if Conditional Statements

In this lesson, an explanation of if statements and how to write them using an example is provided.

We'll cover the following

The `if` statement

The **if statement** is used when a statement or group of statements are to be executed if a condition is `true`. The condition will be checked, and if the condition is true, then the certain operation will be executed, and if the condition is false, then nothing will happen. The program will move to the next executable statement. Let's understand this with the below example:

Example

```
class conditional {
 public static void main(String[] args) {
  int x = 10;

  if (x > 4) {
   System.out.println("x is greater than 4");
  }
 }
}
```

Explanation

Line 5:

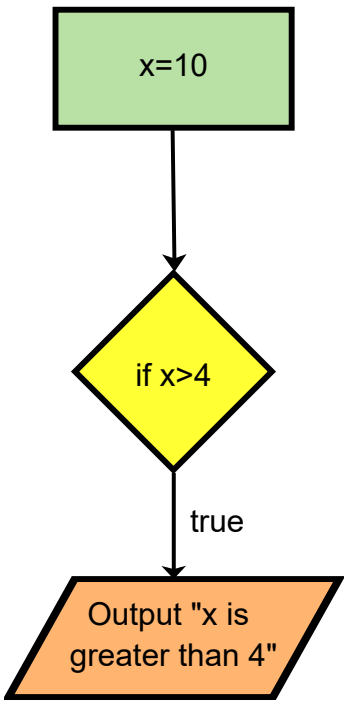
- Inside the parentheses is the **condition**; in this case, it is a *test* for **greater than**.
- It is a good practice to compare only the same types of data (for example, do not compare *floating-point* values to *characters*).
- Also, note the **left** *curly brace* `{` after the closing paratheses. This symbol denotes a block of *multiple* lines of code. Without it, the conditional would only refer to the statement immediately following it.
- It is a good practice to always use braces.

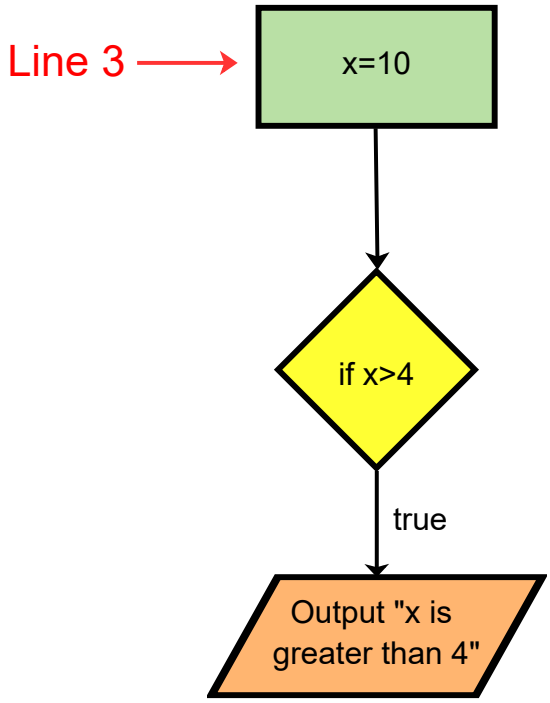
Line 6:

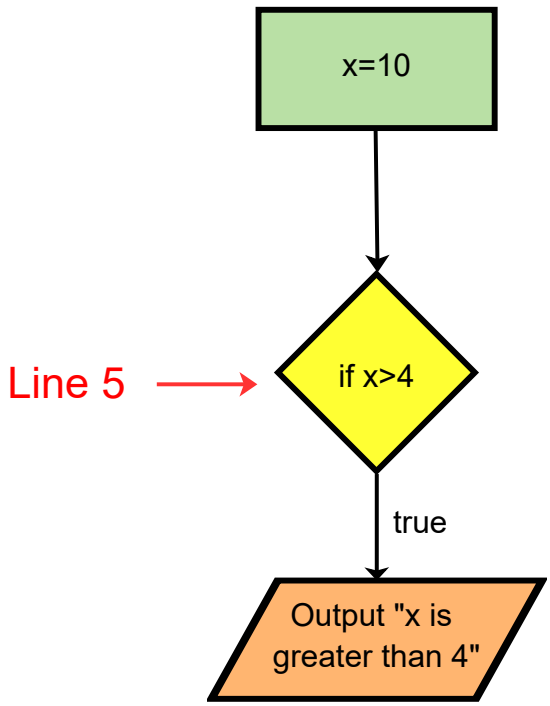
- This statement represents the *body* of the conditional statement.

