

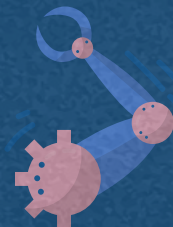
COMPUTER SCIENCE CLUB

Intro To Python

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Introduction

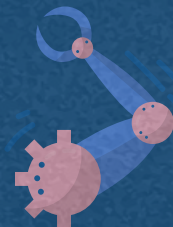


Introduction

- A programming language is a set of grammatical rules to instruct the computer to achieve a task
- Python is an example of a programming language
- They are often used to manipulate data
- Data can be of different forms
- These different forms are called data types



Data Types



Data types

- int: stands for integer, refers to any whole positive or negative number WITHOUT a decimal

A terminal window with a blue background and a black title bar containing three colored dots (red, yellow, green). The number 37 is displayed in white text.

37

A terminal window with a blue background and a black title bar containing three colored dots (red, yellow, green). A long integer is displayed in white text.

7897917232132121313467835023

Data types

- float: stands for floating point number, refers to a positive or negative number with a decimal point

A terminal window icon with three colored dots (red, yellow, green) at the top, displaying the text "1.4" in a monospaced font.

1.4

A terminal window icon with three colored dots (red, yellow, green) at the top, displaying the text "5.0" in a monospaced font.

5.0

A terminal window icon with three colored dots (red, yellow, green) at the top, displaying the text "123.343234" in a monospaced font.

123.343234

Data types

- str: this stands for string, refers to anything enclosed within ""



```
"JFSS CS Club"
```



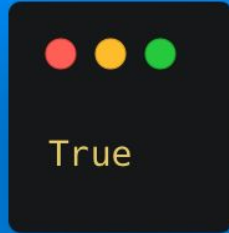
```
"123"
```



```
"."
```

Data types

- bool: this stands for boolean, can hold two values either true or false



Arithmetic Operators

- For int and float data types in Python, we can carry out arithmetic operations, just like you would do in math
- Operators include
 - Addition: Adds the numbers, denoted by +
 - Subtraction: Subtracts the numbers, denoted by -
 - Multiplication: Multiplies the numbers, denoted by *
 - Division: Divides the numbers, denoted by /
 - Modulo: Gives the remainder when the first number is divided by the second, denoted by %

