

# 1 Conditionals

1. What is the value of **result** when the following code is executed?

```
1      float result = 1.5;
2      int a = 12, b = 5;
3      if(b > a) {
4          result += 0.3;
5      }
6      else {
7          result -= 0.3;
8      }
```

**Solution:** 1.2

2. What is the value of **result** when the following code is executed?

```
1      float result = 1.5;
2      int a = 12, b = 5;
3      if(a % b == a / b) {
4          result += 0.3;
5      }
6      else {
7          result -= 0.3;
8      }
```

**Solution:** 1.8

3. What is the value of **result** when the following code is executed, if,

1. a = 7, b = 12
2. a = 15, b = 12
3. a = 12, b = 12

```
1      int result = 4;
2      if(b > a) {
3          result = 1;
4      }
5      else if(b < a) {
6          result = -1;
7      }
8      else {
9          result = 0;
10     }
```

**Solution:**

4. `a = 7, b = 12 -> result = 1`
5. `a = 15, b = 12 -> result = -1`
6. `a = 12, b = 12 -> result = 0`

7. For what range of **marks**, will the value of **result** when the following code is executed, be 2?

```
1      int result = 0;
2      int marks = (int)random(101); //between 0 and 100
3      if(marks < 50)
4          result = 0;
5      else if(marks < 65)
6          result = 1;
7      else if(marks < 75)
8          result = 2;
9      else if(marks < 85)
10         result = 3;
11     else
12         result = 4;
```

**Solution:** 65 to 74

8. Assuming the existence of an integer variable **data** with some value stored in it, write a piece of code that assigns the absolute value of **data** into another integer variable **result**

**Solution:**

```
1      if(data >= 0)
2          result = data;
3      else
4          result = -data;
```

9. Assuming the existence of two integer variables **a**, **b** with some values stored in them, write a piece of code that assigns, to a third integer variable **result**,

1. 1 if both **a**, **b** are positive
2. -1 if both **a**, **b** are negative
3. 0 in all other cases

**Solution:**

```
1      int result = 0;
2      if(a > 0 && b > 0)
3          result = 1;
4      if(a < 0 && b < 0)
5          result = -1;
6      //in all other cases, result
7      //remains unchanged (0)
```

10. Assuming the existence of two integer variables **a**, **b** with some values stored in them, write a piece of code that assigns, to a third integer variable **result**,

1. 1 if both **a**, **b** are even
2. -1 if both **a**, **b** are odd
3. 0 in all other cases

**Solution:**

```
1      int result = 0;
2      if(a % 2 == 0 && b % 2 == 0)
3          result = 1;
4      if(a % 2 != 0 && b % 2 != 0)
5          result = -1;
6      //in all other cases, result
7      //remains unchanged (0)
```

11. Assuming the existence of an floating-point variable **data** with some value stored in it, write a piece of code that assigns, to a second integer variable **result**, the value of **data** rounded-off to the nearest integer. For example, if **data** = 4.6, **result** should be 5. If **data** = 4.4, **result** should be 4. if **data** = 4.5, **result** should be 5. if **data** = 4.0, **result** should be 4.

**Solution:**

```
1      if(data - (int)data < 0.5)
2          result = (int)data; //round down
3      else
4          result = (int)data + 1; //round up
```

another (more compact, but also more cryptic) way,

```
1      result = (int)(data + 0.5);
```

12. Assuming the existence of three integer variables **a**, **b**, **c** with some values stored in them, write a piece of code that assigns, to a fourth integer variable **result** according to the following table,

a	b	c	result
positive	positive	positive	0
positive	positive	non-positive	1
positive	non-positive	positive	2
positive	non-positive	non-positive	3
non-positive	positive	positive	4
non-positive	positive	non-positive	5
non-positive	non-positive	positive	6
non-positive	non-positive	non-positive	7

### Solution:

```

1  if(a > 0)
2      if(b > 0)
3          if(c > 0)
4              result = 0;
5          else //c <= 0
6              result = 1;
7      else //b <= 0
8          if(c > 0)
9              result = 2;
10         else //c <= 0
11             result = 3;
12  else //a <= 0
13      if(b > 0)
14          if(c > 0)
15              result = 4;
16          else //c <= 0
17              result = 5;
18      else //b <= 0
19          if(c > 0)
20              result = 6;
21          else //c <= 0
22              result = 7;

```

a second way, alas, with more expression checks -

```

1  if(a > 0 && b > 0 && c > 0)
2      result = 0;
3  if(a > 0 && b > 0 && c <= 0)
4      result = 1;
5  if(a > 0 && b <= 0 && c > 0)
6      result = 2;
7  if(a > 0 && b <= 0 && c <= 0)
8      result = 3;
9  if(a <= 0 && b > 0 && c > 0)
10     result = 4;
11  if(a <= 0 && b > 0 && c <= 0)
12     result = 5;
13  if(a <= 0 && b <= 0 && c > 0)
14     result = 6;
15  if(a <= 0 && b <= 0 && c <= 0)
16     result = 7;

```