Python

Control Flow 1

in programming

Control flow in python

Which one you choose

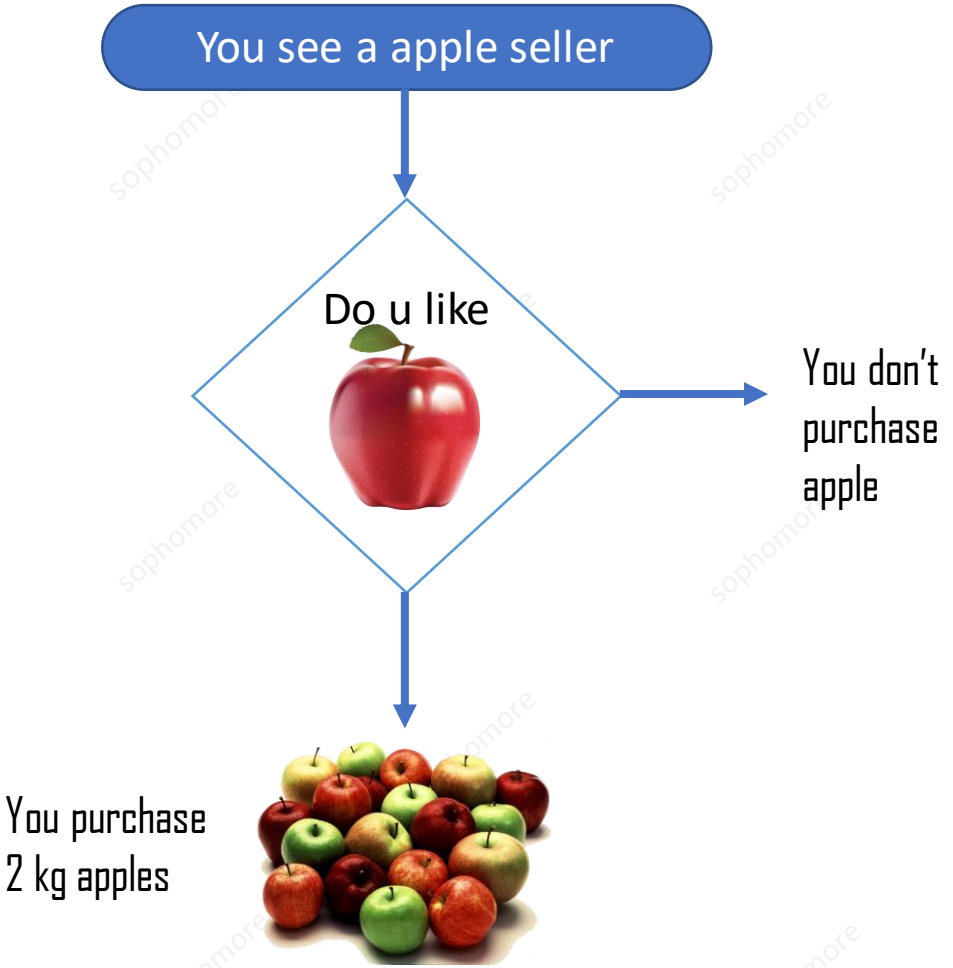
Select a hero  

choice

FLY 

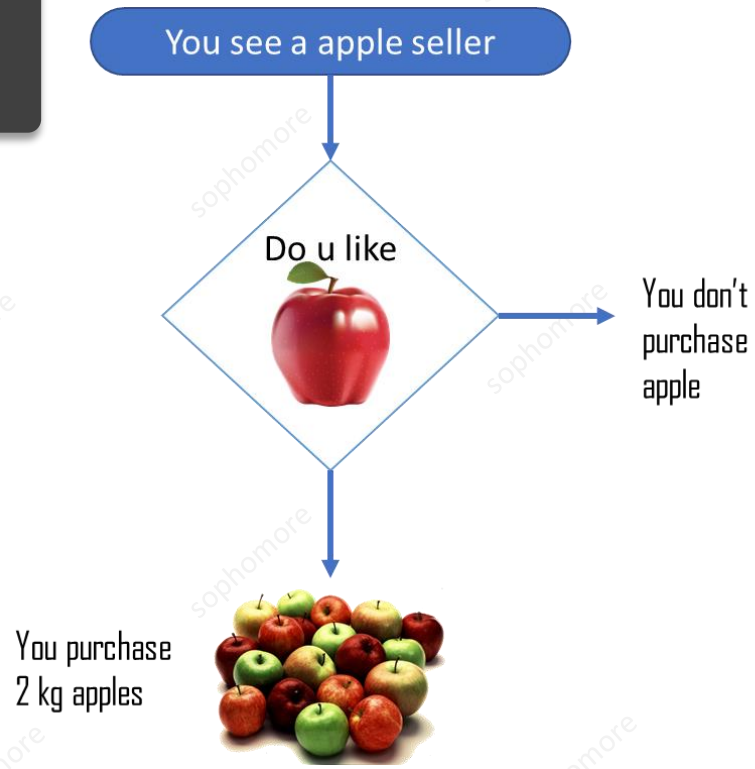
RUN 

Decision making is required when we want to execute a code only if a certain condition is satisfied.



Decision making is required when we want to execute a code only if a certain condition is satisfied.

As you will see, we can also write the diagrammatic representation in English



- You see a apple seller
- Do u like apples
- If yes
- you purchase 2 kg apples
- If no
- you don't purchase apple

Decision making is required when we want to execute a code only if a certain condition is satisfied.

Making a choice

In real life, we have to say **some words** to specify what is a condition and **what action** we are going to take.

