CS-1331-O1 Exam 1

Vidit Dharmendra Pokharna

TOTAL POINTS

83.5 / 101

QUESTION 1

1 Q1 **2 / 2**

✓ **- 0 pts** *Correct: A*

- 2 pts Incorrect answer

QUESTION 2

2 Q2 **1.5 / 2**

- 0 pts Correct

`final double PI = 3.14;`

- 1 pts Missing final keyword, missing variable name, or any incorrect modifiers

✓ **- 0.5 pts** *Minor syntax error: capitalization*

- 2 pts Incorrect/missing

QUESTION 3

3 Q3 **0 / 4**

- 0 pts Correct explanation(s)

- program2 and program3 are aliases of each other, as they are in the String constant pool
- program1 has been instantiated via the 'new' operator and is located in a separate place in memory
- Demonstrating the equality operator returning true if variables are aliases (program2 == program3)

- 1 pts Minor incorrect statement (but explanation is overall correct)

- 1.5 pts Partial credit for incorrectly stating all 3 are aliases but demonstrates knowledge of string interning

- 2.5 pts Partial credit for incorrectly stating all 3 are in separate parts of memory, not mentioning string constant pool

✓ **- 4 pts** *Incorrect*

QUESTION 4

4 Q4 **0 / 2**

- 0 pts Correct: D

✓ **- 2 pts** *Incorrect*

QUESTION 5

5 Q5 **2 / 2**

✓ **- 0 pts** *Correct: E (second d in paper, typo), none of the above*

- 2 pts Incorrect

QUESTION 6

6 Q6 **5 / 5**

✓ **- 0 pts** *Correct*

- String array contains a null element. Calling the equals() method without checking null will lead to NullPointerException

- A null check is needed before invoking a method on an element

- 1 pts Minor incorrect statement (but explanation is overall correct)

- 2.5 pts Missing explanation on why having a null element would lead to an error in this situation, as it is perfectly OK to have null within an array

- **5 pts** Incorrect/missing

QUESTION 7

7 Q7 **0 / 2**

- **0 pts** Correct: compiler error

✓ **- 2 pts** *Incorrect*

QUESTION 8

8 Q8 **2 / 2**

✓ **- 0 pts** *Correct: no error*

- **2 pts** Incorrect

QUESTION 9

9 Q9 **1.5 / 2**

- **0 pts** Correct

false, boolean

✓ **- 0.5 pts** *Minor capitalization or spelling error OR primitive type name is not exact*

- **1 pts** Incorrect type or value

- **2 pts** Incorrect/missing

QUESTION 10

10 Q10 **2 / 2**

✓ **- 0 pts** *Correct*

1, int

- **0.5 pts** Minor capitalization or spelling error OR primitive type name is not exact

- **1 pts** Incorrect type or value

- **2 pts** Incorrect/missing

QUESTION 11

11 Q11 **2 / 2**

✓ **- 0 pts** *Correct*

9.0, double

- **0.5 pts** Minor capitalization or spelling error OR primitive type name is not exact

- **0.5 pts** Computed value does not include a decimal place to signify double

- **1 pts** Incorrect type or value

- **2 pts** Incorrect/missing

QUESTION 12

12 Q12 **6 / 6**

✓ **- 0 pts** *Correct, sample solution:*

`int i = 0;

while (i < 500) {

x += i;

i++;

}`

- **2 pts** Missing/incorrect initialization of incremented variable

- **1.5 pts** Missing/incorrect loop termination condition

- **1.5 pts** Missing/incorrect operation within loop

- **2 pts** Missing/incorrect variable update

- **0.5 pts** Minor syntax error (semicolons, brackets, etc.)

- **6 pts** Missing/incorrect

QUESTION 13

13 Q13 **2 / 2**

✓ **- 0 pts** *Correct: 15*

- **2 pts** Incorrect

QUESTION 14

14 Q14 **4.5 / 6**

✓ **- 0 pts** *Correct, sample solution:*

`if (capitalCity.equals(largestCity)) {
System.out.println("Match found");
}`

- 3 pts Missing/incorrect conditional

✓ **- 1.5 pts** *Partial credit: Compares String values via == OR Incorrect usage syntax of equals() method*

- 3 pts Missing print statement containing "Match found"

- 0.5 pts Minor syntax error

- 6 pts Incorrect/missing

1 Should have been case sensitive comparison

QUESTION 15

15 Q15 **2 / 4**

- 0 pts Correct

✓ **- 2 pts** *Provides getters/setters, which do not represent behaviors*

- 4 pts Incorrect/missing -- Each class member is 1 point (submission specific adjustments as needed)