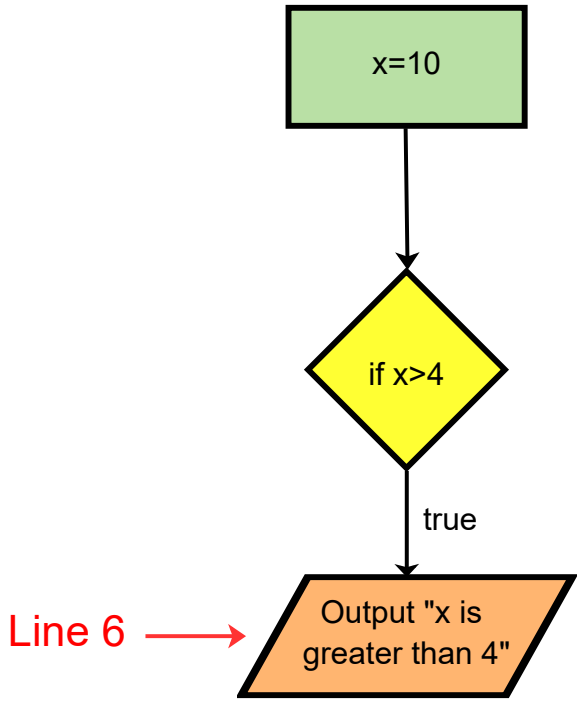
Line 7:

- The *right* curly brace is **essential**; it matches the *opening brace* on line **5** and signals the *end* of the `if` body.




Line 3
x=10
if x>4
true
Output "x is greater than 4"


x=10
Line 5
if x>4
true
Output "x is greater than 4"



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The `if-else` statement

The `if` clause executes statements only when a certain condition is true. If some commands also need to be executed when the condition is false, then the `if-else` clause comes into play. The `if` clause will be the same, and an `else` clause will be added to execute statements when the condition under `if` fails.

> **Note:** There can be multiple conditions for which `if` clause fails, so use commands under `else` carefully.

Let's understand this with the below example:

Example

```
class conditional {
    public static void main(String[] args) {
        int x = 1;

        if (x > 4) {
            System.out.println("x is greater than 4");
```

```
        }
        else {
            System.out.println("x is less than 4");
        }
    }
}
```

Explanation

The details for the `if` clause is the same. The `else` part is described below:

Line 8:

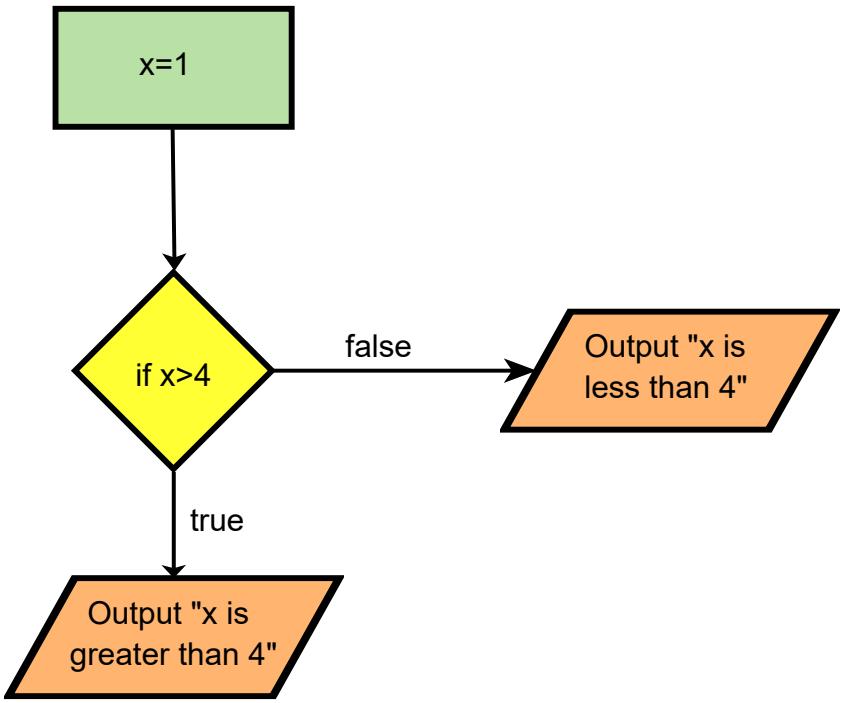
- An `else` statement is defined. The `else` clause does not belong by itself, only directly following an `if` clause.

