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WIX1002 Fundamentals of Programming
Tutorial 4 Flow of Control (Repetition)

1. Write statements for each of the following
    a. Find the largest integer n so that n^3 is less than 2000.

```
int n = 0;
int max = 0;

while((n*n*n) < 2000){
   if(n>max)
   {
      max=n;
   }
   n++;
}

System.out.println("The largest integer n is: " + max);
```

    b. Display the square number of the first twelve integers starting from 1.

```
for (int i = 1; i <= 12; i++) {
   int square = i * i;
   if(i == 12){
      System.out.println(square);
   } else{
      System.out.print(square + ", ");
   }
}
```

    c. Display a 4-by-5 matrix using random number within 0 to 100.

```
Random random = new Random();

for (int i = 0; i < 4; i++) {
   for (int j = 0; j < 5; j++) {
      System.out.printf("%3d", random.nextInt(101));
   }
   System.out.println();
}
```

d. Compute the sum of numbers from 1 to a given number.

```
Scanner scanner = new Scanner(System.in);

    System.out.print("Enter a number: ");
    int number = scanner.nextInt();

    int i = 1;
    int sum = 0;
    while(i <= number){
       sum += i;
       i++;
    }
    System.out.println("The sum of numbers from 1 to " + number + " is: " + sum);

    scanner.close();
```

e. Compute the sum of the series: 1/25+2/24+3/23 … + 25/1 in two decimal places.

```
    double sum = 0;
    double j = 25;

    for (int i = 1; i <= 25; i++, j--) {
       sum += i / j;
    }
       System.out.printf("The sum of the series: %.2f\n", sum);
```

2. Correct the error for the following statements.

a.

```
for (x = 10; x > 0; x++)
   sum += x;
```

```
int sum = 0;
for (int x = 10; x>0; x--)
sum += x;
```

b.

```
do
   x += 2;
   y += x;
   System.out.println(x + " and " + y);
while (x < 100)
```

```
int x = 0;
int y = 0;
do {
      x += 2;
      y += x;
      System.out.println(x + " and " + y);
   } while (x < 100);
```

c.

```
for ( x==1, y==20; x < y, x++, y-=2);
   System.out.println(x & " " & y);
```

```
for (int x = 1, y = 20; x < y; x++, y-=2) {
         System.out.println(x + " " + y);
      }
```

d.

```
i =1;
while(i<10) {
   if (i==10)
      System.out.println("Program End");
}
```

```
int i = 1;
while(i<10) {
   i++;
   if (i==10)
   System.out.println("Program End");
}
```

3. Write the statements that display the first ten values of the Fibonacci sequence. Given the formula $f_1 = 1$, $f_2 = 1$, $f_n = f_{n-1} + f_{n-2}$.

```
public class T4Q3 {
   public static void main(String[] args) {
      int f1 = 1;
      int f2 = 1;
      int fn; // let fn as the next number

      for (int i = 1; i <= 10; i++) {
         if (i == 10){
            System.out.println(f1);
         }else{
            System.out.print(f1 + ", ");
            fn = f1 + f2;
            f1 = f2;
            f2 = fn;
         }
      }

   }
}
```

4. Write the statements that display the string in reverse order. (use String.length() to get the length of the string)

```
import java.util.Scanner;
public class T4Q4 {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);

      char currentChar;
      String reversed = "";
      System.out.print("Enter a sentence: ");
      String sentence = scanner.nextLine();

      for (int i = sentence.length() - 1; i >= 0; i--){ // array from 0 to 3
         currentChar = sentence.charAt(i);
         reversed += currentChar;
      }
      System.out.println(reversed);

      scanner.close();
   }
}
```