

Unit 1 – ICS3U0 – Introduction to Java

Sample Test, Thursday February 21, 2024

Name: Gorski

Total	%	Knowledge	Communication	Thinking	Application
(92)	%	(28)	(22)	(21)	(21)

Knowledge

1. Answer the following questions:

/6

	Instruction	Data	Answer																									
(a)	Translate from our number system to binary.	18	<table style="border-collapse: collapse; margin-left: auto; margin-right: auto;"> <tr><td style="padding: 0 5px;">16</td><td style="padding: 0 5px;">8</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">1</td></tr> <tr><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">1</td></tr> </table>	16	8	4	2	1	1	0	0	1	1															
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(b)	Translate to binary.	B (which is 66)	<table style="border-collapse: collapse; margin-left: auto; margin-right: auto;"> <tr><td style="padding: 0 5px;">64</td><td style="padding: 0 5px;">32</td><td style="padding: 0 5px;">16</td><td style="padding: 0 5px;">8</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">1</td></tr> <tr><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td></tr> </table>	64	32	16	8	4	2	1	1	0	0	0	0	1	0											
64	32	16	8	4	2	1																						
1	0	0	0	0	1	0																						
(c)	Translate from Unicode to binary. A 10 B 11 C 12 D 13 E 14 F 15	1439 <	<table style="border-collapse: collapse; margin-left: auto; margin-right: auto;"> <tr><td style="padding: 0 5px;"></td><td style="padding: 0 5px;">8</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">1</td></tr> <tr><td style="padding: 0 5px;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td></tr> <tr><td style="padding: 0 5px;">4</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td></tr> <tr><td style="padding: 0 5px;">3</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">1</td></tr> <tr><td style="padding: 0 5px;">9</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td></tr> </table>		8	4	2	1	1	0	0	0	1	4	0	1	0	0	3	0	0	1	1	9	1	0	0	1
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1	0	0	0	1																								
4	0	1	0	0																								
3	0	0	1	1																								
9	1	0	0	1																								
(d)	Translate from binary to hexadecimal.	<table style="margin-left: auto; margin-right: auto;"> <tr><td style="padding: 0 5px;">8</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">8</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">1</td></tr> <tr><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td></tr> </table>	8	4	2	1	8	4	2	1	1	0	1	0	1	1	1	0	AE									
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(e)	Translate from hexadecimal to binary.	<table style="margin-left: auto; margin-right: auto;"> <tr><td style="padding: 0 5px;">B</td><td style="padding: 0 5px;">5</td></tr> </table>	B	5	<table style="border-collapse: collapse; margin-left: auto; margin-right: auto;"> <tr><td style="padding: 0 5px;"></td><td style="padding: 0 5px;">8</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">1</td></tr> <tr><td style="padding: 0 5px;">B</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">1</td></tr> <tr><td style="padding: 0 5px;">5</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td><td style="border: 1px solid black; text-align: center;">0</td><td style="border: 1px solid black; text-align: center;">1</td></tr> </table>		8	4	2	1	B	1	0	1	1	5	0	1	0	1								
B	5																											
	8	4	2	1																								
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(f)	What letter is this ASCII?	<table style="margin-left: auto; margin-right: auto;"> <tr><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">0</td><td style="padding: 0 5px;">0</td><td style="padding: 0 5px;">0</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">1</td></tr> </table>	1	0	0	0	1	1	1	1	G																	
1	0	0	0	1	1	1	1																					

2. If x is 8 and y is 2, evaluate the following. (circle the correct answer)

/8

- True False Error a) $!(x \geq y)$ True False Error e) $x \% 2 == 0$ even ✓
- True False Error b) $1 < x < 5$ should be $x > 1 \ \&\& \ x < 5$ True False Error f) $(x > 2) \ \&\& \ (x < 10)$
- True False Error c) $!(x = y)$ should be $!(x == y)$ True False Error g) $y \Rightarrow x$ should be $y \geq x$
- True False Error d) $(x != 3) \ || \ (y == 2)$ True False Error h) $(y < 0) \ || \ (y > 6)$

3. If x is 8 and y is 2, then what are the values of the following? Show all of the steps.

/4

a) $x > 3 \ || \ y != 9$
 $= 8 > 3 \ || \ 2 != 9$
 $= T \ || \ T$
 $= T$

b) $x < y \ \&\& \ !(x == 1)$
 $= 8 < 2 \ \&\& \ !(8 == 1)$
 $= F \ \&\& \ !F$
 $= F \ \&\& \ T$
 $= F$

4. The following questions are based on this class.

/10

```
public class ifs
{
    public static void main (String args[])
    {
        new ifs ();
    }
    public ifs ()
    {
        int num = IO.inputInt ("Number? ");
        if (num == 1)
            System.out.print ("Boone");
        else if (num > 30)
            System.out.print ("Carver ");
        else if (num == 14)
            System.out.print ("Dean ");
        if (num < 3)
            System.out.print ("Morgan ");
        else
            System.out.print ("Walker ");
    }
}
```

variable type
variable name
2 ifs possible answers

Identify the following in the code:

(a)	What is the class name?	ifs
(b)	Identify a Boolean expression.	num == 1
(c)	What type of variable is declared?	int
(d)	What is the variable name?	num
(e)	What should the file be saved as?	ifs.java

What is printed for each of the following inputs?

num is 1	Boone	Morgan
num is 30		walker
num is 31	Carver	walker
num is 14	Dean	walker
num is -2		Morgan

Communication

5. Fill in the blanks in the Madlibs story's constructor after looking at the output below.

/8

Input/Output

Enter a number: 99
 Enter another number: 1
 Enter yet another number: 12
 Enter an adjective: smelly
 Enter a place: fire department

House for Sale! Very smelly!!!

