

## CS2420

## Assessment Exam

**Purpose:** To assess your familiarity with JAVA and fundamental object oriented concepts. This exam will not be graded.

**Instructions:** Answer each question as completely as you can.

## Basic Java

1. What is bytecode?
2. What does the JVM do?
3. What are the five arithmetic operators JAVA offers?
4. What is the difference between = and ==?
5. How does the conditional operator (?:) work?
6. Write a nested if statement.
7. What are the two different types of while loops?

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7. What are the two different types of while loops?

8. Write a for loop that executes 23 times, outputting to the screen the value of the control variable on a separate line during each iteration.
9. Give an example of an exit test loop and an entry test loop.
10. What is the break statement used for?
11. What are the symbols for the logical AND, OR and NOT operators?
12. Write a method that returns the larger of three integer values passed as arguments.
13. Write a statement that calls the method you wrote in question 12.
14. Write the statement(s) to declare an array of 10 integers and initialize it with the even numbers from 2 to 20.

## Objects

15. Define the following terms:

1. class
2. object
3. instantiate
4. encapsulation
5. data abstraction
6. instance variable
7. inheritance
8. composition
9. polymorphism

16. What is the purpose of the class constructor method(s)?

17. How do static class variables differ from other class variables?

18. What is the purpose of an abstract class?

## Exception Handling

19. What is an exception?
20. Describe the purpose of each block:
1. try
  2. catch
  3. finally

## Files and Streams

21. Given the following declarations:
- ```
int age;  
Scanner input = new Scanner( System.in );
```
- write a statement to assign a value to age from keyboard input.
22. Explain the difference between binary files and text files.

23. Describe what the following program does:
- ```
import java.util.*;  
import java.io.*;  
  
public class NamesFilter  
{  
    public static void main(String[] args)  
        throws FileNotFoundException  
    {  
        Scanner sc = new Scanner (new File(args[0]));  
        PrintWriter pw = new PrintWriter(new File(args[1]));  
        while(sc.hasNext())  
        {  
            String fname = sc.next();  
            String lname = sc.next();  
            pw.println(lname + "," + fname);  
        }  
        pw.close();  
    }  
}
```

## UML

24. Define the purpose of the following UML diagrams

1. Use case

2. Activity

3. Sequence/collaboration

4. Class

25. Draw a class diagram for a Person class with String variables for first name and last name and an integer variable for age. Include a default constructor, parameterized constructor, and set and get methods for all class variables.

## GENERICS

26. Write a generic method header that accepts three values all of the same type and returns the largest of the three.

27. Explain the use of the following notation in a Java program

```
public class Array< T > {}
```

28. Explain why a Java program might use this statement:

```
ArrayList< Employee > workerList = new ArrayList< Employee >();
```