Arithmetic Operators

Addition

```
print(4+5)
```

9

Subtraction

```
print(17-6)
```

11

Arithmetic Operators

Multiplication

```
print(5*3)
```

15

Division

```
print(14/3)
```

4.666666666666667

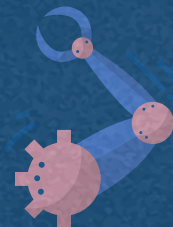
Arithmetic Operators

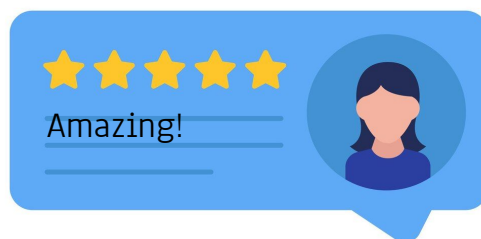
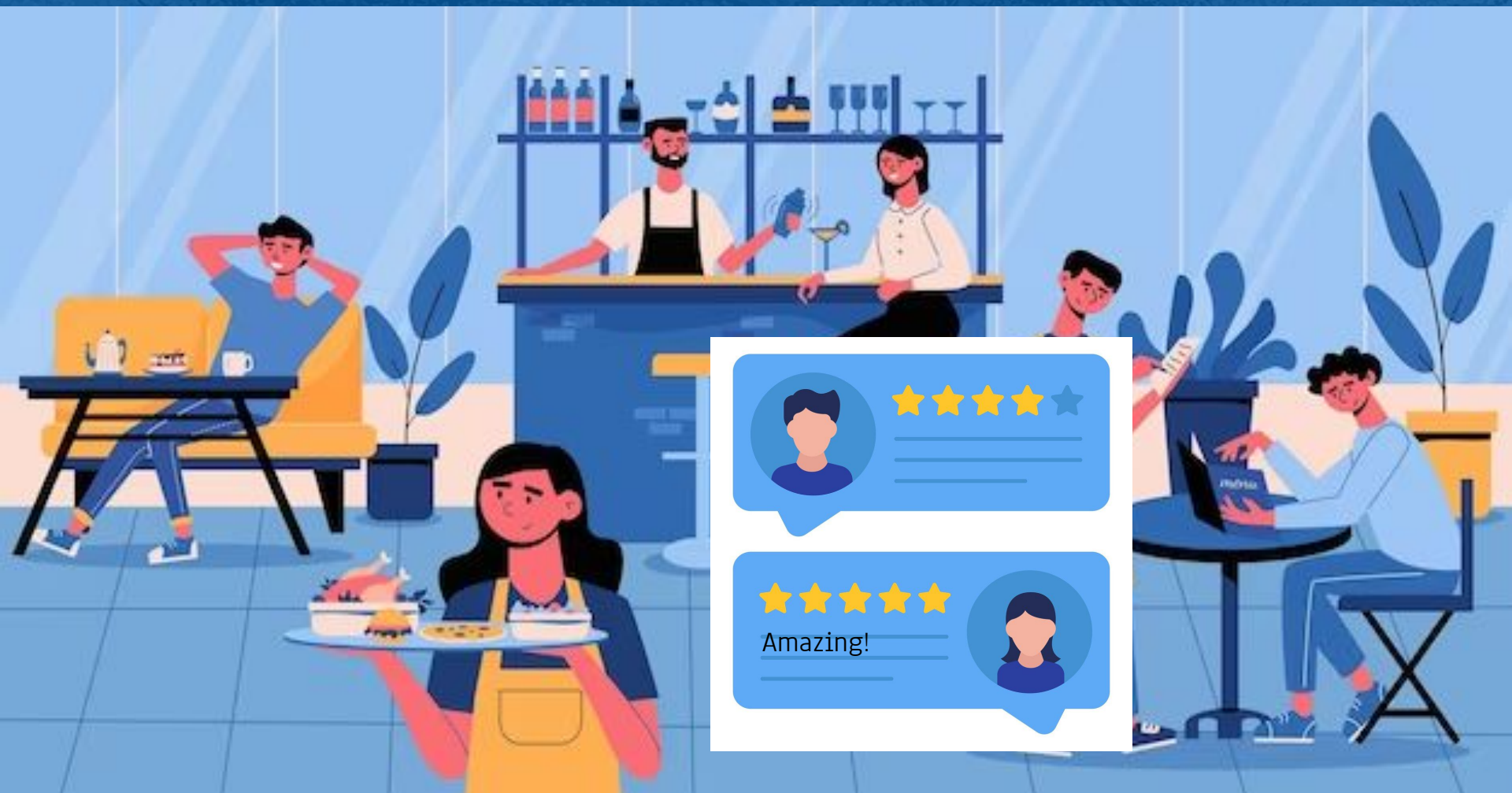
Modulo