- 0 pts NOTE: While we originally intended a class about a student attending a career fair, we accepted submissions regarding a career fair in itself

QUESTION 16

16 Q16 **11.5 / 12**

- 0 pts Correct
`for` `array2d[0].length`
`for` `array2d.length`
`row` `col` `&&` `row` `col`

- 1.5 pts Assumes square array (row and col the same size)

- 1 pts Accesses array length using length()

✓ **- 0.5 pts** *Does not use array reference provided in question*

- 2 pts Switched order of row and col when indexing into array

- 12 pts Incorrect/missing -- Each incorrect blank is worth 1.5 points (submission specific adjustments as needed)

2 minor error in refering to array instead of array2d

QUESTION 17

17 Q17 **8 / 8**

✓ **- 0 pts** *Correct, sample solution:*
`if (num == 2) {
System.out.println("Small");
} else if (num == 3) {
System.out.println("Medium");
System.out.println("Large");
} else if (num == 4) {
System.out.println("Large");
} else {
System.out.println("Unknown Size");
}`

- 1.5 pts Missing print output of "Large" when num == 3

- 2 pts Missing a case

- 3 pts Incorrect conditions for `if` and `else if`

Miscellaneous errors involved in if-else

- 0.5 pts `elif` rather than `else if`

- 1 pts Incorrect use of 'break' within if-else

- 1 pts Use of colons rather than brackets to separate cases

- 1 pts Includes any extra constructs such as loops

- **1 pts** Includes a condition for `else` part
- **1 pts** Extra print statements
- **1 pts** Compares num incorrectly
- **0.5 pts** Minor syntax error: Missing braces, parentheses, etc.
- **8 pts** Incorrect/missing

QUESTION 18

18 Q18 **17 / 20**

✓ **- 0 pts** *Correct, sample solution:*

```
`import java.util.Scanner;
public class ParkingMeter {
public static void main(String[] args) {
final int COST_PER_HR = 2;
Scanner input = new Scanner(System.in);
System.out.print("What parking spot are you in? ");
int parkNum = input.nextInt();
System.out.print("How many hours? ");
double hours = input.nextDouble();
double cost = hours * COST_PER_HR;
System.out.printf("\nPay $%.2f for spot %d please.", cost, parkNum);
}
}`
```

Imports, class header, main method header

- **1 pts** Missing/incorrect Scanner import
- **1 pts** Error in class header
- **1 pts** Error in main method header

✓ **- 1 pts** *Constant COST_PER_HR is a class member but is not static*

- **1 pts** Scanner is a class member but is not static

Scanner usage

- **2 pts** Scanner not instantiated to accept user input
- **1 pts** Scanner instantiated incorrectly / multiple Scanner objects created
- **2 pts** Missing user input prompts
- **1 pts** User input prompts are incorrectly formatted (extra newline or missing space)
- **2 pts** Incorrect next() method used to retrieve appropriate typed value
- **2 pts** Scans occur before requesting input from user

Calculation and output

- **1.5 pts** Constant is not/incorrectly declared
- **2 pts** Calculation is incorrect
- **1.5 pts** Incorrect specifier for floating point or int value OR invalid concatenation within printf
- **1 pts** Missing dollar sign
- **1 pts** Output is not displayed with 2 decimal digits
- **2 pts** Output does not include parking spot number
- **2.5 pts** None of the required formatting options used / completely incorrect use of formatting option
- **0.5 pts** Minor syntax error: Capitalization, spelling, brackets, etc.
- **20 pts** Incorrect/missing

- 2 *Point adjustment*

[-1.0] Missing import for DecimalFormat
[-1.0] Partially incorrect use of DecimalFormat

3

DecimalFormat requires import java.text.*;

4 cost is a double, cannot assign a string to it

QUESTION 19

19 Q19 13.5 / 15

- **0 pts** Correct, example solutions:

```
`public static boolean partTheC(String str) {
if (!str.contains("C") && !str.contains("c")) {
return false;
}
String newStr = str.replace('C', '_');
newStr = newStr.replace('c', '_');
System.out.println(newStr);
return true;
}`

`public static boolean partTheC(String str) {
String newStr = str.replace('C', '_').replace('c', '_');
if (!newStr.equals(str)) {
System.out.println(newStr);
return true;
}
return false;
}`
```

