

Exercises for 02-Control statements

if

Throughout the exercises we will print text “on the screen”. This is done in different ways depending on what language you’re programming in. We provide examples, in the attached code, of how to print.

1. We have the following code.

```
if (nrOfStudents>90) {  
    bookBigRoom();  
} else {  
    bookMediumRoom();  
}
```

- a) let’s pretend that the number of students, reflected in the variable nrOfStudents, are 123. What method is called?
- b) let’s pretend that the number of students are 90. What method is called?
- c) let’s pretend that the number of students are 89. What method is called?

2. We have the following code.

```
if (nrOfStudents>90) {  
    bookBigRoom();  
} else if (nrOfStudents>20) {  
    bookMediumRoom();  
} else {  
    bookSmallRoom();  
}
```

- a) let’s pretend that the number of students, reflected in the variable nrOfStudents, are 123. What method is called?
- b) let’s pretend that the number of students are 90. What method is called?
- c) let’s pretend that the number of students are 89. What method is called?
- d) let’s pretend that the number of students are 21. What method is called?
- e) let’s pretend that the number of students are 20. What method is called?
- f) let’s pretend that the number of students are 5. What method is called?

g) let's pretend that the number of students are 0. What method is called?

3. We have the following code.

```
if (nrOfStudents>90) {  
    bookBigRoom();  
} else if (nrOfStudents>20) {  
    bookMediumRoom();  
} else if (nrOfStudents>0) {  
    bookSmallRoom();  
}
```

a) let's pretend that the number of students are 5. What method is called?

b) let's pretend that the number of students are 0. What method is called?

4. Look at the source code of the file IF4.

a) What do you think will be printed out?

b) Compile the file and execute it to see what is actually printed.

c) Change the value of age to 100. What will happen? Do (b) again.

d) Change the value of age to 101. What will happen? Do (b) again.

5. Look at the source code of the file IF5.

a) What do you think will be printed out?

b) Compile the file and execute it to see what is actually printed.

c) Change the value of age to 80. What will happen? Do (b) again.

d) Change the value of age to 90. What will happen? Do (b) again.

e) Change the value of age to 100. What will happen? Do (b) again.

f) Change the value of age to 101. What will happen? Do (b) again.

6. Write code that

- declares a variable, length
- assigns the variable
- if the user supplies a value less than or equal to 0 print out a message
- if the user supplies a greater than 272 print out another message
- otherwise print a third message
- test your code by assigning different values to length and compile and execute

for

1.

The code below is similar to an exercise in the while section.

```
for (int i=0; i<3; i++) {  
    setColor(RED);  
}
```

How many loops will be executed?

2.

```
for (int i=0; i<1; i++) {  
    setColor(RED);  
}
```

How many loops will be executed?

3.

```
for (int i=0; i<0; i++) {  
    setColor(RED);  
}
```

How many loops will be executed?

4.

```
for (int i=3; i>0; i--) {  
    setColor(RED);  
}
```

How many loops will be executed?

5.

```
int counter=0;
```

```
while (counter<3) {  
    setColor(RED);  
    counter++;  
}
```

Rewrite the code above to a for-loop.

while

1.

Look at the code below.

```
while (true) {  
    setColor(RED);  
}
```

How long does it execute?

2.

Look at the code below.

```
while (false) {  
    setColor(RED);  
}
```

How many loops will be executed?

3.

Look at the code below.

```
int counter=0;  
while (counter<3) {  
    setColor(RED);  
    counter++;  
}
```

How many loops will be executed?

4.

Look at the code below.

```
int counter=0;  
while (counter<3) {  
    setColor(RED);  
}
```

How many loops will be executed?

5.

Let's assume that the method `getTemperature` is connected to a thermometer and that the method returns an integer value which gives us the temperature in Celsius.

The method `heatUp` is connected to a radiator which will heat up the room.

```
while (getTemperature() < 20) {  
    heatUp();  
}
```

We're using the methods to heat up a room.

Explain how the function works.

6.

Look at the code in the file `While6`.

- a. How many times are the text printed?
- b. Replace the code with a while loop that. You should have one print statement but equally many printout shall be made.