**Name**

**Advanced Programming in Java**

**Lab Exercise 9/11/2024**

Reference: Lesson 10 in Blue Pelican Java

1. What are the two permissible data types to use for *x* in the following?

switch (x){ . . . }

2. What is the output of the following code?

int x = 3, p = 5, y = -8;

switch(x)

{

case 2:

p++;

case 3:

case 4:

y+=(--p);

break;

case 5:

y+=(p++);

}

System.out.println(y);

3. Write a *switch* structure that uses the character *myChar*. It should increment the integer

variable *y* if *myChar* is either a capital or small letter G. It should decrement *y* if *myChar*

is either a capital or a small letter M. If *myChar* is anything else, add 100 to *y*.

4. What is output by the following code?

int z = 2, q = 0;

switch(z)

{

case 1:

q++;

case 2:

q++;

case 3:

q++;

case 4:

q++;

default:

q++;

}

System.out.println(--q);

5. Write a line of code that declares the variable *chr* as a character type and assigns the

letter *z* to it.

6. What is output by the following?

int x = 10, y = 12;

System.out.println( “The sum is ” + x + y );

System.out.println( “The sum is ” + (x + y) );

7. Convert the following code into a *switch* statement.

if(speed = = 75)

{

System.out.println(“Exceeding speed limit”);

}

else if( (speed = = 69) || (speed = = 70) )

{

System.out.println(“Getting close”);

}

else if(speed = = 65)

{

System.out.println(“Cruising”);

}

else

{

System.out.println(“Very slow”);

}

8. Is *default* a mandatory part of a *switch* structure?

9. Write a line of code that converts *String s = “X”* into a character called *chr*.

**Programming Exercise**

1. Write a program that will determine the user’s weight on another planet. The program should ask the user to enter his weight (on earth) via the keyboard and then present a menu of the other mythical planets. The user should choose one of the planets from the menu, and use a *switch* (with an integer) statement to calculate the weight on the chosen planet. Use the following conversion factors to determine the user’s weight on the chosen planet.

**Planet Multiply weight by:**

Voltar 0.091

Krypton 0.720

Fertos 0.865

Servontos 4.612

A typical output screen will be similar to the following:

What is you weight on the earth? 135

1. Voltar

2. Krypton

3. Fertos

4. Servontos

Selection? 1

Your weight on Voltor would be 12.28499984741211

1. **Trigonometric functions.** Last week we used the Java Math package to calculate Write two programs Sine.java and Cosine.java that compute

*sin (x)* and *cos (x)* using the Taylor series expansions.

*sin x = x - x3/3! + x5/5! - x7/7! + . . .   
cos x = 1 - x2/2! + x4/4! - x6/6! + . . .*

Note1: x is angle in radians

Note2: Terms use alternating signs (0th term is positive, 1st term is negative, 2nd positive, etc. See if you can come up with a clever way to handle this situation as opposed to brute force programming.

When you have completed your programs, submit in your documented source code as well as a copy of this document with answers.