Print output

- **1.5 pts** Incorrect logic to detect whether a word contains C
- **1.5 pts** Does not replace both uppercase and lowercase C's
- **1.5 pts** Attempts to index into input String similar to arrays
- **1.5 pts** Performs additional operations outside of replacing the C's
- **1 pts** Missing printed result after replacing letters
- **1.5 pts** Any extra print statements

Method header

✓ **- 1 pts** *Not static*

- **1 pts** Does not return boolean
- **1 pts** Incorrect method name
- **1 pts** Does not accept 1 String typed parameter OR formal parameter not used in body of method

Return value

- **2 pts** Does not return true when replacing letters
- **2 pts** Does not return false when no modifications are made

✓ **- 0.5 pts** *Minor syntax error*

- **15 pts** Missing/incorrect

QUESTION 20

20 Signature / EC 1 / 1

✓ **- 0 pts** *Correct*

- **1 pts** Missing

CS 1331 – Test 1

Fall 2022

Name: Vidit Pokharna Section: 01 GTID: 903772087

GT username (prism email (i.e. gtg, gth, msmith3, not an alias)): vpokharna3

By taking this exam, you signify that it is your work and that you have neither given nor received inappropriate help during the taking of this exam in compliance with the Academic Honor Code of Georgia Tech.

Signature: viditpokharna
(you must sign this for your exam to be graded.)

Note

This is an object-oriented programming test. Java is the required language. Java is case-sensitive. DO NOT WRITE IN ALL CAPS. A Java program in all caps will not compile. Good variable names are required. Comments are not required.

Check to make sure your exam has 6 pages. Each page has its number and the total number of pages on the bottom left corner. Your exam will be graded as submitted

1) The new operator: [2pts]

[✓ (a) allocates memory]
(b) is a method
(c) is a type
(d) none of the above

2) Declare a double constant for PI. Use 3.14 as the value. [2pts]

final double pi = 3.14;

3) Describe the differences (if any) between the values of the three variables below after execution? [4pts]

```
String program1 = new String("CREATE-X");
String program2 = "CREATE-X";
String program3 = "CREATE-X";
```

There are no differences between all three values after execution.

4) What is the value of `myMajor` after the following line of code is executed within a main method? [2pts]

```
String myMajor;
```

[✓ (a) null]
(b) address of a String object
(c) automatically set to the empty String
(d) `myMajor` is undefined

5) Assume you have the following variable declaration:

```
final int numHWdropped = 1;
```

Which one line of code below is legal? [2pts]

(a) `numHWdropped++;`
(b) `numHWdropped = (float)1;`
(c) `numHWdropped = 8;`
(d) all of the above
[✓ (d) none of the above]

6) On the space to the right, describe why the following code generates an error? [5pts]

```
public class TestQuestion {
    public static void main(String[] args) {
        String[] seasonsIlike = new String[4];
        seasonsIlike[0] = "spring";
        seasonsIlike[2] = "summer";
        seasonsIlike[3] = "early autumn";
        String result = "don't like";
        for (String season : seasonsIlike ) {
            if (season.equals("summer") ) {
                result = "found";
                break;
            }
        }
        System.out.println(result);
    }
}
```

Because seasonsIlike[1] has a null value and checking in the for each loop will cause an error, through the if statement, as the if statement does not check if the String is a null or not.

Evaluate each statement in questions 7 and 8 and determine whether it will lead to either a **compiler error**, **runtime error**, or **no error**. Use the space next to each line to enter one of the three bolded options. [2pts each]

7) runtime error `int height = (int)(15.5/2) + 2d;`

8) no error `double solution = (6.0 / 4.0) / 2.0 + "syllabus".indexOf("la");`

What is the resulting **value** and **primitive type** after evaluating the following expressions? Be exact. The type you give must be the exact name of a Java primitive type. I want to see if you know the primitive types in Java. [2pts each]

false || true && false

9) `(true && false) || true && (false || !true)`

Computed Value: False

Java Type: Boolean

10)

`3/2 - 2/3`

Computed Value: 1

Java Type: int

11)

`(9.0/3) * 3`

Computed Value: 9.0

Java Type: double

12) Rewrite the following for loop as an equivalent while loop. [6pts]

```
for (int i = 0; i < 500; i++) {
     x += i;
}
```

```
int a = 0
while (a < 500) {
     x += a;
     a++;
}
```

13) What is x after the for loop below terminates? [2pts]

```
int x = 5;
for (int i = 0; i < 5; i++) {
     x += i;
}
```