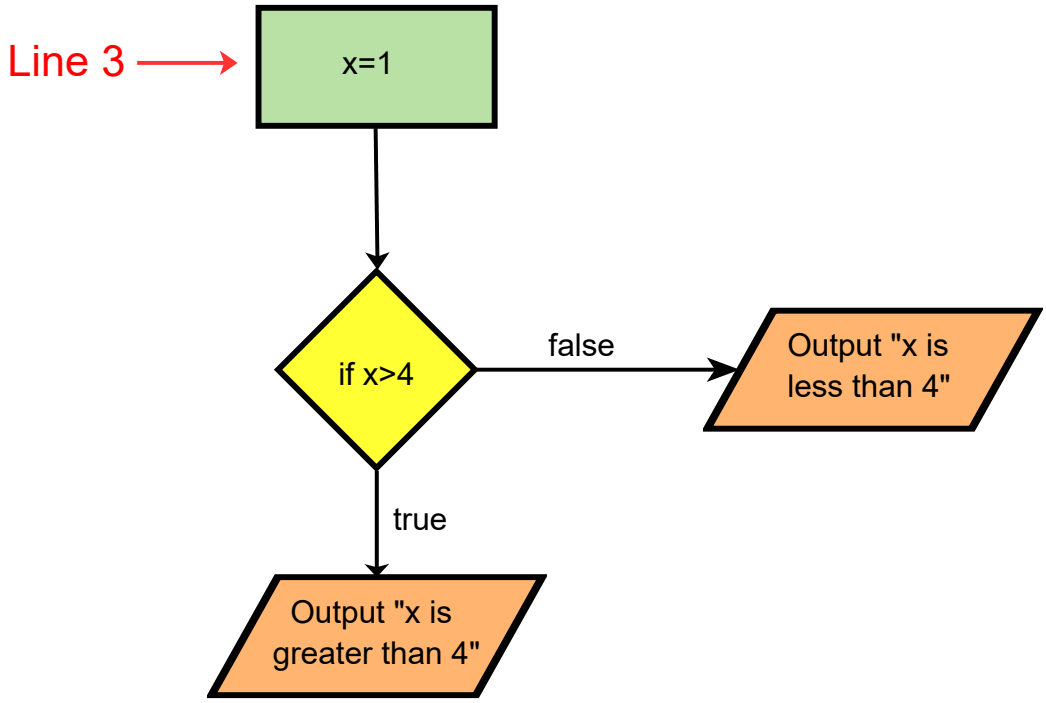
Line 9:

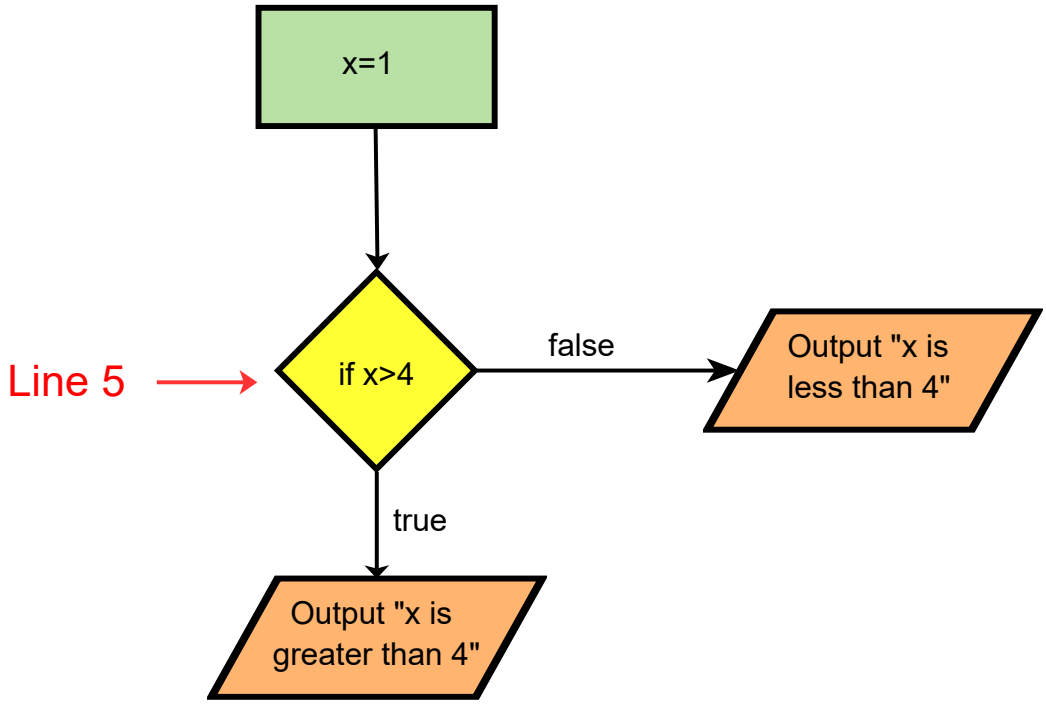
- This is the body of the `else` clause.

