**Nested Loops are not included in your midterm exam. So you can skip nested loop problems.**

1. Write the code and draw the flowchart of a program that prints the following sequences of values in loops:

a) 24, 18, 12, 6, 0

b) -10, -5, 0, 5, 10, 15

c) 18, 27, 36, 45, 54

d) 2, -4, 6, -8, 10, -12

2. Write the code and draw the flowchart of a program that calculates and prints the sum of the even integers from 10 to 60.

3. Write the code and draw the flowchart of a program that calculates and prints the product of the odd integers from 3 to 13.

4. Write the code and draw the flowchart of a program that will calculate the value of y if the expression of y is as follows (n is the input):

5. Write the code and draw the flowchart of a program that reads the value of *n* and calculates the value of y3 if the expression of y3 is as follows (n is the input):

6. Write the code of a program that reads marks of ten courses and prints the maximum, minimum and average of those ten marks.

7. Draw the flowchart and write the code for the following:

* Ask the user to enter a Number
* Display the summation of multiples of 7 up to that number.

Example: If the user enters 50, your program should print 196. (because: 7 + 14 + 21 + 28 + 35 + 42 + 49 = 196).

8. Draw the flowchart and write the code for the following:

1) Ask the user to enter his/her name.

2) Ask the user to enter a Number

3) Display the name of the user, number of times specified in the second step.

Example: If the user enters “John” and 6, your program should print the name John six times.

9. Write a Java program which adds all numbers that are multiples of both 7 and 9 up to 600.

10. Write a Java program which adds all numbers that are multiples of either 7 or 9 up to 600.

11. Write a Java program which adds all numbers that are multiples of either 7 or 9 but not both, up to 600.

**Tracing**

| **1** | **public class Q3{** |
| --- | --- |
| **2** | **public static void main(String[] args){** |
| **3** | **int x = 0, y =0;** |
| **4** | **int sum = 0;** |
| **5** | **while (x < 10){** |
| **6** | **y = x - 3;** |
| **7** | **while (y < 3){** |
| **8** | **sum = (sum % 2) + x - y \* 2 ;** |
| **9** | **System.out.println(sum);** |
| **10** | **y = y + 1;** |
| **11** | **}** |
| **12** | **if (x > 5){** |
| **13** | **x++;** |
| **14** | **}else{** |
| **15** | **x += 2;** |
| **16** | **}** |
| **17** | **}** |
| **18** | **}** |
| **19** | **}** |

| **1** | **public class Q4{** |
| --- | --- |
| **2** | **public static void main(String[] args){** |
| **3** | **int x = 0, i =0, sum = 0;** |
| **4** | **i = 1;** |
| **5** | **x = 2;** |
| **6** | **sum = 0;** |
| **7** | **while (i< 20){** |
| **8** | **x = x + i;** |
| **9** | **sum = sum + x + 1;** |
| **10** | **System.out.println(sum);** |
| **11** | **if (x > 5){** |
| **12** | **i += 2;** |
|  | **}** |
| **13** | **else{** |
| **14** | **i += 3;** |
|  | **}** |
| **15** | **}** |
| **16** | **sum = sum + i;** |
| **17** | **System.out.println(sum);** |
| **18** | **}** |
| **19** | **}** |

| **1** | **public class Q7{** |
| --- | --- |
| **2** | **public static void main(String[] args){** |
| **3** | **int test = 1;** |
| **4** | **int j = 0, k = 100;** |
| **5** | **while (k > 0){** |
| **6** | **while (j < k ){** |
| **7** | **test = k - j + 21;** |
| **8** | **System.out.println(1 + test);** |
| **9** | **j += 10;** |
| **10** | **}** |
| **11** | **k -= 10;** |
| **12** | **}** |
| **13** | **}** |
| **14** | **}** |

| **1** | **public class Q10 {** |
| --- | --- |
| **2** | **public static void main(String[] args) {** |
| **3** | **int x = 0, y = 0;** |
| **4** | **String sum = "0";** |
| **5** | **double p;** |
| **6** | **while (x < 9) {** |
| **7** | **y = x / 2;** |
| **8** | **while (y < x) {** |
| **9** | **p = (x + 5.0) / 2;** |
| **10** | **sum = (sum + 2) + x + "y \* 2" + (int) p ;** |
| **11** | **System.out.println(sum);** |
| **12** | **y = y + 1;** |
| **13** | **}** |
| **14** | **x = x + 2;** |
| **15** | **if (x > 5) {** |
| **16** | **sum = "2";** |
| **17** | **} else {** |
| **18** | **sum += "3";** |
| **19** | **}** |
| **20** | **}** |
| **21** | **}** |
| **22** | **}** |

