IHF: CODE

PYTHON – SESSION 1

WHAT IS PROGRAMMING?

WHAT IS PYTHON?

WHAT'S IT USED FOR?

WHO USES IT?

RACING WITH PYTHON

HELLO, WORLD!

HELLO, WORLD! – EXAMPLE

```
print("Hello, World!")
```

NAMING PYTHON FILES

NAMING PYTHON FILES

```
<what_the_script_does>.py
```

NAMING PYTHON FILES

```
hello_world.py
number_guess.py
tic_tac_toe.py
calculate_totals.py
send_emails.py
```

RUNNING A PYTHON SCRIPT

RUNNING A PYTHON SCRIPT

```
$ python <name_of_file>.py

$ python hello_world.py
```

RUNNING A PYTHON SCRIPT

```
$ python <name_of_file>.py

$ python hello_world.py
```

RUNNING A PYTHON SCRIPT

```
$ python hello_world.py
Hello, World!
$
```

RUNNING A PYTHON SCRIPT

```
$ python hello_world.py
Hello, World!
$
```

TEXT EDITOR

HELLO, WORLD!

CODE:

```
print("Hello, <your name here>")
```

TO RUN:

```
$ python <file_name>.py
```

VARIABLES

VARIABLES

```
<variable_name> = <value>
```

VARIABLES

```
name = "Charlie"
age = 27
left_to_pay = 29.99
has_paid = False
```

VARIABLES

- Any mix of letters, numbers and some special characters
  - Must start with a letter
  - Keep lowercase
  - Use underscore where there are spaces

DATA TYPES

STRINGS

STRINGS

```
name = "Alice"
address = "123 Station Road"
favourite_food = "Pizza"
```

ESCAPING

ESCAPING

```
\" = Double Quote
\n = New line
\t = Tab
```

ESCAPING

```
favourite_food = "Pizza from \"Dough N' Sauce\""
shopping_list = "Apples\nBread\nMilk\nEggs"
```

CODING TIME

SECTION A

INTEGER

INTEGER

```
age = 17
days_in_january = 31
bottles_sitting_on_the_wall = 99
```

FLOAT

FLOAT

```
price = 12.99
percent = 34.57
pi = 3.1415
```

BOOLEAN

BOOLEAN

```
has_paid = True
vip = False
```

NONE

NONE

```
last_film_seen = None
items_in_basket = None
```

NUMERICAL OPERATORS

NUMERICAL OPERATORS

OPERATOR	ACTION	EXAMPLE
+	Addition	1 + 2
-	Subtraction	3 - 1
*	Multiplication	3 * 7
/	Division	9 / 3
**	Exponent	4 ** 2
%	Modulus (remainer)	10 % 3

NUMERICAL OPERATORS

```
print(1 + 2)
print(5 - 3)
print(3 * 7)
print(49 / 7)
print(4 ** 2)
print(10 % 3)
```

NUMERICAL OPERATORS

```
x = 3
y = 6
area = x * y
```

NUMERICAL OPERATORS

```
x = 3
y = 6
area = x * y
```

CONCATENATION

CONCATENATION

```
first_name = "Bob"
last_name = "Jones"
full_name = first_name + " " + last_name

print("Hello " + first_name)
print("Good morning, " + full_name)
```

CONCATENATION

```
first_name = "Bob"
last_name = "Jones"
full_name = first_name + " " + last_name

print("Hello " + first_name)
print("Good morning, " + full_name)
```

CONCATENATION

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first_name = "Bob"
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print("Good morning, " + full_name)
```

CONCATENATION

```
first_name = "Bob"
last_name = "Jones"
full_name = first_name + " " + last_name

print("Hello " + first_name)
print("Good morning, " + full_name)
```

ORDER OF OPERATIONS

ORDER OF OPERATIONS

Highest	()	Brackets
	**	Exponent
	*	Multiplication
	/	Division
	+	Addition
Lowest	-	Subtraction

ORDER OF OPERATIONS

