
CS 115
Final Exam

Name:

Student ID

Total Points: 100

1. Answer the following Multiple-Choice and fill in the blank questions. (40 Points)

- I. Invoking a constructor of `java.io.File` class creates a file on the file system.
 - a. True
 - b. False
- II. Select true statement(s) about native modifier.
 - a. native modifier can be applied to a class
 - b. native modifier can be applied to a method
 - c. native modifier can be applied to an instance variable
 - d. native variable can be applied to a class variable
- III. What method(s) needed to be declared by a class implementing runnable interface?
 - a. `public void start()`
 - b. `public void run()`
 - c. `public boolean start()`
 - d. `public boolean run()`
- IV. The priority of a newly created thread is always thread: `Norm_Priority`
 - a. True
 - b. False
- V. What methods are declared in `java.lang.Thread` class?
 - a. `public static void sleep(long millis, int nanos)`
 - b. `public static native void sleep(long millis, int nanos)`
 - c. `public static native void sleep(long millis)`
 - d. `public static void sleep(long millis)`
- VI. A *yield* method of the `Thread` class suspends the operation of the current thread.
 - a. True
 - b. False
- VII. What methods are NOT synchronized in `java.util.Vector` class?
 - a. `size()`
 - b. `add(int index, Object element)`
 - c. `capacity()`
 - d. `get(int index)`

- VIII. Select unchecked exception(s)?
- a. `java.lang.NullPointerException`
 - b. `java.lang.ClassNotFoundException`
 - c. `java.lang.ClassCastException`
 - d. `java.awt.AWTException`
- IX. Which of the following declarations are valid to throw an exception?
- a. `throw new java.lang.Exception();`
 - b. `throws new java.lang.Exception();`
 - c. Both of the above
 - d. None of the above
- X. Which of the following classes are immutable?
- a. `java.lang.String`
 - b. `java.lang.StringBuffer`
 - c. `java.util.Vector`
 - d. `java.lang.Integer`
- XI. Which of the following classes store and retrieve values based on a key?
- a. `java.util.Hashtable`
 - b. `java.util.Vector`
 - c. `java.util.LinkedList`
 - d. `java.util.HashMap`
- XII. Which of the following classes can store null value for a key?
- a. `java.util.Hashtable`
 - b. `java.util.HashMap`
 - c. `java.util.Properties`
 - d. All of the above
- XIII. _____ ensures that a local identifier takes precedence over a class identifier with the same name
- a. shadowing
 - b. polymorphism
 - c. scope
 - d. encapsulation
- XIV. Fields marked _____ are available to all external code.
- a. `Public`
 - b. `private`
 - c. `protected`
 - d. `package`

- XV. What is the parameter type for method addActionListener?
- a. Container
 - b. JButton
 - c. JLabel
 - d. A class that implements ActionListener
- XVI. Write the statement(s) to declare and instantiate a char array of twenty components.
- a. `char myArray = new char(20);`
 - b. `char [] myArray = new char(20);`
 - c. `char myArray = new char[20];`
 - d. `char myArray [] = new char[20];`
- XVII. Fields marked private are available to all classes in the same package.
- a. True
 - b. False
- XVIII. A value of a variable must be defined before it is used in an expression that initializes another variable as part of its declaration.
- a. True
 - b. False
- XIX. A(n) _____ class is one from which another class is derived
- a. Interface
 - b. Abstract
 - c. Superclass
 - d. Subclass
- XX. A(n)_____ is a class that is derived from another class.
- a. Interface
 - b. Aabstract
 - c. Superclass
 - d. Subclass

2. Discuss the similarities and differences between recursion and Iterations (5 Points).

3. What kind of errors do exception statement handle? Also give two examples of situations when exception handling is needed? (10 Points)

4. Write a program using the File Reader / File Writer to copy the contents of the file "test.in" to the file "answer.out". (20 points)

5. Write a complete Java application that reads all lines of the text file input.txt and echoes them to the screen after removing all blank characters. The file processing should be done in a try-catch block so that IOException is handled. (25 Points)

The file input.txt contains the following data

 This is the file input.txt.

 It contains 3 lines.

 This is the last line.

If input.txt is present, the output of the program should look like this:

 Thisisthefileinput.txt.

 Itcontains3lines.

 Thisisthelastline.

If input.txt is not present, the output should look like this:

 Error processing file input.txt

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Final Exam Solution

1. Answer the following Multiple-Choice and fill in the blank questions.

- I. B
- II. B
- III. B
- IV. B
- V. A and C
- VI. A
- VII. A, B, and C
- VIII. A and C
- IX. A
- X. A and D
- XI. A and D
- XII. B
- XIII. Shadowing
- XIV. Public
- XV. D
- XVI. B
- XVII. False
- XVIII. True
- XIX. Superclass
- XX. Subclass

2. Discuss the Similarities and Differences between recursion and Iterations.

Iteration uses a repetition statement (for, while, or do... while); whereas recursion uses a selection statement (if, if-else, switch).

Both involves termination testing – iteration terminates when the loop-continuation condition fail; In contrast, recursion keeps producing simpler versions of the original problem until the base case is reached

3. What kind of errors do exception statement handle? Also give two examples of situations when exception handling is needed?

Exception statements handle synchronous errors. Following are the examples of situations when exception handling is needed.

- ☐ Division by Zero
- ☐ Out of range indices

- Unsuccessful memory allocations

4. Write a program using the File Reader and File Writer to copy the contents of the file “test.in” to the file “answer.out”.

```
import java.io.*;

public class Copy {
    public static void main(String[] args) throws IOException {
        File inputFile = new File("test.in");
        File outputFile = new File("answer.out");

        FileReader in = new FileReader(inputFile);
        FileWriter out = new FileWriter(outputFile);
        int c;
        while ((c = in.read()) != -1)
            out.write(c);

        in.close();
        out.close();
    }
}
```

5. Write a complete Java application that reads all lines of the text file input.txt and echoes them to the screen after removing all blank characters. The file processing should be done in a try-catch block so that IOException is handled.

```
import java.io.*;

public class Problem100
{
    public static void main(String[] args)
    {
        BufferedReader inData;
        try
        {
            inData = new BufferedReader(new FileReader("input.txt"));
            String line;
            line = inData.readLine();
            while (line != null)
            {
                for (int i = 0; i < line.length(); i++)
                {
                    if (line.charAt(i) != ' ')
                    {
                        System.out.print(line.charAt(i));
                    }
                }
            }
        }
        catch (IOException e)
        {
            e.printStackTrace();
        }
    }
}
```

```
        }  
    }  
    System.out.println("");  
    line = inData.readLine();  
}  
}  
catch (IOException e)  
{  
    System.out.println("Error processing file input.txt");  
}  
}  
}
```