Advanced Placement Computer Science   Unit 4 Exam Review

Part I: Multiple Choice (10 questions / 4 points each)

   1) Nested for loops
   2) while loop
   3) How would you write a loop to accumulate all the numbers between x & y?
   4) for loop / .substring / .equals
   5) recursive method
   6) sentinel controlled loop
   7) recursive method
   8) Nested while loops / modulus(%)
   9) Given a 3-digit number xyz, write a loop that will reverse the digits zyx.
  10) Nested for loops

Sample Questions:

1) Consider this code segment:

```
int x = 8;
int y = 0;

while (x > 5)
{
     y = 2;
     while (y < x)
     {
          y *= 2;
          if (x % y == 2)
               break;
     }
     x -= 1;
}
System.out.println(x + " " + y);
```

   What will be the output after execution of this code segment?

   a) 4 4   b) 5 4   c) 5 8   d) 6 4   e) 6 8

2) Consider the following recursive method.

```
public static int mystery(int n)
{
     if (n == 0)
          return 3;
     else
          return mystery(n-1) * n;
}
```

   What value is returned by the call int x = mystery(3)?

   a) 1   b) 3   c) 6   d) 18   e) 72

Part II: Free Response (4 questions / 10 points each)

1) Create code that will produce the following output:

```
2-----
-4----
--6---
---8—-
```

You must use nested loops and your print statements can output, at most, a single number or a single character.

2) The population of Mexico in 1990 was 89.2 million. Write code that prints the year (starting with 1991) and the expected population that year, assuming a constant growth rate of 2.3% per year. The last year printed, should be the first year Mexico's population exceeds 120 million.

3) Complete the method myGPA. This method has one String argument that contains the letter grades for one of Mr. Ehren's Geometry classes. Using the scale below, this method should determine and return the GPA of these letter grades.

A = 4, B = 3, C = 2, D = 1, F = 0

You may assume the String variable grades might look something like this:

grades = "FBCDABAAABBAAABAAACA"

Remember, each time myGPA is called, the String variable grades will probably have a different length.

4) Complete the method myFactors. This method should determine and print to the console window, all factors of each integer from 30 to 50. The output should look like this:

```
Number   Factors
------   -------
30       1, 2, 3, 5, 6, 10, 15, 30
31       1, 31
32       1, 2, 4, 8, 16, 32
.
.
.
50       1, 2, 5, 10, 25, 50
```

<u>Java Concepts</u> Review Assignment:

Pages 276 – 277   Exercises: R6.2 – R6.6
Page 618   Exercises: R13.6, R13.8, R13.9