COMP 248 - Tutorial #6

More control structures, Type Casting & Arrays

Question 1: What is the output of:

A)

```
int x = 0;
while (x != 8);
{
  System.out.print("Hello");
  x = x + 1;
}
```

B)

```
int x=0;
while (x != 8);
{
  System.out,print("Hello");
}
```

C)

```
for (int j = 0; j <= 2; j++) //outer loop
{
      System.out.print(j);
       for (char ch = 'A'; ch <= 'M'; ch+= (3+j)) //inner loop
             System.out.print((char)(ch + 1));
       System.out.println();
}
```

D)

```
for (int i = 1;i < 9;i++)
{
       if (i%2 == 0) System.out.println( i + 1);
       else if (i%3 == 0) continue;
       else if (i%5 == 0) break;
       else System.out.println( "Not multiple of 2, 3 or 5.");
 }
System.out.println ("End");
```

Question 2: Write a program to draw the following shapes using loops:

A)

```
*
**
***
****
*****
```

B)

```
    *
   ***
  *****
   ***
    *
```

Question 3: Write a program to ask the user for an integer then displays an "hour glass figure" as illustrated in the samples below.

Notes:

- Your code should work for odd and even numbers.
- Your code should check that the user enters an integer >=2. If it is not the case, the program should display an error message.

The following are three sample outputs to illustrate how your program should behave.

`Enter an integer: 5`
`*****`
` ***`
`  *`
` ***`
`*****`
	`Enter an integer: 6`
	`******`
	` ****`
	`  **`
	` ****`
	`******`
		`Enter an integer: 1`
		`Error.`

Question 4: Assume the following program:

```
public class Increment
{
    public static void main(String[] args)
    {
        int prevprev = 2;
        int prev = 2;
        int sum = 0;
        for (int i = 1; i < 4; i++)
        {
            sum = prevprev + prev;
            System.out.println(prevprev + " " + prev + " " + sum);
            prevprev = prev;
            prev = sum;
        }
    }
}
```

A- What is the output of this program?

B- If we replace the **`for`** with the following lines, will the output be the same? If the output will be different, what will it be?

```
for (int i = 1; ++i < 4; )
```

```
for (int i = 1; i < 4; ++i)
```

Question 5: Write a Java program to find and display the smallest positive integer whose remainder:

- when divided by 3 is 1,
- when divided by 5 is 2, and
- when divided by 7 is 3.

Question 6: Write a nested `for` loop to display the following output:

```
a b c d e
b c d e
c d e
d e
e
```

Question 7: Given the following declarations, what is result is stored in each of the listed assignment statements?

```
int iResult, num1 = 25, num2 = 40, num3 = 17, num4 = 5;
double fResult, val1 = 17.0, val2 = 12.78;
```

A. `fResult = (double) num1 / num2;`
B. `fResult = num1 / (double) num2;`
C. `fResult = (double) (num1 / num2);`
D. `iResult = (int) (val1 / num4);`
E. `fResult = (int) (val1 / num4);`
F. `fResult = (int) ((double)num1 / num2);`

Question 8: What will be displayed by the following?

A)

```
int i;
int a[] = {5, 2, 3, 1, 1, 0, 2, 1, 0, 1};
for (i = 0; (i < 10); i++)
{
      if (a[i] == 0)
         break;
      if (i % 3 == 0)
         continue;
      System.out.print(a[i]);
}
```

B)

```
class Parray {
   public static void main(String[] args)
   {
       int[] data = {1,3,5,8,11,15};
       int sum = 0;
       for(int i = 1; i < data.length; ++i) {
          sum = sum + data[i] - data[i-1];
          System.out.println("sum  = " + sum);
       }
   }
}
```

C)

```
class Parray
{
  public static void main(String[] args)
  {
    int[] data = {1, 2, 3, 4, 5, 6, 7};
    boolean[] filter = {true, false, true, true, false, true, true};

    int sum = 0;
    for (int i = 0; i < data.length; ++i)
      if (filter[i])
         sum = sum + data[i];

    System.out.println("data:" + sum);

    for(int i = 0; i < filter.length; ++i)
       filter[i] =  !filter[i];

    sum =0;
    for (int i = 0; i < data.length; ++i)
      if (filter[i])
         sum = sum + data[i];

    System.out.println("data:" + sum);
  }
}
```