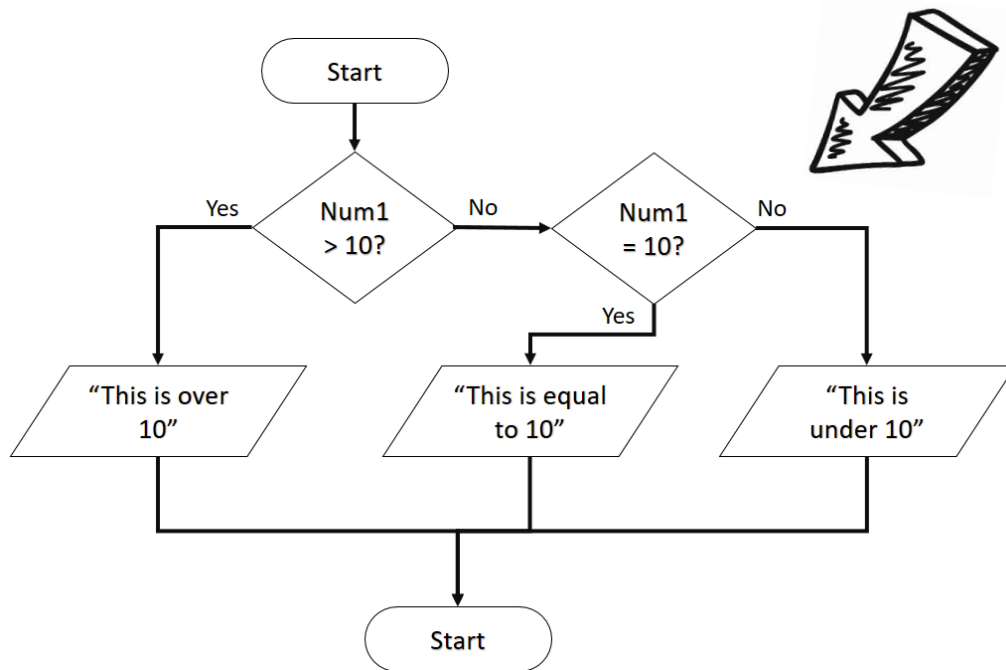


# If Statements

## Explanation

**If statements** allow your program to make a decision and change the route that is taken through the program.



Below is how the if statement for this flow chart would look in Python.



```
if num1 > 10:
    print("This is over 10")
elif num1 == 10:
    print("This is equal to 10")
else:
    print("This is under 10")
```



# Indenting Lines of Code

Indenting is very important in Python as it shows the lines that are dependent on others, as shown in the example on the previous page. In order to indent text you can use your **[Tab]** key or you can press your **[space key]** five times. The **[backspace]** key will remove indents.

The first line of the if statement tests a condition, and if that condition is met (i.e. the first condition is true) then the lines of code directly below it are run. If it is not met (i.e. the first condition is false) it will test the second condition, if there is one, and so on. Below are examples of the different comparison and logical operators you can use in the condition line of your if statement.

## Comparison Operators

Operator	Description
<b>==</b>	Equal to
<b>!=</b>	Not equal to
<b>&gt;</b>	Greater than
<b>&lt;</b>	Less than
<b>&gt;=</b>	Greater than or equal to
<b>&lt;=</b>	Less than or equal to

## Logical Operators

Operator	Description
<b>and</b>	Both conditions must be met
<b>or</b>	Either condition must be met



# Example Code

Please note: In the examples shown, num is a variable entered by the user that has been stored as an integer.



```
if num > 10:
    print("This is over 10")
else:
    print("This is not over 10")
```

If num1 is over 10, it will display the message "This is over 10", otherwise it will display the message "This is under 10".

```
if num > 10:
    print("This is over 10")
elif num == 10:
    print("This is equal to 10")
else:
    print("This is under 10")
```

If num1 is over 10, it will display the message "This is over 10", otherwise it will check the next condition. If num1 is equal to 10, it will display the message "This is equal to 10". Otherwise, if neither of the first two conditions have been met, it will display the message "This is under 10".



```
if num >= 10:
    if num <= 20:
        print("This is between 10 and 20")
    else:
        print("This is over 20")
else:
    print("This is under 10")
```

If num1 is 10 or more then it will test another if statement to see if num1 is less than or equal to 20. If it is, it will display the message "This is between 10 and 20". If num1 is not less than or equal to 20 then it will display the message "This is over 20". If num1 is not over 10, it will display the message "This is under 10".



```
text = str.lower(text)
```

Changes the text to lower case. As Python is case sensitive, this changes the data input by the user into lower case so it is easier to check.

```
num = int(input("Enter a number between 10 and 20: "))  
if num >= 10 and num <= 20:  
    print("Thank you")  
else:  
    print("Out of range")
```

This uses **and** to test multiple conditions in the if statement. Both the conditions must be met to produce the output "Thank you".

```
num = int(input("Enter an EVEN number between 1 and 5: "))  
if num == 2 or num == 4:  
    print("Thank you")  
else:  
    print("Incorrect")
```

This uses **or** to test the conditions in the if statement. Just one condition must be met to display the output "Thank you".



# Challenges

## 012

Ask for two numbers. If the first one is larger than the second, display the second number first and then the first number, otherwise show the first number first and then the second.

## 013

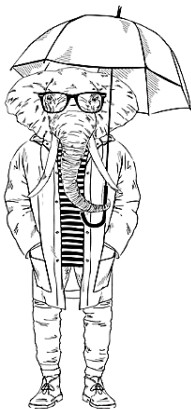
Ask the user to enter a number that is under 20. If they enter a number that is 20 or more, display the message "Too high", otherwise display "Thank you".

## 014

Ask the user to enter a number between 10 and 20 (inclusive). If they enter a number within this range, display the message "Thank you", otherwise display the message "Incorrect answer".

## 015

Ask the user to enter their favourite colour. If they enter "red", "RED" or "Red" display the message "I like red too", otherwise display the message "I don't like [colour], I prefer red".



## 016

Ask the user if it is raining and convert their answer to lower case so it doesn't matter what case they type it in. If they answer "yes", ask if it is windy. If they answer "yes" to this second question, display the answer "It is too windy for an umbrella", otherwise display the message "Take an umbrella". If they did not answer yes to the first question, display the answer "Enjoy your day".

## 017

Ask the user's age. If they are 18 or over, display the message "You can vote", if they are aged 17, display the message "You can learn to drive", if they are 16, display the message "You can buy a lottery ticket", if they are under 16, display the message "You can go Trick-or-Treating".

## 018

Ask the user to enter a number. If it is under 10, display the message "Too low", if their number is between 10 and 20, display "Correct", otherwise display "Too high".

## 019

Ask the user to enter 1, 2 or 3. If they enter a 1, display the message "Thank you", if they enter a 2, display "Well done", if they enter a 3, display "Correct". If they enter anything else, display "Error message".