general and problem set questions. The general questions and the problem set questions are worth 60 respectively 40 points.

– *Good Luck!*

## General Questions (60 points)

1. Explain the difference between an object and a class. (5 pts)
2. Explain the difference between an object and an object reference. (5 pts)
3. What is encapsulation? Why is it useful? (10 pts)
4. What does the following method do? Give an example of how you can call the method. (10 pts)

```
1 public class BankAccount {
2
3     public void mystery(BankAccount that, double amount) {
4         this.balance = this.balance - amount;
5         that.balance = that.balance + amount;
6     }
7
8     . . . // Other bank account methods
9
10 }
```

5. (15 pts). Explain the difference between

```
1 s = 0;
2 if (x > 0) s++;
3 if (y > 0) s++;
```

and

```
1 s = 0;
2 if (x > 0) s++;
3 else if (y > 0) s++;
```

6. Explain the difference between an if statement with multiple else branches and nested if statements. Give an example for each. (15 pts)

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## Problem Set (40 points)

1. Write a program that computes the average of the first ten positive integers,  $1 + 2 + \dots + 10$ . (20 pts)

Hint: Use a loop to compute the sum. You can use the method structure provided below as starting point.

```
1 private int computeAverage() {
2     int average = 0;
3
4     // compute the average here
5
6     return average;
7 }
```

2. Write pseudocode for a program that prompts the user for a month and day and prints out whether it is one of the following four holidays observed in the Gambia: (20 pts)

- Worker's Day (May 1)
- Independence Day (February 18)
- Second Republic (July 22)
- Christmas Day (December 25)