This smelly house has 99 bedroom(s) and 1 bathroom(s). It is conveniently located near the local fire department which buyers will find very smelly. Cost = \$12

```
public House () {
    int num1 = IO.input Int ("Enter a number: ");
    int num2 = IO.inputInt ("Enter another number: ");
    int num3 = IO.inputInt ("Enter yet another number: ");
    String adj = IO.inputString ("Enter an adjective : ");
    String place = IO.inputString ("Enter a place: ");
    System.out.println ("\nHouse for Sale! Very " + adj + "!!!\n");
    System.out.println ("This " + adj + " house has " + num1 + " bedroom(s) and ");
    System.out.println (num2 + " bathroom(s). It is conveniently located ");
    System.out.println ("near the local " + place + " which buyers ");
    System.out.println ("will find very " + adj + ". Cost = $" + num3);
}
```

6. Why are each of the following variable names inappropriate?

/4

- GarretMorgan! no special characters are allowed
- int this is a keyword, it already has a purpose
- traffic light spaces are not allowed
- 4safety numbers cannot be first (other places is OK)

7. Provide the term for each definition.

/8

declaration	The creation of a new variable. Eg. <code>int x = 0;</code>
main	The name of the method that starts the program.
constructor	The name of the method where you place your code.
math.PI	The way to write π in java. <i>also \sqrt{x} is <code>Math.sqrt(x)</code></i>
math.pow(x,2)	The way to write x^2 in java.
public	The first keyword that appears in a java program.
if	A control structure that is a decision statement in java.
Boolean	An expression that evaluates to true or false.

8. What is similar between Unicode and ASCII? What is different?
(two questions, one sentence for each)

/2

Similar: Both ASCII and Unicode are methods of encoding written letters into binary. so computers can store them.

Difference: ASCII is shorter and takes up less space. Because it is shorter, it can only store English. Unicode is longer so it is able to encode all the world's languages.

Thinking

9. Assume all numbers are integers. What are the answers to the following questions?

/4

$10/5 = 2$	$7/0 = \text{undefined}$	$10/24 = 0$	$203/1 = 203$
$10\%5 = 0$	$7\%0 = \text{undefined}$	$10\%24 = 10$	$203\%1 = 0$

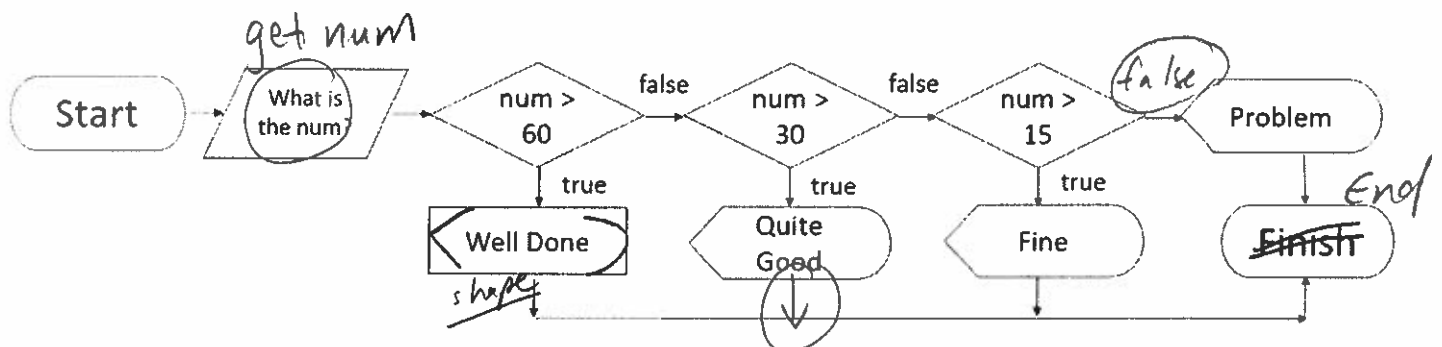
10. Classify each piece of input with the most appropriate type.