```
sum = 4 + 5 * 2

correct_sum = (4 + 5) * 2
```

ORDER OF OPERATIONS

```
sum = 4 + 5 * 2

correct_sum = (4 + 5) * 2
```

CODING TIME

SECTION B

COMMENTS

COMMENTS

```
# The total including VAT
total = sub_total + vat

has_paid = False # If the user has paid or not
```

COMMENTS

```
# The total including VAT
total = sub_total + vat

has_paid = False # If the user has paid or not
```

CASTING

CASTING – INTEGERS

```
x = int(1)    # x will be 1
y = int(2.6) # y will be 2
z = int("3") # z will be 3
```

CASTING – FLOATS

```
w = float(4)       # w will be 4.0
x = float(5.6)     # x will be 5.6
y = float("6")     # y will be 6.0
z = float("7.3") # z will be 7.3
```

CASTING – STRINGS

```
x = str("abc8") # x will be 'abc8'
y = str(9)      # y will be '9'
z = str(10.0)   # z will be '10.0'
```

LENGTH

LENGTH

```
name = "Alice"
name_length = len(name) # 5

sentence_length = len("Hello, World!") #13
```

LENGTH

```
name = "Alice"
name_length = len(name) # 5

sentence_length = len("Hello, World!") #13
```

INDEX

INDEX

H	E	L	L	O
0	1	2	3	4

INDEX

C	H	A	R	L	I	E
0	1	2	3	4	5	6

```
name = "CHARLIE"
print(name[0]) # Prints 'C'
print(name[1]) # Prints 'H'
```

INPUT

INPUT

```
name = input("What's your name? ")
print("Hello " + name)

age = int(input("How old are you? "))
age_in_10_years = age + 10
print("In 10 years you will be " + str(age_in_10_years))
```

INPUT

```
name = input("What's your name? ")
print("Hello " + name)

age = int(input("How old are you? "))
age_in_10_years = age + 10
print("In 10 years you will be " + str(age_in_10_years))
```

UPPER/LOWER

UPPER/LOWER

```
name = "Alice"
print(name.upper()) # ALICE

print("HeLlO".lower()) # hello
```

UPPER/LOWER

```
name = "Alice"
print(name.upper()) # ALICE

print("HeLlO".lower()) # hello
```

CODING TIME

SECTION C

CONDITIONALS

IF

IF

```
if True:
    print("This is always shown")

if False:
    print("This is never shown")
```

IF

```
if <expression>:
    # Will only be run if the expression is True
    <code>
```

COMPARATORS

COMPARATOR	DESCRIPTION	EXAMPLE
==	Equals	"Alice" == "Alice"
!=	Does not equal	"Bob" != "Charlie"
<	Less than	4 < 10
>	Greater than	12 > 8
<=	Less than or equal to	7 <= 7
>=	Greater than or equal to	8 >= 5

COMPARATORS

```
name = "Alice"
if name == "Alice":
    print("Hello Alice")

if name != "Charlie":
    print("You are not Charlie")

age = 24
if age >= 21:
    print("You are 21 or over")
```

COMPARATORS

```
name = "Alice"
if name == "Alice":
    print("Hello Alice")

if name != "Charlie":
    print("You are not Charlie")

age = 24
if age >= 21:
    print("You are 21 or over")
```

ELSE

ELSE

```
if 1 == 1:
    print("Yes")
else:
    print("No")
```

ELSE

```
if <expression>:
    # Will only be run if the expression is True
    <code>
else:
    # Will only be run if the expression is False
    <code>
```

ELSE

```
name = "Alice"
if name == "Alice":
    print("Hello Alice")
else:
    print("You are not Alice")

age = 24
if age >= 21:
    print("You are 21 or over")
else:
    print("You are 20 or younger")
```

ELSE

```
name = "Alice"
if name == "Alice":
    print("Hello Alice")
else:
    print("You are not Alice")

age = 24
if age >= 21:
    print("You are 21 or over")
else:
    print("You are 20 or younger")
```

CODING TIME

SECTION D

EXERCISES

Finish off any exercises you did not complete in the session

FURTHER HELP

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