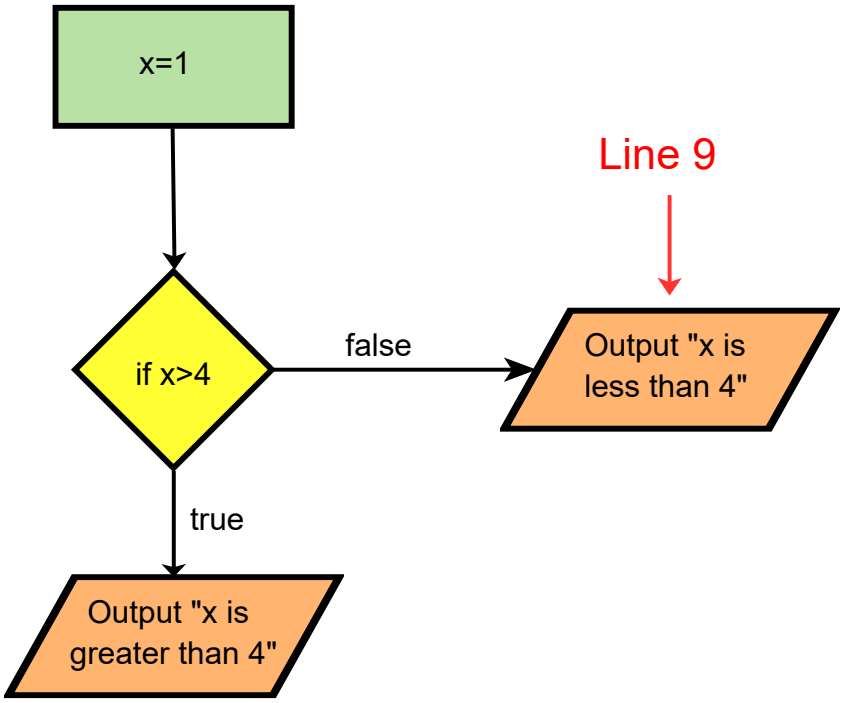
Line 10:

- This *curly* brace is also **essential**; it matches the *opening* brace on line **8** and signals the end of the `else` body.




Line 3
x=1
if x>4
false
Output "x is less than 4"
true
Output "x is greater than 4"


x=1
Line 5
if x>4
false
Output "x is less than 4"
true
Output "x is greater than 4"



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The `if-else if` statement

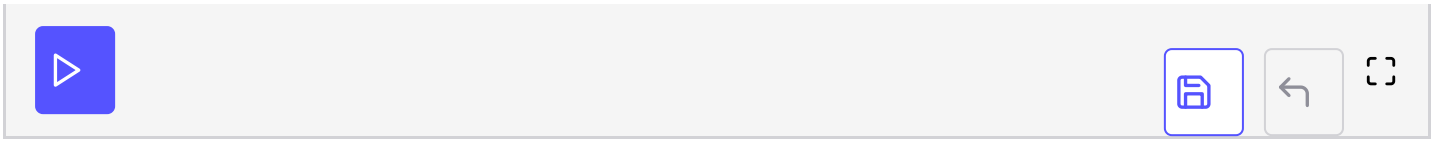
When multiple conditions need to be checked, and certain operations are related to every condition being true, then the `if-else if` clause comes into play. It will step by step check all conditions until one is true. Then the statements under that condition will be executed, and rest will be ignored. Let's understand this with the below example:

Example

```
class conditional {
    public static void main(String[] args) {
        int x = 4;

        if (x > 4) {
            System.out.println("x is greater than 4");
        }
        else if (x == 4) {
            System.out.println("x is equal to 4");
        }
        else {
            System.out.println("x is less than 4");
        }
    }
```

```
}
```



Explanation #

The detail for the `if` and `else` clause is the same. The `else if` part is described below:

Line 8:

- An `else if` statement is defined. The `else if` clause also does not belong by itself, only directly following an `if` clause.