- if
- while
- when
- else
- अगर
- मगर

You see a apple seller

Do u like apples

If yes — condition

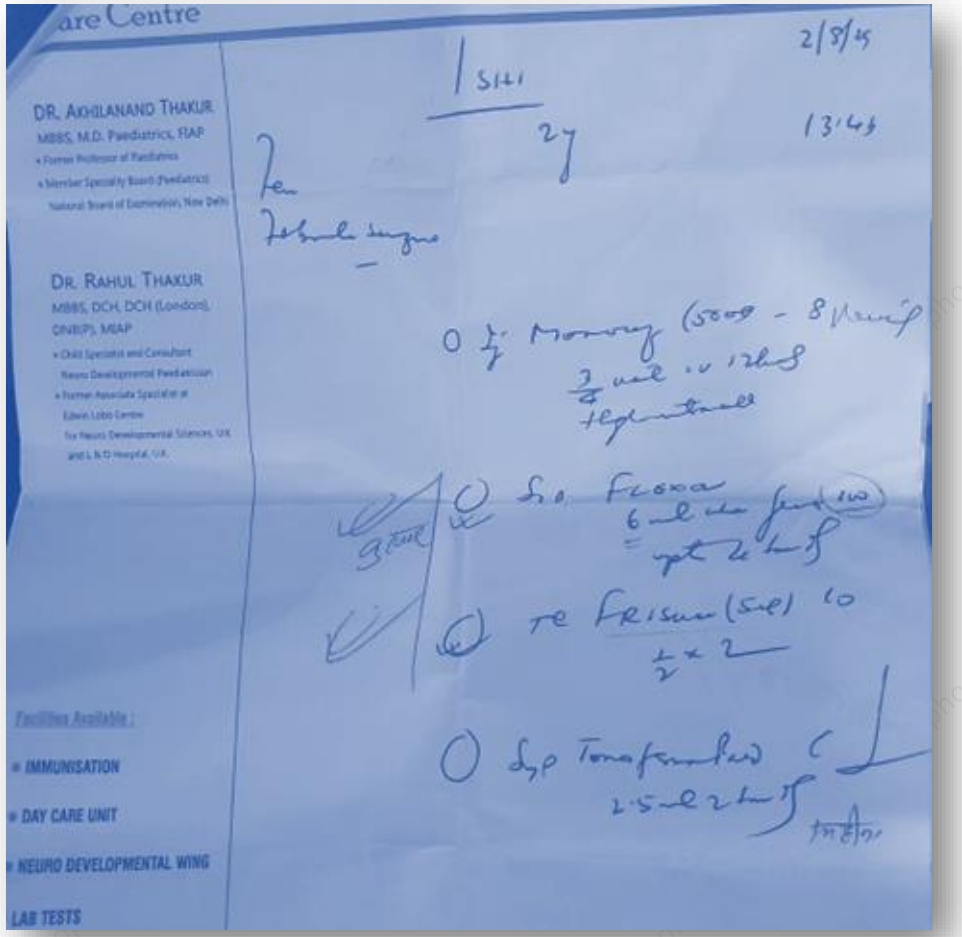
you purchase 2 kg apples — action

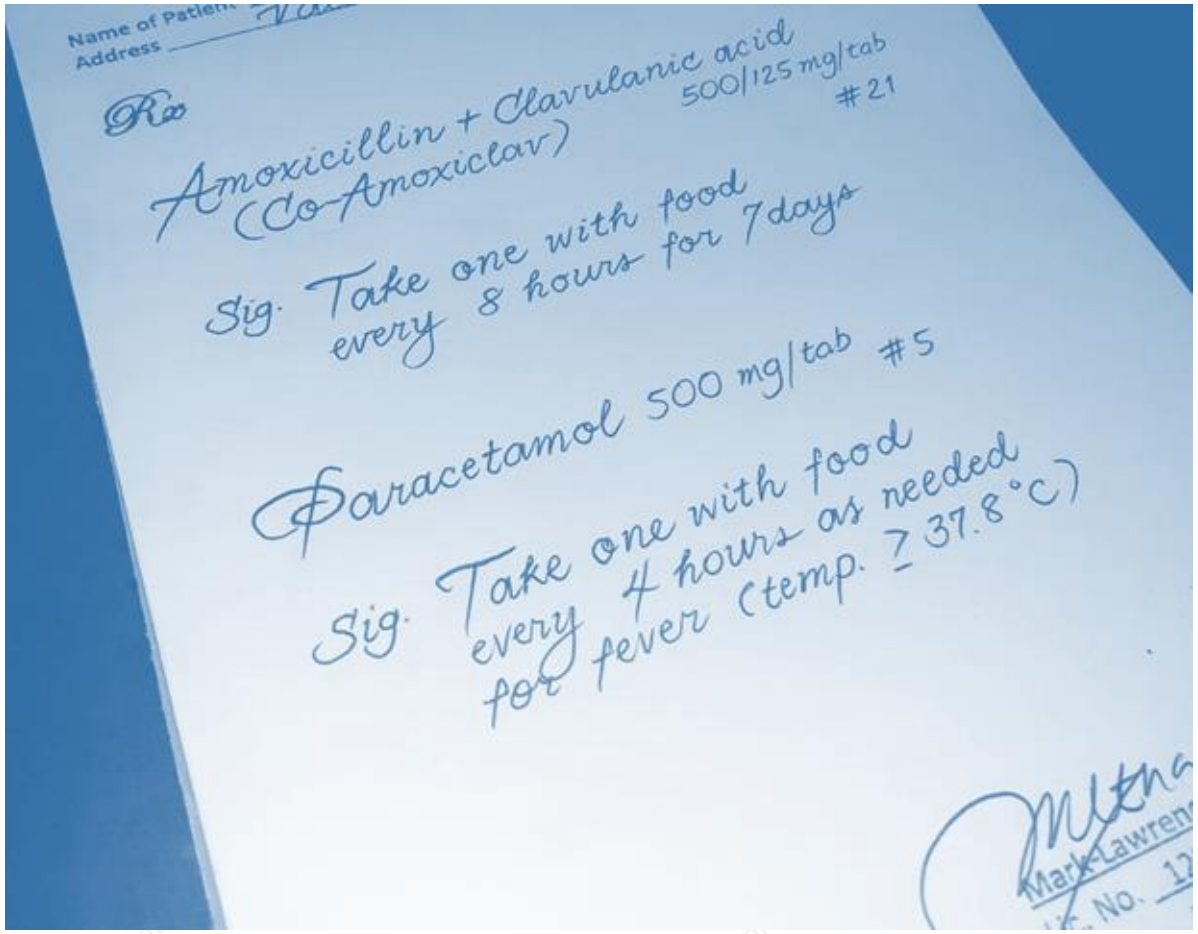
If no — condition

you don't purchase apple — action

Coding Style – how to write

Which one do you understand





*No doctors/patients were harmed during this process

