

* Variables & Data Types

variable → a reusable container for storing a value
a variable behaves as if it were
the value it contains

age = 21

print(age) // 21

print("age") // age

=
print("You are " + str(age) + " years old")
 ↑
 ↴ ↴
 casting ← str(int نویسیدن که این داده

* print("You are ", age, " years old ")
 ↴ ↴
 ↴ ↴

separate arguments

* F-strings

print(f"You are {age} years old") ← f-string

data types

Integer , Float , String , Boolean

Integer

age = 21

players = 2

quantity = 5

Print(F" You are [age] years old")

Print(F" There are [players] players online")

Print(F" You would like to buy [quantity] items")

~~Float(F"~~

Float

gpa = 3.2

distance = 2.5

price = 10.99

Print(F" Your gpa is [gpa]")

Print(F" You ran [distance] km")

Print(F" The price is \$ [price]")

String

name = "Bro" or 'Bro'

Food = "Pizza"

email = "Bro123@gmail.com"

Print(F" Hello {name}")

Print(F" You like {Food}")

Print(F" Your email is: {email}")

Boolean

online = True

first letter is capital

For-Sale = False

running = True

print(F"Are you online?: {online}")

print(F"Is the item for sale?: {For-Sale}")

print(F"Game running: {running}")

if. running:

print("the game is running")

else:

print("The game is over")

TIPS & TRICKS

X, Y, Z = 1, 2, 3

X = Y = Z = 0

Type Casting = The process of converting a value of one datatype to another
(String, integer, float, boolean)

Explicit vs Implicit

* Type Function

Name = "Bro"

age = 21

GPA = 1.9

student = True

Print(type(name))

Print(type(age))

Print(type(gpa))

Print(type(student))

// <class 'str'>

// <class 'int'>

// <class 'float'>

// <class 'bool'>

* EXPLICIT

age = float(age)

Print(age) // 21.0

GPA = int(GPA)

Print(GPA) // 1

student = str(student)

Print(student) // True

age = bool(age)

Print(age) // True

age = 0

age = bool(age)

Print(age) // False

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as well as to

also (gg)
true false

name = "Bro"
name = bool(name)
print(name) // True

name = ""
name = bool(name)
print(name) // False

* Implicit

x = 2
y = 2.0
x = x/y
print(x) // 1.0

* User Input

name = input("Enter your name: ")

print(f"Hello {name}")

age = int(input("Enter your age: "))

age = int(age)
age = age + 1
print(age) // 22

age = int(input("Your age: "))
age = age + 1
print(age) // 22

Total = Price * Quantity

printf "Your total is: \$[round(total, 2)]"
 ↪ print

* arithmetic operators

$$x += 1$$

$$= \boxed{x = x + 1}$$

$$x -= 2$$

$$= \boxed{x = x - 2}$$

$$x *= 3$$

$$= \boxed{x = x * 3}$$

$$x /= 2$$

$$= \boxed{x = x / 2}$$

$$x **= 2 \Rightarrow x = x^2$$

$$= \boxed{x = x * x}$$

$$x = y \% 2 \xrightarrow{\text{ans is } 0} \text{even or odd}$$

built-in Function

$x = 3.14$

result = round(x)

print(result) // 3

$y = -4$

result = abs(y)

print(result) // 4

result = pow(4, 3)

print(result)

result = max(x, y, z)

result = min(x, y, z)

* Math Module

→ import math

print(math.pi) ^{small}

print(math.e)

$x = 9$

result = math.sqrt(x)

print(result) // 3.0

$x = 9.1$

result = math.ceil(x) → round up

print(result) // 10

$x = 9.9$

result = math.floor(x) → round down

print(result) // 9

*if statements

if → Do some code only if some condition
is true

Else do something else

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

* else statement

```
if age >= 18:
```

```
    print("You are now signed up!")
```

```
else:
```

```
    print("You must be 18+ to sign up")
```

* elif statement

```
if age >= 18:
```

```
    print("Signed up")
```

```
elif age < 0:
```

```
    print("Not born yet")
```

```
else:
```

```
    print("You must be 18+")
```

```
if age >= 18
```

```
    print("OK")
```

```
elif age < 0
```

```
    print("No")
```

```
elif age >= 100
```

```
    print("No")
```

```
if age >= 100
```

```
    print("No")
```

```
if age >= 18
```

```
    print("OK")
```

IF statements

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Exercise 1

```
response = input("Would you like food? (y/n): ")
```

```
if response == "y":
```

```
    print("Have some food!")
```

```
else:
```

```
    print("No food for you!")
```

Exercise 2

```
name = input("Enter your name: ")
```

```
if name == "":
```

```
    print("You don't type in your name")
```

```
else:
```

```
    print(f"Hello {name}")
```

* booleans

```
for_sale = True
```

```
if for_sale:
```

```
    print("This item is for sale")
```

```
else:
```

```
    print("This item is not for sale")
```