/6

(a) Johnson	String	(c) 45.3	double	(e) (905) 453-9220	String
(b) -111	int	(d) y	char	(f) L4V 5E6	String

11. Circle and correct 5 errors in this flowchart.

/5

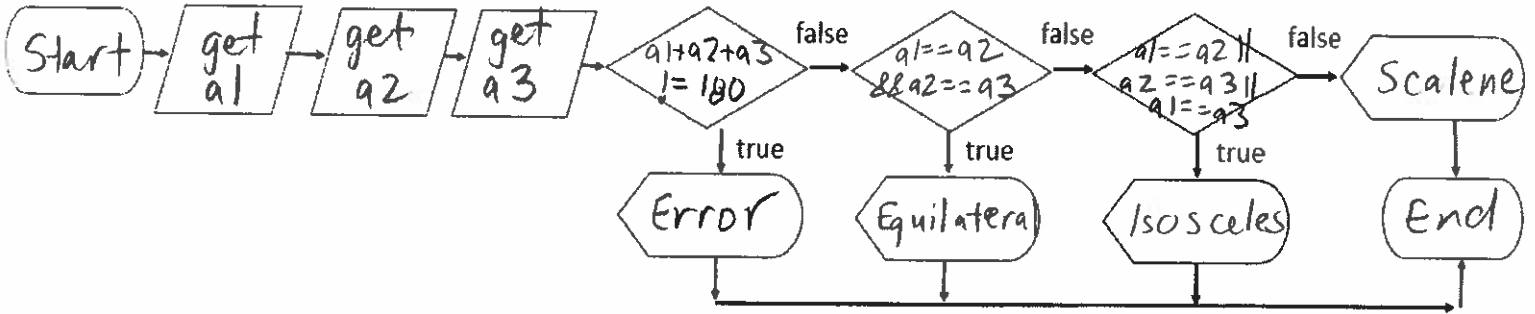


12. Use the code to fill in the blanks on the flow chart below.

/6

The Code:

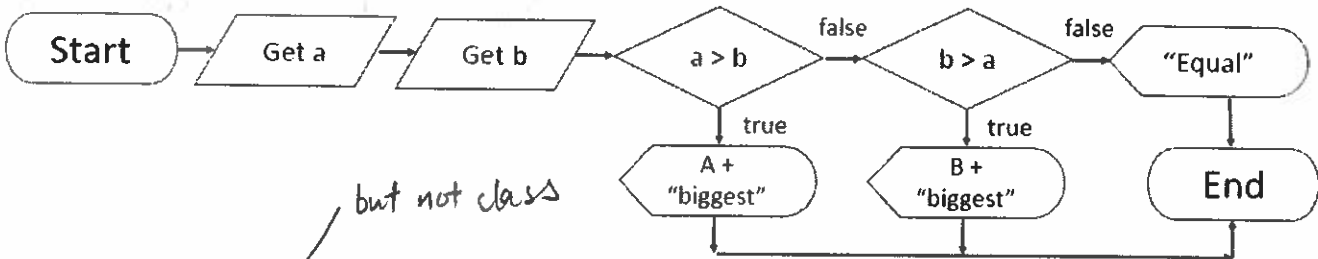
```
int a1 = IO.inputInt ("Angle #1? ");
int a2 = IO.inputInt ("Angle #2? ");
int a3 = IO.inputInt ("Angle #3? ");
if ((a1 + a2 + a3) != 180)
    System.out.println ("Error");
else if (a1 == a2 && a2 == a3)
    System.out.println ("Equilateral");
else if (a1 == a2 || a2 == a3 || a1 == a3)
    System.out.println ("Isosceles");
else
    System.out.println ("Scalene");
```



Application

13. Write code that would result from this flowchart. (a and b are integers)

/6



but not class

```
public Whatever () {
    int a = IO.inputInt ("Enter a number:");
    int b = IO.inputInt ("Enter another number:");
    if (a > b)
        System.out.println (a + " biggest");
    else if (b > a)
        System.out.println (b + " biggest");
    else
        System.out.println ("Equal");
}
```

14. For this program: **Don't include the public class stuff.**

Sample runs of the program are shown. The user input is underlined.

Dorothy Vaughn is running in a by-election against Mary Jackson.
Make a program that asks how many votes each candidate received.
Calculate the percentage of votes for Vaughn and for Jackson.
Also, print out who won the election: **don't forget that they might tie.**

/15

Hint: Remember $\backslash t$ and $\backslash n$. Format exactly as shown.

```
Enter the number of votes for Vaughn: 1276
Enter the number of votes for Jackson: 952
Space
Total Votes: 2228
Vaughn: 57.27%
Jackson: 42.73%
Space
Vaughn won.
```



```
int vvotes = io.inputInt("Enter the number of votes for Vaughn:");
int jvotes = io.inputInt("Enter the number of votes for Jackson:");
```

```
int total = vvotes + jvotes;
double vper = vvotes * 100 / total;
double jper = jvotes * 100 / total;
```

```
System.out.println("");
System.out.println("Total Votes: " + total);
System.out.println("Vaughn: " + vper + "%");
System.out.println("Jackson: " + jper + "%");
System.out.println("");
```

```
if (vvotes > jvotes)
    System.out.println("Vaughn won.");
else if (jvotes > vvotes)
    System.out.println("Jackson won.");
else
    System.out.println("Tie");
```

Note:
this code is really similar to #13.
There is often code to help you on the test.