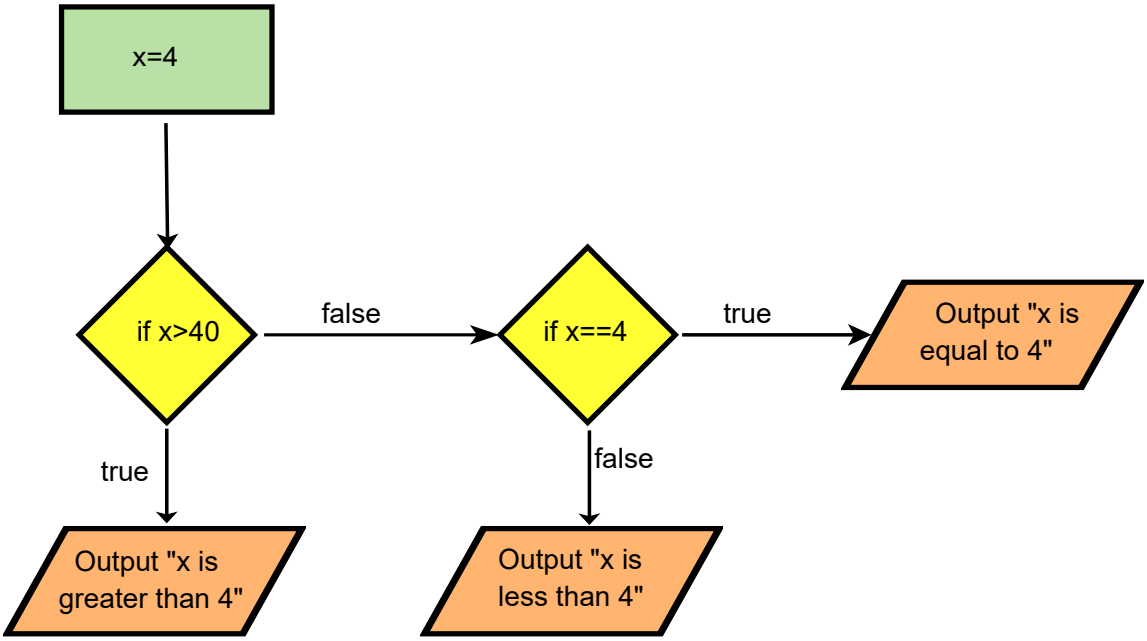
Line 9:

- This is the body of the `else if` clause.

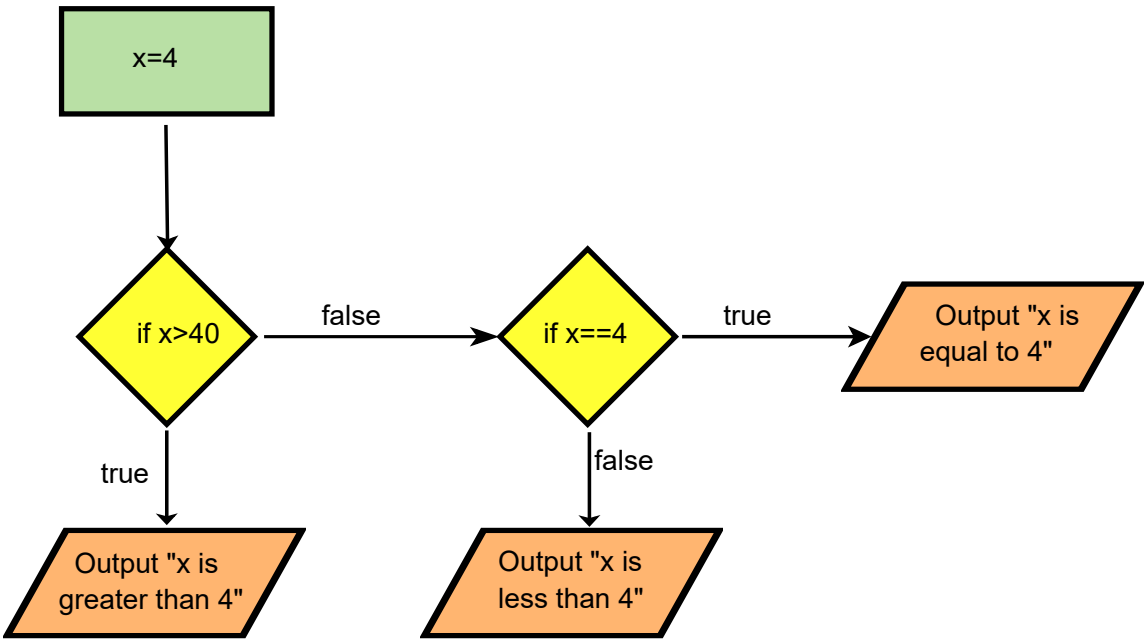
Line 10:

- This *curly* brace is also **essential**; it matches the *opening* brace on line **11** and signals the end of the `else if` body.

> **Note:** *It is not mandatory that an `else` clause always follows `else if`. It depends on the problem and the programmer's choice.*


x=4
if x>40
false
if x==4
true
Output "x is equal to 4"
true
false
Output "x is greater than 4"
Output "x is less than 4"

Line 3


x=4
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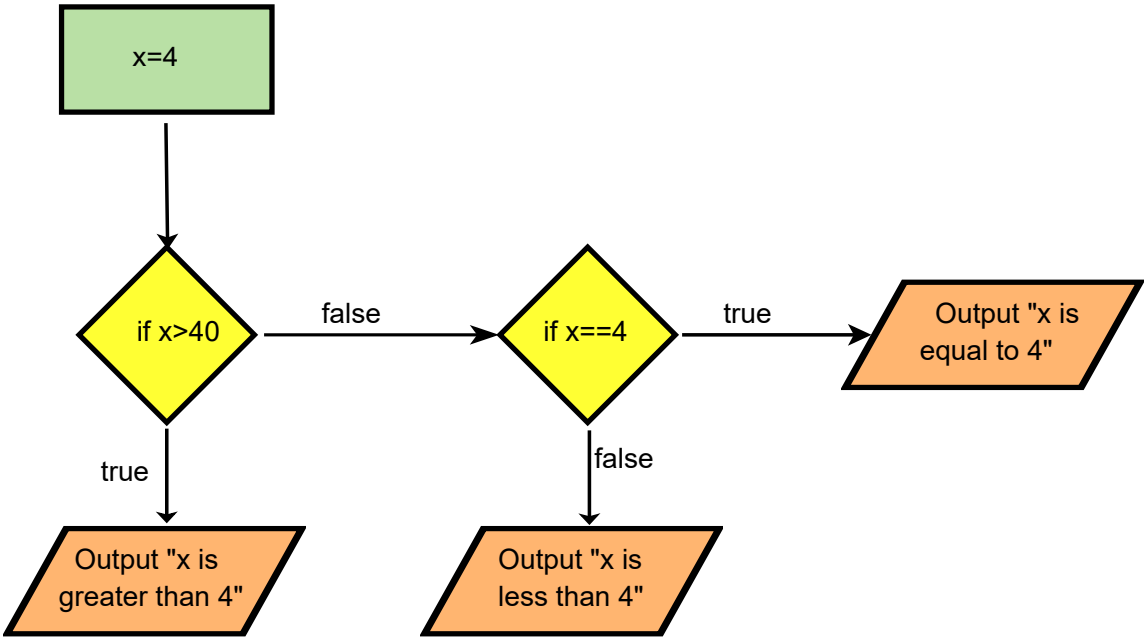
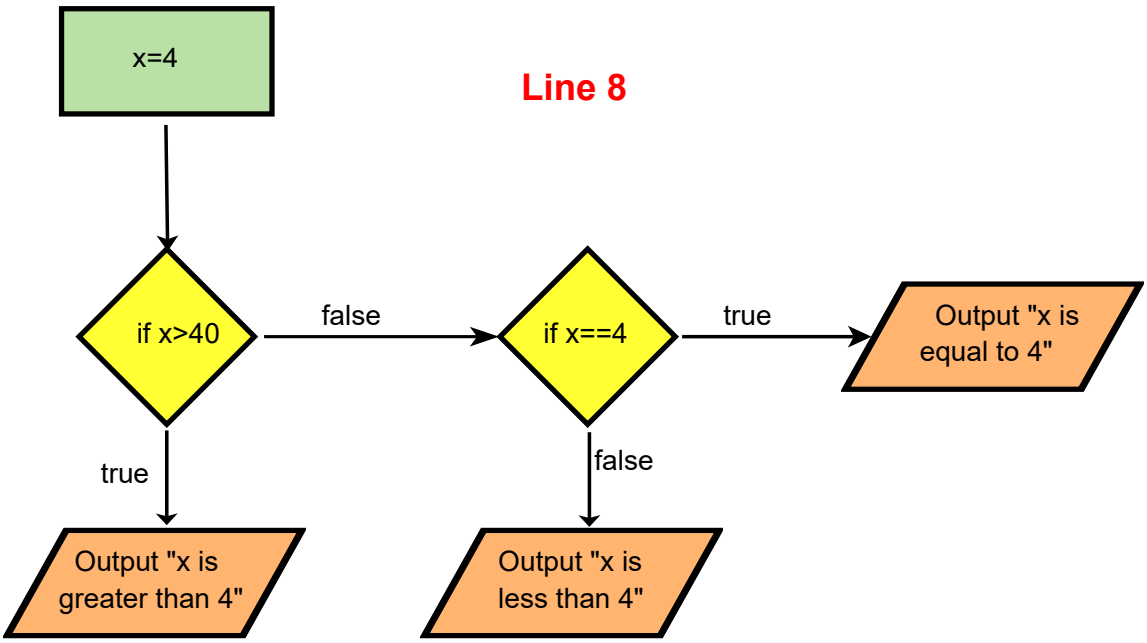