Python calculator program

To

```
operator = print("Enter an operator (+ - * /): ")
num1 = float(input("Enter the 1st number: "))
num2 = float(input("Enter the 2nd number: "))

if operator == "+":
    result = num1 + num2
    print(round(result, 3))
elif operator == "-":
    result = num1 - num2
    print(round(result, 3))
elif operator == "*":
    result = num1 * num2
    print(round(result, 3))
elif operator == "/":
    result = num1 / num2
    print(round(result, 3))
else:
    print(f"Operator {operator} is not a valid")
```

python weight converter

Weight = float(input("Enter your weight"))
 unit = input("Kilograms or Pounds? (K or L): ")

if unit == "K":

weight = Weight * 2.205

unit = "Lbs."

elif unit == "L":

weight = Weight / 2.205

unit = "kgs."

else:

print(f"[unit] was not valid")

print(f"Your weight is: {weight round(Weight, 1)} {unit}")

also do log in on line
 once

Python Temperature Conversion

```
unit = input("Is this (C/F) : ")
```

```
temp = float(input("Enter the temp : "))
```

```
If unit == "C":
```

```
temp = round((9 * temp) / 5 + 32, 1)
```

```
Print(f"The Temperature in Fahrenheit is: {temp}°F")
```

```
If unit == "F":
```

```
temp = round((temp - 32) * 5 / 9, 1)
```

```
Print(f"The Temperature in Celsius is: {temp}°C")
```

```
else:
```

```
Print(f"The [unit] is not valid")
```

logical operators = used on conditional statements
 uses & and = checks TWO or more conditions if true
 uses |; or = checks if at least one condition is true
 not = true if condition is false, and vice versa

temp = 40

```
if temp > 0 and temp < 30:  

    print ("The Temperature is good")  

else:  

    print ("The Temperature is bad")
```

```
if temp <= 0 or temp >= 30:  

    print ("The Temp is bad")  

else:  

    print ("The Temp is good")
```

sunny = true

```
if sunny:  

    print ("It's sunny")  

else:  

    print ("It's cloudy")
```

sunny = False

if not sunny:
 print("It's cloudy") → الله ينفع
else:
 print("it's sunny")

*String methods

name = input("Enter your full name: ")

result = len(name) → How many characters

print(result) // Rabha Gharib → // 12 فقط 12
وأعو

result = name.find(" ") → يُرجع المكان الذي يقع فيه
print(result) // 5 هذا المكان

index → zero نبدأ

len → 1 نبدأ

name.find("a") يُخْرِج أول جاًء في الكلمة

// 1 من لوكان هنا آخر فهو 0

reverse

result = name.rfind("a") → // Rabha

print(result) → // 4 هذا المكان هو 4

-1 لو سألي ما هي المرة التي وجدت فيها

هي

الأخير

String methods

```
name = name.capitalize() // rabha gharib
print(name) // Rabha gharib
    ↪ isdigit
```

```
name = name.upper() // Rabha gharib
print(name) // RABHA GHARIB
```

```
name = name.lower() // RABHA
print(name) // Rabha
```

```
result = name.isdigit() // rabha ↪ rab123 a123
print(result) // False ↪ // False (// true)
```

```
result = name.isalpha() // rabha gharib ↪ // rabha gharib, rabb
print(result) // False ↪ // True ↪ // False
```

```
phone_number = print("Enter your number")
```

```
result = phone_number.count("-") // 1-234-567-8901
print(result) // 3
```

```
result = phone_number.replace("-", "") // 1-234-567-8901
print(result) // 1 234 567 8901
```

print(help(str)) →社会各界 FUNC def

exercise

username is no more than 12 characters

username must not contain spaces

username must not contain digits

Username = ~~input~~ ("Enter your name")
Input

if Len(username) > 12 :

 Print("Your username can't be more 12 char")

elif not username.Find(" ") == -1 :

 Print("Can't contain spaces")

elif not username.isalpha() :

 Print("Can't contain numbers")

else :

 Print(F"Welcome {username}")

indexing = accessing elements of a sequence using [] (infix operator)
[start: end : step]

Credit-number = "1234-5678-9012-3456"

Print(Credit-number[0]) → 11

Print(Credit-number[0:4]) // 1234

Print(Credit-number[5:9]) // 5678

Print(Credit-number[5:]) // 5678-9012-3456

Print(Credit-number[-1]) // 6

-2 // 5

Print(Credit-number[:12]) // 123-5891-46

exercises: last 4 digits ~~XXXX~~

creditnumber = "1234 - 5678 - 9012 - 3456"

last_digits = credit_number[-4:]

print(F"XXX - XXXX - XXXX - [last_digits]"")

reverse a string

credit_number = credit_number[::-1]

print(credit_number) // 6543 - 2109 - 8765 - 4321

* Python email slicer exercise

email = input("Enter your email: ")

index = email.index("@") → مسج

username = email[:index]

domain = email[index:]

print(f"Your username is {username}")

print(f"Your domain is {domain}")

