Exercise – nested loops

1. trace the following

```
for (int x=1; x <= 3; x++){
        System.out.println(x);
        for (int y=101; y <=105; y++){
                System.out.println(y);
        }
}
```

OUTPUT	MEMORY x	MEMORY y
1 101 102 103 104 105 2101 102 103 104 105 3 101 102 103 104 105	x=1,2,3	y=101,102,103,104,105

2. trace the following

```
int x=0;
int y;

do {
        y = 10;
        x=x+1;
        while (y!=13) {
                y = y+1;
                System.out.println( y  );
        }
        System.out.println(x);
}while (x<=3);
```

OUTPUT	MEMORY x	MEMORY y

11 12 13 1 11 12 13 2 11 12 13 3 11 12 13 4 11 12 13	x=0,1	y=10,11,12,13

3. Write a program that….
a) Asks a user to enter 4 marks (each out of a 100) for a student
b) Calculate and print the average of the student's marks.
c) repeat steps a and b for another student until the user is finished
save as *nested3.java*

```
Scanner input = new Scanner(System.in);
String entry;
do {
System.out.println("Enter first mark:");
double mark1 = input.nextDouble();
System.out.println("Enter second mark:");
double mark2 = input.nextDouble();
System.out.println("Enter third mark:");
double mark3 = input.nextDouble();
System.out.println("Enter fourth mark:");
double mark4 = input.nextDouble();
double average = (mark1+mark2+mark3+mark4)/4;
if ((average<=100) && (average>=0)) {
System.out.println("The average of this student is " + average);
}
System.out.println("Would you like to input makrs for another students?");
entry = input.next();
}
while (!entry.equals("finished"));
```

4. Nested loop

Write a program that prints out the times table up to 6 times 6:

```
1 times table - 1	2	3	4	5	6
2 times table - 2	4	6	8	10	12
3 times table - 3	6	9	12	15	18
4 times table - 4	8	12	16	20	24
5 times table - 5	10	15	20	25	30
6 times table - 6	12	18	24	30	36
```

```
int x=1;
for (; x<=6;x++ ) {
System.out.print(x+ " times table ");
for (int y=1; y<=6; y++) {
     int operation = x*y;
     System.out.print("\t" + operation);
     }
System.out.println();
}
```

5. Write a program that asks for a length and width of a rectangle (less than the screen width and less than the screen length. Draw a rectangle made of asterisks of the dimensions entered.

What is the width? 5

What is the length? 4

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

```
Scanner input = new Scanner (System.in);
System.out.println("What is the width?");
int width = input.nextInt();
System.out.println("What is the length?");
int length = input.nextInt();
for(int trackw=1; trackw<=width; trackw++) {
    for (int trackl=1; trackl<=length; trackl++) {
    System.out.print("*");
    }
System.out.println();
}
```

6. Write a program using nested loops to produce the following output:

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

```
Scanner input = new Scanner (System.in);
System.out.println("What is the base?");
int base = input.nextInt();
System.out.println("What is the length?");
int length = input.nextInt();
for (int trackl=1; trackl<=length; trackl++) {
     for (int trackb=1; trackb<=trackl; trackb++) {
```

```
        System.out.print("*");
        }
System.out.println();
}
```

7. substring() - Write a program that duplicates the following input and input:

```
Enter a string: Canada
Canada
Canad
Cana
Can
Ca
C
```

```
String input = "Canada";
int length = input.length();
for (int row=1; row<=length; row++) {
     for (int column=0; column<row; column++) {
     System.out.print(input.charAt(column));
     }
System.out.println();
}
```

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