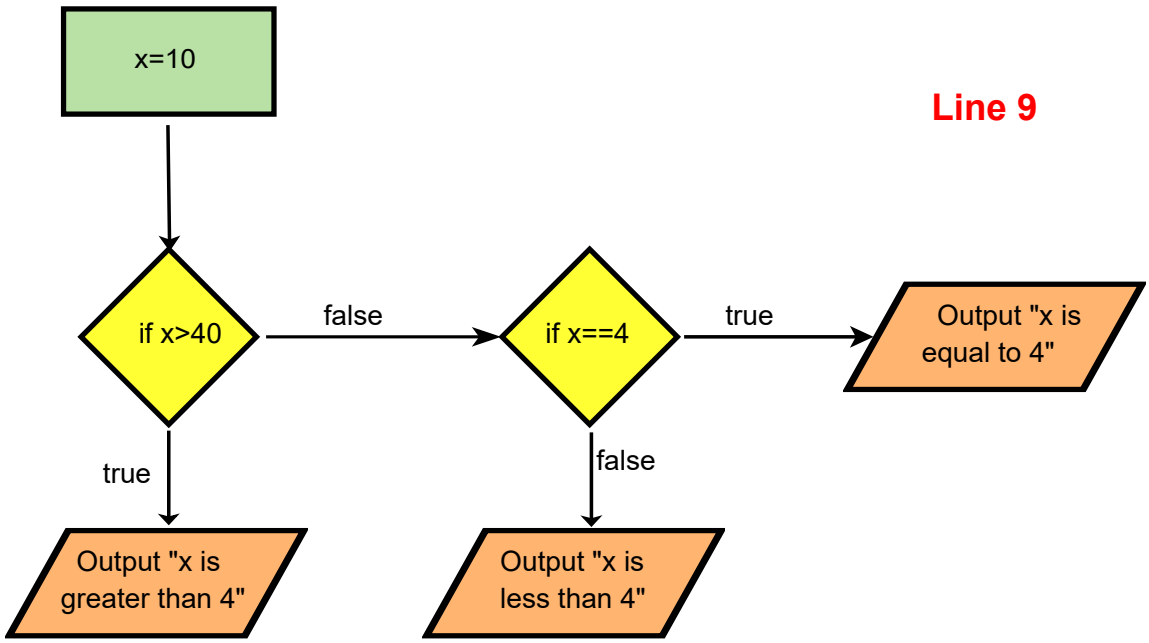
false
if x==4
true
Output "x is equal to 4"
true
false
Output "x is greater than 4"
Output "x is less than 4"

Line 5


x=4
if x>40
false
if x==4
true
Output "x is equal to 4"
true
false
Output "x is greater than 4"
Output "x is less than 4"

Line 8


x=4
if x>40
false
if x==4
true
Output "x is equal to 4"
true
false
Output "x is greater than 4"
Output "x is less than 4"



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Now let's take a look at the `switch` statements in the upcoming lesson.