| **1** | **public class Q12 {** |
| --- | --- |
| **2** | **public static void main(String[] args) {** |
| **3** | **int p = 5;** |
| **4** | **int q = 6;** |
| **5** | **int r = 9;** |
| **6** | **int sum = 0;** |
| **7** | **if (p < 12) {** |
| **8** | **System.out.println(r + 2);** |
| **9** | **} else {** |
| **10** | **System.out.println(r + p);** |
| **11** | **}** |
| **12** |  |
| **13** | **if (q > 20){** |
| **14** | **System.out.println(r + 19);** |
| **15** | **} else if (q <= 6) {** |
| **16** | **System.out.println(q + 3);** |
| **17** | **} else{** |
| **18** | **System.out.println(p + q + r);** |
| **19** | **}** |
| **20** |  |
| **21** | **if (r > 15) {** |
| **22** | **System.out.println(r);** |
| **23** | **} else if (r == 0) {** |
| **24** | **System.out.println(p + q);** |
| **25** | **} else {** |
| **26** | **System.out.println(p);** |
| **27** | **}** |
| **28** |  |
| **29** | **if (sum != 0) {** |
| **30** | **System.out.println(3);** |
| **31** | **} else {** |
| **32** | **System.out.println(sum + 32);** |
| **33** | **}** |
| **34** |  |
| **35** | **if(p > 0 && r < 10){** |
| **36** | **System.out.println(p + r);** |
| **37** | **} else {** |
| **38** | **System.out.println(p - r);** |
| **39** | **}** |
| **40** | **}** |
| **41** | **}** |

| **public class Q39 {** |
| --- |
| **public static void main(String[] args) {** |
| **int test = 1;** |
| **int j = 0, k = 100;** |
| **while (k > 0) {** |
| **while (j < k ) {** |
| **test = k - j + 21;** |
| **System.out.println(1 + test / 2 +"11");** |
| **j+=10;** |
| **}** |
| **k-=10;** |
| **}** |
| **}** |
| **}** |

| public class Q41 { |
| --- |
| public static void main(String[] args) { |
| boolean var1=false, var2=false, var3=false, var4=false,var5=false; |
| boolean var6=false, result1=false, result2=false, result3=false, result4=false; |
| boolean result5=false, result6=false, result7=false, result8=false; |
| boolean result9=false, result10=false; |
| var1=(!false || false) && true; |
| var2=var1 && true; |
| var3=false && !true; |
| var4=true; |
| var5=false; |
| var6=var3 && true; |
| result1=(var1 && var2) && ( 40 % 3 > 45) || (var5 && var6); |
| result2=(var1 || var2) || (result1 && false); |
| result3=(var1 && result1) || result2 || var5; |
| result4=(var1 || var2) || ((var3 && var1) && false); |
| result5=(var1 && var2) && (result3 || var1); |
| result6=((var3 || !var2) && (result5)) || true; |
| result7=(var4 && result1) && ((result1 && false) || true); |
| result8=((var1 && result3) && (!var5 || var6)) && true; |
| result9=((result2 && var2) || (!result7 && var1)) && !false; |
| result10=!(var1 && true); |
| } |
| } |

Show the values of the result variables in the above program:

| result1 |  |
| --- | --- |
| result2 |  |
| result3 |  |
| result4 |  |
| result5 |  |
| result6 |  |
| result7 |  |
| result8 |  |
| result9 |  |
| result10 |  |

| **public class Q45 {** |
| --- |
| **public static void main(String[] args) {** |
| **int x = 0, y =0;** |
| **int sum = 0;** |
| **double p;** |
| **while (x < 10) {** |
| **y = x / 2;** |
| **while (y < x) {** |
| **p = (x + 5.0) / 2;** |
| **sum = (sum % 2) + x - y \* 2 + (int) p ;** |
| **System.out.println(sum);** |
| **y = y + 2;** |
| **}** |
| **if (x > 5) {** |
| **x++;** |
| **} else {** |
| **x += 2;** |
| **}** |
| **}** |
| **}** |
| **}** |

| **1** | **public class T3** |
| --- | --- |
| **2** | **{** |
| **3** | **public static void main(String args[])** |
| **4** | **{** |
| **5** | **int x = 0, y = 0;** |
| **6** | **int sum = 0;** |
| **7** | **while (x < 10){** |
| **8** | **y = x - 3;** |
| **9** | **y = 40;** |
| **10** | **while (y > 22){** |
| **11** | **if ((sum > 30) && (sum < 40)){** |
| **12** | **sum = sum + x \* 2 ;** |
| **13** | **}** |
| **14** | **else if ((sum > 40) && (sum < 50)){** |
| **15** | **sum = sum + x \* 3;** |
| **16** | **}** |
| **17** | **else {** |
| **18** | **sum = sum + 23;** |
| **19** | **}** |
| **20** | **System.out.println(sum);** |
| **21** | **y = y - 10;** |
| **22** | **}** |
| **23** | **x += 2;** |
| **24** | **}** |
| **25** | **}** |
| **26** | **}** |

**Modulus Operator:**

**8 % 3** evaluates to **2** because **8** divided by **3** has a remainder of **2**.

When both operands have type **int**, the modulus operator (with both operands) evaluates to **int**.

Normally, most programmers use the mod operator when both operands are positive. After all, what does remainder mean when one or both operands are negative?

Even so, Java allows for one or both operands to be negative. What is the result? First, do the mod operation as if both numbers are positive, e.g., if you are evaluating **x % y**, then you should evaluate **|x| % |y|** (where **|x|** is the absolute value of **x**. **Then, if the left operand is negative, make the result negative.**

Thus, **-8 % 3** is **-2** (left operand is negative) while **8 % -3** is **2** (left operand is positive). Using this rule, the evaluated result is negative if both operands are negative. **-8%-3 = -2**