Value

Format Specifiers = {^b: Flags} Format a value based on what flags are inserted

- (number)f = round to that many decimal places (Fixed Point)
- (number) = allocate that many spaces
- :03 = allocate and zero pad that many spaces
- :< = Left justify
- :> = right justify
- :^ = center align
- :+ = use a plus sign to indicate positive value
- : = place sign to leftmost position
- : = insert a space before positive numbers
- , = Comma separator

$$x = 3.14159$$

$$y = -987.65$$

$$z = 12.34$$

```
printf("First is $[x:.3f]") // $3.142
printf("Second is $[y:.3f]") // -$987.650
printf("Third is $[z:.3f]") // $12.340
```

```
printf("ans $[x:10]") // $...3.14159
```

```
printf("ans $[y:10]") // $...-987.65
```

```
printf("ans $[x:019]") // $0003.14159
```

```
printf("ans $[x:<0]") // $3.14159
```

^{good} ~~printf("ans \$[x:>10]") // \$...3.14159~~

~~with & psu~~

```
print(F"ans ${[x : '10f']}") // $3.14159
```

```
print(F"ans ${[x : '+'}") // $+3.14159
```

```
print(F"ans ${[x : 'g']}") // $3.14159
```

$$x = 3000.14159$$

```
print(F"ans ${[x :, 'g']}") // $3,000.14159
```

```
print(F"ans ${[x : + , .2f]}") // $+3,000.14
```

*~~while loop~~ = execute some code while some condition remains true

~~name = x~~

~~while name = =~~

name = input("Enter your name: ")

while name == "":

~~print("Enter print("you didn't enter your name"))~~

name = input("Enter your name")

```
Print(f"Hello {name}")
```

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

while age < 0:

~~print("Age can't be negative")~~

age = int(input("Enter your age"))

```
Print(f"You are {age} years old")
```

```

Food = input("Enter a food you like [q to quit]: ")
while not Food == "q":
    print(f" You like {Food}")
    Food = int(input("Enter another Food [q to quit]"))
print bye

```

Python Compound Interest Calculator

$$A = P \left(1 + \frac{r}{n}\right)^t$$

A = Final amount

P = Initial Principal balance

r = interest rate

t = number of Time Periods elasay

$$P = 0$$

$$r = 0$$

$$t = 0$$

while P <= 0:

 Principle = float(input("Enter the P: "))

 if Principle <= 0

 Print("P Can't be less or equal to zero")

 tir \downarrow

$$\text{total} = P * \text{pow}((1 + r / 100), \text{time})$$

Print(total)

For loops

For loops = execute a block of code a fixed number of times
you can iterate over a range, string, sequence, etc

For x in range(1, 11):
 print(x) //

1
2
3
4
5
6
7
8
9
10

For x in reversed(range(1, 11)):
 print(x) //

10
9
8
7
6
5
4
3
2
1

For x in range(1, 11, 2):

print(x) //

3
5
7
9

For x in range(1, 11):

if x == 5

continue

else:

print(x)

break //

1
2
3
4
5
6
7
8
9
10

nested loop

nested loop = A loop within another loop (outer, inner)

outer loop:

inner loop:

For x in range(1, 10):

```
print(x, end = " ") // 1 2 3 4 5 6 7 8 9
```

For x in range(3):

For y in range(1, 10):

```
print(y, end = "") // 123456789
```

print()

123456789

الدورة ٩ جواد وبريز

123456789

1 2 3 4 5 6 7 8 9

* Countdown timer program in Python

import time

time.sleep(3) ^{1 sec}

print("Time's up!")

my_time = int(input("Enter time in sec:"))

for x in range(0, my_time): reverse(my_time, 0, -1)

print(x) → seconds = x / 60

time.sleep(1) print(f"00:00:{seconds}")

print("Times up!")

Minutes = int(X / 60) * 60

hours = int(X / 3600)

Python Credit Card

23

1234-5678-9012-3456

remove -, sum - Add all odd places ←, double
every second digit ←, if the result is two digit
number Add them, sameven-digits
sum even + sum odd = sum % 10 == 0 ✓

sum - odd-digits = 0

sum - even-digits = 0

Total = 0

Card-number = input("Enter a credit card #: ")

Card-number = Card-number.replace("-", "")

Card-number = Card-number.replace(" ", "")

Card-number = Card-number[:: -1]

FOR X in Card-number [:: 2]:

sum - odd-digits += int(X)

FOR X in Card-number [1: :: 2]

X = int(X) * 2

if X >= 10:

sum - even-digits += ((X // 10) + 1)

else:

sum - even-digits += X

Total = sum - odd - digits + sum - even - digits

if Total % 10 == 0:

print("Valid")

else

print("Invalid")