PYTHON

Sophomore

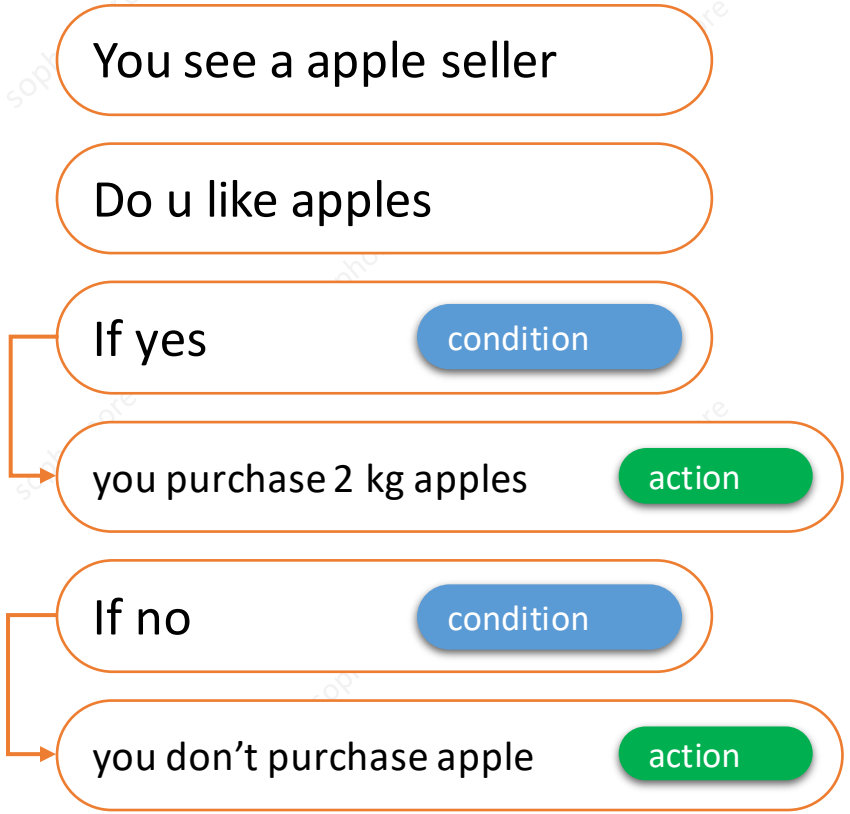
Code Style /formatting

It gets difficult to understand a messed up handwriting, similarly an unreadable and unstructured code is not accepted.

The coding style in python is called PEP 8 (Python Enhancement Proposal)

PEP 8 adds a logical meaning to your code. Some key terms that we are going to use are