5+1+2+3+4 = $\boxed{15}$

14) You're writing code that has access to two String variables capitalCity and largestCity. Write an if statement that prints the words "Match found" if the contents characters of the two strings are the same. Your solution should contain no more than 3 lines. [6pts]

```
if (capitalCity.toLowercase().equals(largestCity.toLowercase())) {
    System.out.println("Match found");
}
```

15) You're writing a class named CareerFairStudent. Provide the names of 2 variables and 2 methods that could be used to represent the sate and behaviors of CareerFairStudents. Label which are variables and which are methods. Make sure your names are descriptive enough to express what they represent. If not, provide short descriptions. Note that there is no coding here. [4pts]

Variables

Boolean isStressed → variable to see whether student is stressed

int numOfCompaniesMet
↳ number of companies the student met

Methods

public Boolean isStressed ↱ returns if student is stressed or not

public int numOfCompaniesMet
↳ returns number of companies a student met

16) Fill in the nine blanks of the following code so that it performs a column-major traversal on a rectangular and non-empty array of double temperatures called array2d. Assume that array2d and all constants are already declared and initialized. [12pts]

```
for (int col = 0; col < array2d[0].length; col++) {
    for (int row = 0; row < array2d.length; row++) {
        if ((array2d[row][col] >= MIN_TEMP) && (array2d[row][col] <= MAX_TEMP)) {
            System.out.println("Go to the park.");
        }
    }
}
```

17) On the space below on the right, rewrite the following code so that it does not use any switch statements. [8pts]

```
switch(num) {
  case 2:
    System.out.println("Small");
    break;
  case 3:
    System.out.println("Medium");
  case 4:
    System.out.println("Large");
    break;
  default:
    System.out.println("Unknown Size");
}
```

```
if(num==2){
    System.out.println("Small");
}else if(num==3){
    System.out.println("Medium"),
    System.out.println("Large");
}else if(num==4){
    System.out.println("Large");
}else{
    System.out.println("Unknown size");
}
```

18) Write a class named ParkingMeter that has a main method that prompts a car owner for a parking spot and the number the number of hours the owner wants to park a car. You are to assume that parking costs $2/hr. The main method calculates the total cost owed by multiplying the number of hours requests times the cost per hour. [20pts]

Here are some of the steps/requirements:

a) Store the cost per hour as a constant called COST_PER_HR in your program.

b) Prompt the user (as shown below) for the parking spot number (and int) and the desired time period (a double).

c) Read in the numbers using a single Scanner object.

d) Calculate the parking cost. (Assume there is no discount and no tax. Be sure to use your constant in the calculation!)

e) Display the calculated cost using the exact wording as shown below including the dollar sign and two post-decimal digits. You're required to use NumberFormat, DecimalFormat, or printf for formatting.

Example (our program execution/output should look **exactly** list this):

```
What parking spot are you in? 5
How many hours? 3.25

Pay $6.50 for spot 5 please.
```

// Add any import statements you need, the Class header, and the main method.

```
import java.util.*;
public class ParkingMeter {
    final int COST_PER_HR = 2:
        public static void main (String[] args) {
            Scanner scan = new Scanner(system.in);
            System.out.print("What parking spot are you in? ");
            int spot = scan.nextInt();
            System.out.print("How many hours? ");
            double hours = scan.nextDouble();
            Decimal Formatter format = new DecimalFormatter(".00");
            double cost = hours * COST_PER_HR;
            cost = format.format(cost);
            System.out.println("\n Pay $"+ cost + " for spot "+ spot + " please.");
    }
```

19) Write a java method (not a complete program) called partTheC that takes a String and returns a boolean. The method replaces any upper or lower case c in the String with the underscore character; i.e, _. If and only if a change was made to the input String, the method will print the newly version of the String and return true. Otherwise, the method prints nothing and returns false. [15pts]

For example:
`partTheC("Character")` should result in the following output and a true return value:
`_hara_ter`

```
public Boolean partTheC( String given) {
    Boolean change = false;
    String new = "";
    for(int a = 0; a < given.length(); a++){
        if( given.charAt(a) == 'c' || given.charAt(a) == 'C' ){
            new += "_";
            change = true;
        } else {
            new+=(""+ given.charAt(a));
        }
    }
    if(change == true){
        System.out.println(new);
    }
    return change;
}
```

20) Make sure your exam has all the pages. Sign below to confirm your exam has all 6 pages. [1pt EXTRA CREDIT]

viditdpokharna

Check to make sure your exam has 6 pages. Each page has its number and the total number of pages on the bottom left corner. Your exam will be graded as submitted