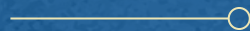
```
print(25%2)
```

```
1
```

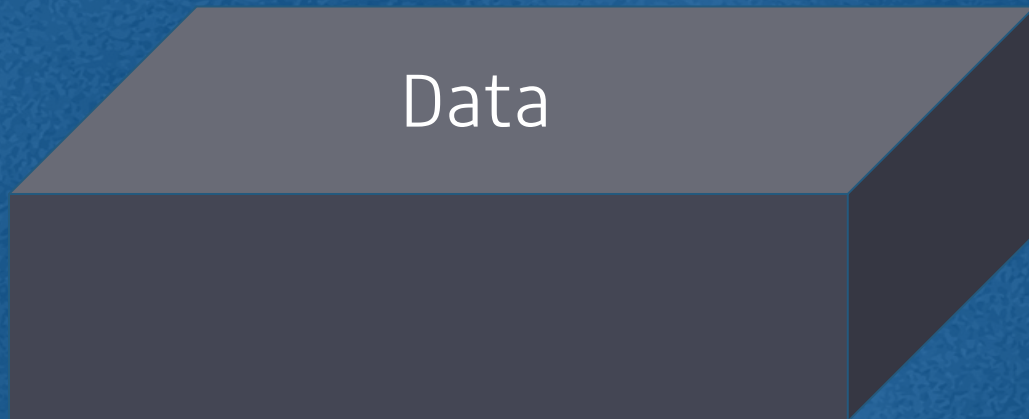

Variables







Variables



Variables

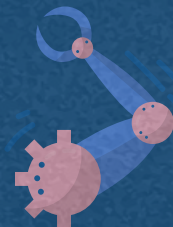
- Variables are things that can store any value assigned to them
- The process of assigning a variable a value is called variable declaration
- Syntax of a python variable:
 - Name of the variable followed by
 - An equal sign =
 - And then the value that the variable is meant to hold
 - **Note:** remember this would be either one of the data types mentioned above

Variables



```
schoolName = "John Fraser Secondary  
School"  
myLuckyNumber = 2345  
  
grade = 90.7  
  
isRaining = True
```

Conditional Statements



But First...

Printing text into console

```
1 print("Hello World")
```

Output:

```
Hello World
```

Comments

```
1 #Hello I am a comment, I do not do anything to the code, I am here for descriptive  
  purposes  
2 print("Hello World") # python print function, printing the string "Hello World"  
3
```

If Statements

```
if name=="Shivendraa":  
    print("Who prefers to be called Shiv")
```

- == when comparing
- : after condition

```
if grade>90:  
    print("Doing well in the course")
```

> more than

```
if grade<90:  
    print("Good job, Keep going!")
```

< less than

Other Comparison Operators

```
if name!="Shiv":  
    print("Who are you")
```

!= means not equal to

```
if grade>=90:
```

More than or equal to

```
if grade<=90:
```

Less than or equal to

Combining conditions (and, or)

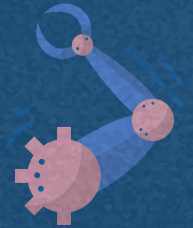
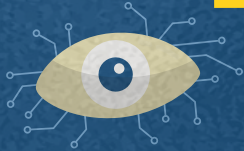
and: Both conditions have to be true for code to run

```
if score==130 and movie_series=="Harry Potter":  
    print("You are a Muggle")
```

or: if any condition is true, or if both are true, then run the code.

```
if movie_choice1=="Harry Potter" or movie_choice2=="The secrets of Dumbledore"  
    print("Welcome Harry Potter fan")
```


If, elif and else Bank ATM Program





Accepting User Input

```
choice=input("Enter a number from 1-3") # getting user input
```

- User input is stored in the choice variable
- User input is always given as a **string**

```
Enter a number from 1-3
```


Handling User Input-Choice 1

```
choice=input("Enter a number from 1-3") # getting user input
if choice=='1':
    print("You chose 1. Here is your bank balance:")
```

1. Gets user input
2. If user input is 1, give them their bank balance

Why do we have to put '1'
in quotes?



Handling User Input-Choice 2

```
choice=input("Enter a number from 1-3") # getting user input
if choice=='1':
    print("You chose 1. Here is your bank balance:")
elif choice=='2':
    print("You chose 2. How much money do you want to deposit")
```

1. Gets user input
2. If user input is 1, give them their bank balance
3. If not, then check if user input is 2

Handling User Input-Choice 3

```
choice=input("Enter a number from 1-3") # getting user input
if choice=='1':
    print("You chose 1. Here is your bank balance:")
elif choice=='2':
    print("You chose 2. How much money do you want to deposit")
elif choice=='3':
    print("You chose 3. How much money do you want to withdraw")
```

1. Gets user input
2. If user input is 1, give them their bank balance
3. If not, then check if user input is 2
4. If not, then check if user input is 3

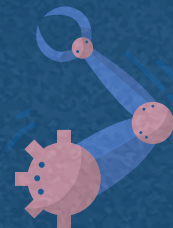


Handling Invalid Inputs

```
choice=input("Enter a number from 1-3") # getting user input
if choice=='1':
    print("You chose 1. Here is your bank balance:")
elif choice=='2':
    print("You chose 2. How much money do you want to deposit")
elif choice=='3':
    print("You chose 3. How much money do you want to withdraw")
else:
    print("ERROR: Please enter a number from 1-3")
```