- Indentation
- Variable naming
- spacing
- commenting

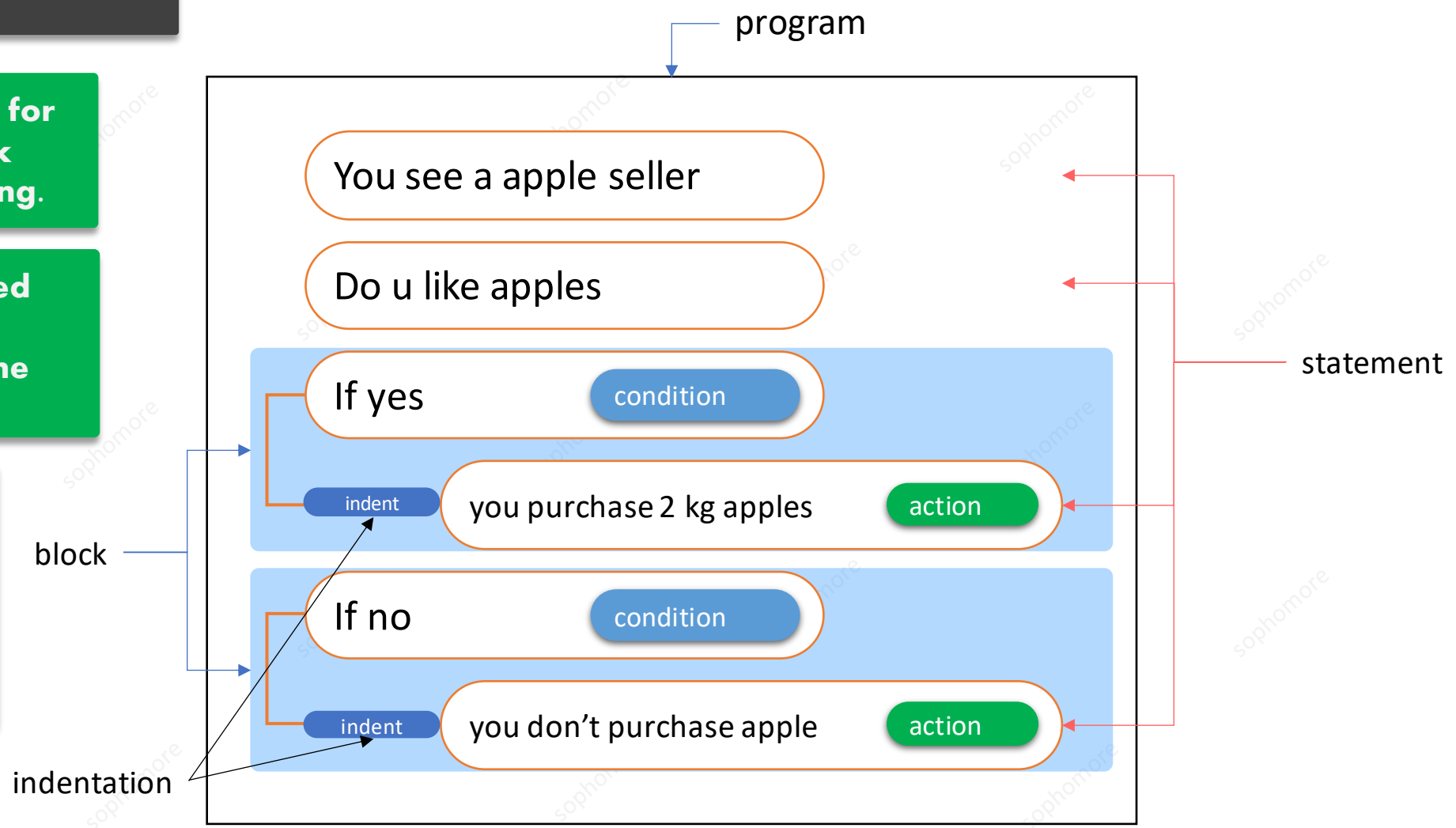


Blocks and indentation

Block are group of code lines for building logic in code. A block will have a starting and ending.

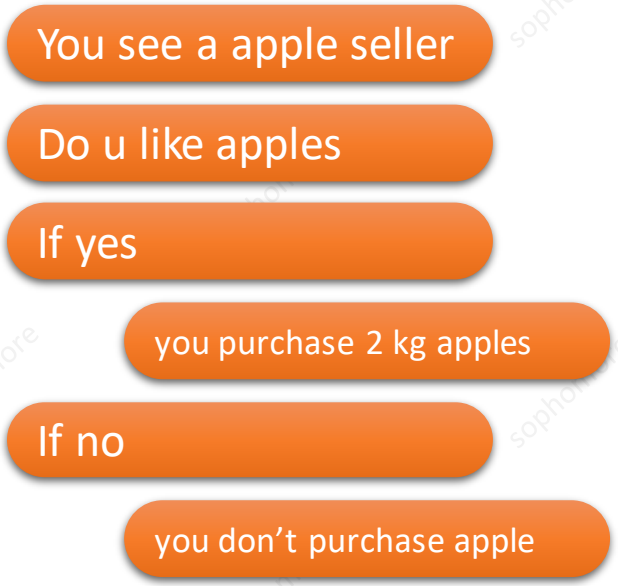
The first line of block is aligned to previous line (statement), while the following lines of the block are indented inside it

Indentation is created by giving 4 spaces to each line inside a block. And to tell python the block is end, we remove the indent



Building logic with if

Normal English



The python code

```
print('you see a apple seller')
q = input('do you like apples ?')

if q == 'yes' :
    print('purchase 2kg of apples')
if q == 'no':
    print('you dont purchase apples')
```

Building logic with if

Python if Statement Syntax

```
if test expression:
    statement(s)
```

The program evaluates the test expression and will execute statement(s) only if the test expression is True

If the test expression is False, the statement(s) is not executed

Example code

```
x = 10
if x > 5:
    print('x is greater than 5')
    print('this is the info we needed')
    print('with this power, comes great responsibility')
print('the end')
```

In Python, the body of the if statement is indicated by the indentation. The body starts with an indentation and the first un-indented line marks the end

Python interprets non-zero values as True. While None and 0 are interpreted as False

Activity

Activity 1: Change this code to normal English but with indentation

Look at this code

```
x = 10
y = 5
if x > y:
    print('x is greater than y')
    print('y is smaller than x')
if y < 6:
    print('y is smaller than 6 also')
    print('why y is smaller')
if y == 3:
    print('y is 3')
    print('Its time to make y greater')
    y = x + y
```

Write the English version of this code in copy

Let, x be 10

Let, y be 5

If x is bigger than y

- X is greater than y
- Y is greater than x

If y is smaller than 6

- Y is smaller than 6 also
- Why y is smaller ?