1. Gets user input
2. If user input is 1, give them their bank balance
3. Otherwise check if user input is 2
4. Otherwise check if user input is 3
5. **Else: if none of the above are true, print error**

Activity Time



Make Your Own If statement

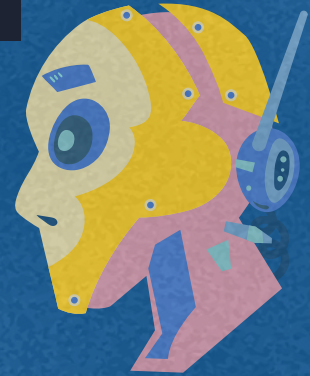
```
grade=int(input("Enter your grade:"))
```

Beginner

If grade is more than or equal to 50,
print pass, else print fail

Example
Syntax:

```
if percentage>=30:  
    print("more than 30")  
else:  
    print("Less than 30")
```



Experienced

If grade is from 85 to 95 set grade to 100,
else +5 to the grade.
If after adding 5, grade is more than 100,
print("bonus")

Solutions

Beginner

If grade is more than or equal to 50,
print pass, else print fail

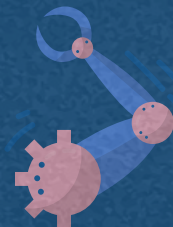
```
grade=int(input("Enter your grade:"))
if grade>=50:
    print("pass")
else:
    print("Fail")
```

Experienced

If grade is from 85 to 95 set grade to 100,
else +5 to the grade.
If after adding 5, grade is more than 100,
print("bonus")

```
grade = int(input("Enter your grade: ")) # get user input
#if grade is between 85 and 95, set grade to 100, else add 5 to grade
if 85 <= grade <= 95:
    grade = 100
else:
    grade += 5
#if grade is more than 100 print bonus
if grade > 100:
    print("bonus")
```

For Loops



For loops



For loops

```
for chocolate in boxOfChocolates:  
    pick up chocolate  
    unwrap chocolate  
    eat chocolate
```


For Loops

Basic Syntax

```
for variable in iterable:  
    print(variable)
```

Looping through a string:

```
for c in "Hello":  
    print(c)
```

Output:

```
H  
e  
l  
l  
o
```



For Loops

Looping Through a Range:

Loop from 0 to 4

```
for i in range(5):  
    print(i)
```

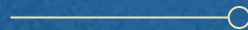
0
1
2
3
4

- Range includes first_num -> last_num-1
- Never includes last number

Loop from 3 to 7

```
for i in range(3,8):  
    print(i)
```

3
4
5
6
7



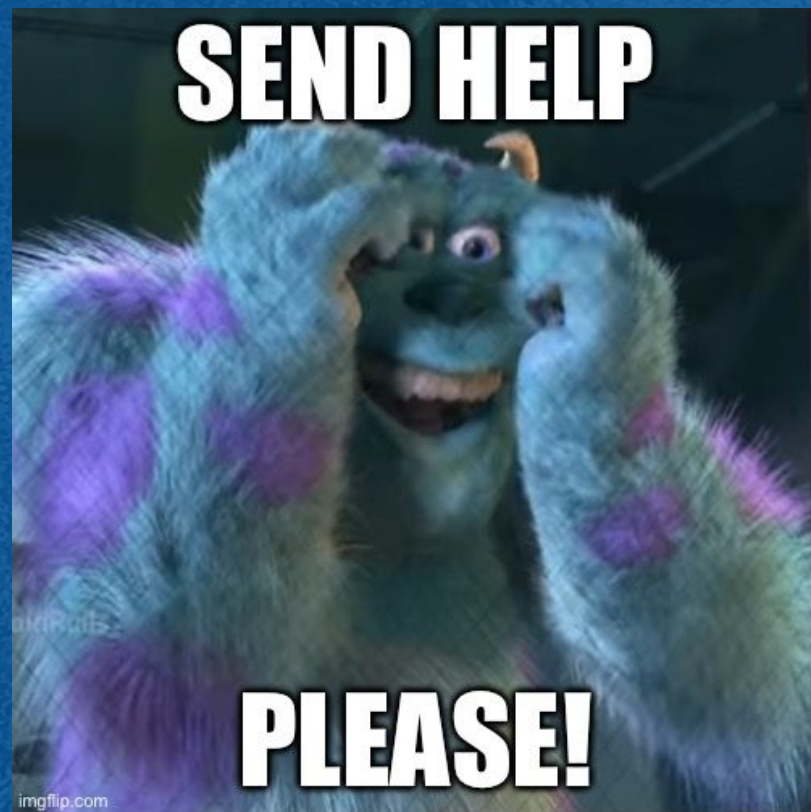
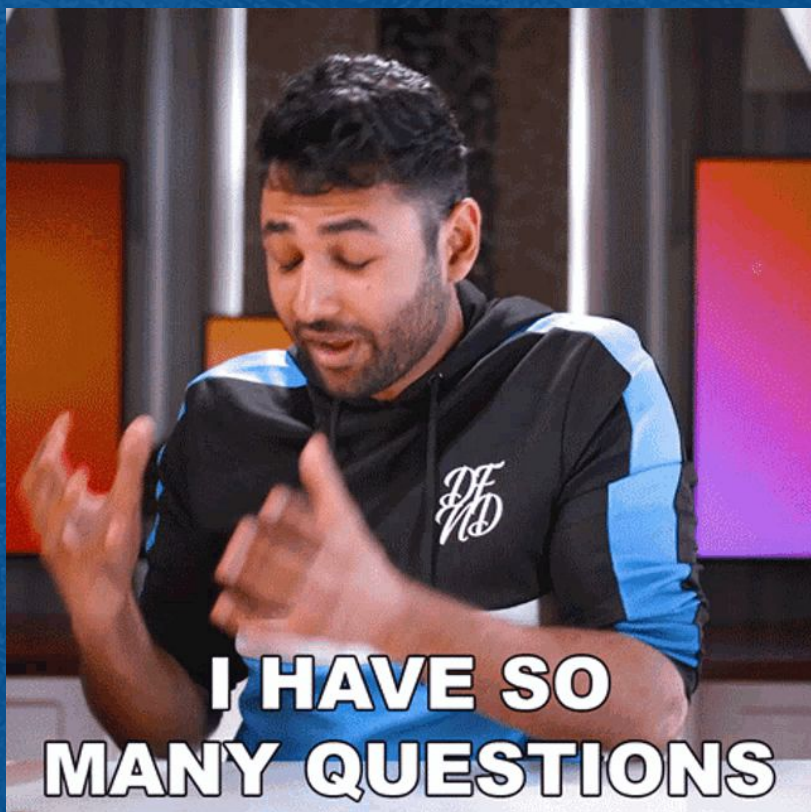
What will happen?

```
for i in range(10,20):  
    print(i+2)
```

Solution: What will happen?

```
for i in range(10,20):  
    print(i+2)
```

12
13
14
15
16
17
18
19
20
21



Lesson Challenge

Start with: `fahrenheit = int(input("Enter the temperature in fahrenheit"))`

Convert next 5°F to °C. So if °F=32, convert 32,33,34,35,36F to °C.

- Use: `(fahrenheit - 32) * 5/9`

For each degrees:

Display each conversion

If celsius is from 25 to 35, print summer

If celsius is from 14-24, print fall

If celsius is from 3-13 print, spring

If celsius is from -30 to 2 print winter

Else print anything

Challenge Solution

```
1  #convert the user input from a string to a integer
2  fahrenheit = int(input("Enter the temperature in fahrenheit"))
3
4  for i in range(5):
5      #Add i to the original fahrenheit value, i automatically increases by 1 every loop
6      celsius = ((fahrenheit+i) - 32) * 5/9
7      print(celsius)
8
9      if 25 <= celsius <= 35:
10         print("summer")
11     elif 14 <= celsius <= 24:
12         print("fall")
13     elif 3 <= celsius <= 13:
14         print("spring")
15     elif -30 <= celsius <= 2:
16         print("winter")
17     else:
18         print("You're not in Canada")
```

THANK
YOU!