If y equal to 3

- Y is 3
- Its time to make y greater
- Add value of x and y and keep it in y

lets code more examples

Building logic with if else

Python if else Statement Syntax

```
if test expression:
    statement(s)
else:
    statement(s)
```

An else block can be combined with an if statement.

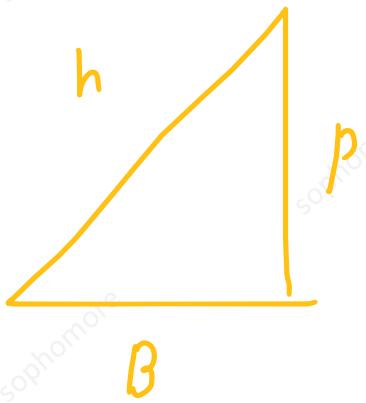
The else part contains the block of code that executes if the condition in the if expression is 0 or False.

Example code

```
temp = float(input('What is the temperature? '))
if temp > 70:
    print('Wear shorts.')
else:
    print('Wear long pants.')
print('Get some exercise outside.')
```

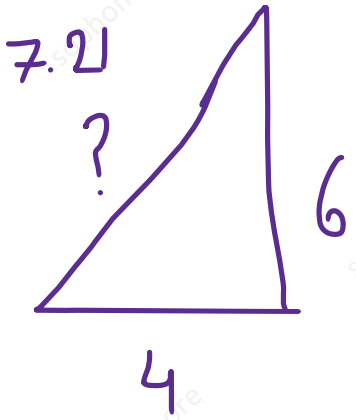
Important thing to remember

The else keyword is an optional statement and there could be at most only one else statement following if.



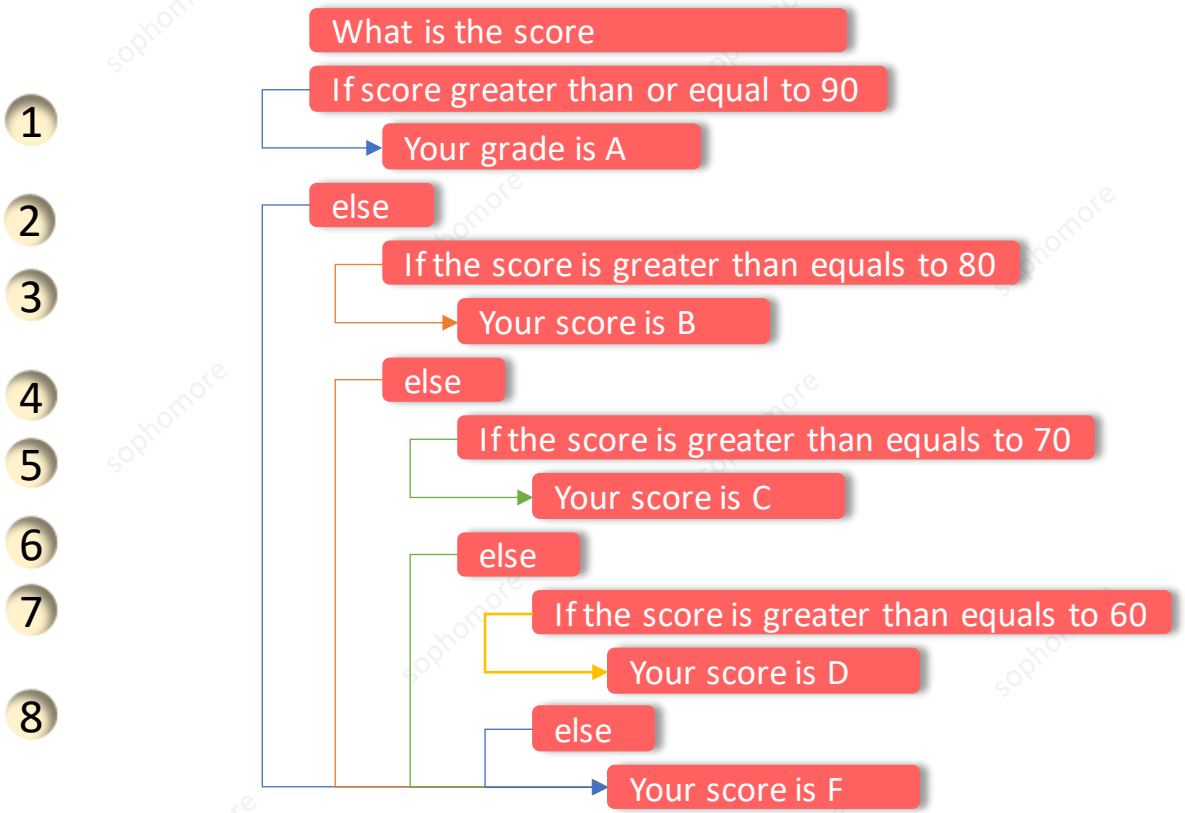
Pythagoras:

$$\Rightarrow h = \sqrt{p^2 + b^2}$$

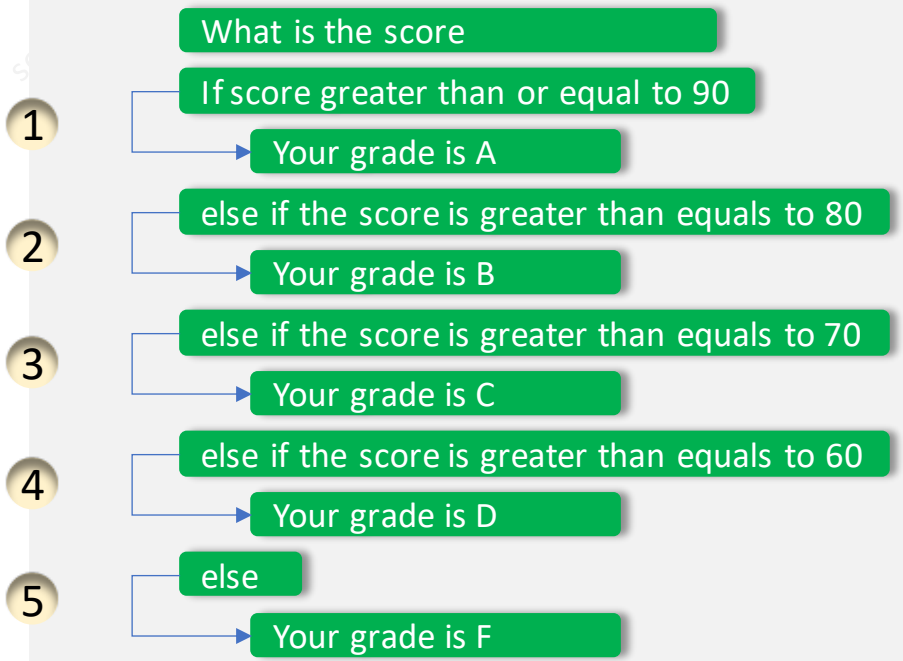


Building logic with if-elif-else

Multiple expression



If else complex version



If else easy combined version

The elif Statement

```
if expression1:
   statement(s)
elif expression2:
   statement(s)
elif expression3:
   statement(s)
else:
   statement(s)
```

The **elif** keyword allows us to check multiple expressions for True and execute a block of code as soon as one of the conditions evaluates to True

The **elif block** is optional. However, unlike **else**, for which there can be at most one statement, there can be an any number of **elif** statements following an if.

Important thing to remember

```
score = int(input('your score ->'))
if score >= 90:
    letter = 'A'
elif score >= 80:
    letter = 'B'
elif score >= 70:
    letter = 'C'
elif score >= 60:
    letter = 'D'
else:
    letter = 'F'
print(letter)
```

Coding time

If-Then-Else in One Line

Python is so powerful, you can even compress whole algorithms in a single line of code.

Can you write conditional if-then-else statements in a single line of code?

YES

you can write most if statements in a single line of Python using any of the following methods

Write the **if statement without else branch** as a Python one-liner

```
# One-Liner Alternative 1:
if 42 in range(100): print("42")
```

If you want to set a variable, use the [ternary operator]

```
# One-Liner Alternative 2:
x = "Alice" if "Jon" in "My name is Jonas" else "Bob"
print(x)
```

If you want to conditionally execute a function, still use the **ternary operator**

```
# One-Liner Alternative 3:
print("42") if 42 in [22,33,42] else print("21")
```

Lets code

Assignment for

level 4

click here

THE END