Johannesburg Team Housekeeping

- Please be mindful and respectful to everyone in this supportive learning environment. Mutual respect and tolerance are fundamental values we uphold.
- There are no bad or silly questions—feel free to ask anything! You can ask Sashlin or myself questions at any time, regardless of the situation. Even if you find yourself in a dire situation—like stuck in quicksand—you're still welcome to ask us a question (though we recommend calling or shouting first!).
- A few additional reminders for onsite behavior:
    - Keep shared spaces tidy—clean up after yourself in the break areas.
    - Please mute your devices during sessions to minimize distractions.
    - Avoid making personal phone calls in common areas—use designated quiet zones if you need to step away.
- Additionally, please remember to put any dishes in the sink before 2 p.m., as Lizbeth will have already finished for the day. If you're feeling unwell, kindly inform Ingrid or myself via email.

What is a String?

❖ A string is a sequence of characters enclosed in quotes (single ' ' or double ").

❖ Strings are essentially any data made up of a sequence of letters or other characters.

❖ Strings allow us to work with text!

```python
name = "The 1975"
print(name)
```

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String Operations

❖ Strings can be added to one another. This is referred to as **concatenation**.

```python
first_name = "John"
last_name = "Doe"
full_name = first_name + " " + last_name
print(full_name)
```

Indexing Strings

Strings are basically a list of characters. An example here would be the word "Hello", which consists of the characters H+e+l+l+o.

	0	1	2	3	4	5	6
word	a	m	a	z	i	n	g
	-7	-6	-5	-4	-3	-2	-1

Slicing Strings

Slicing is a way to take a "slice" or part of a string.

	0	1	2	3	4	5	6
word	a	m	a	z	i	n	g
	-7	-6	-5	-4	-3	-2	-1

Then,

word[0 : 7]   will give   'amazing'   (the letters starting from index 0 going up till 7 − 1 *i.e.*, 6 : from indices 0 to 6, both inclusive)

word[0 : 3]   will give   'ama'   (letters from index 0 to 3 − 1 *i.e.*, 0 to 2)

word[2 : 5]   will give   'azi'   (letters from index 2 to 4 (*i.e.*, 5 − 1))

word[-7 : -3]   will give   'amaz'   (letters from indices −7, −6, −5, −4 excluding index −3)

word[-5 : -1]   will give   'azin'   (letters from indices −5, −4, −3, −2 excluding −1)

Common String Methods

Python has a number of built-in functions, or methods, that help you work with strings.

- ★ upper()
- ★ lower()
- ★ capitalize()
- ★ len()

- ★ strip()
- ★ join()
- ★ split()
- ★ replace()

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Common String Methods

```python
name = "alucard"
print(name.upper())   # Prints 'ALUCARD'
```

```python
message = "HELLO!"
print(message.lower())   # Prints 'hello!'
```

```python
greeting = "Hi John!"
print(greeting.replace("John", "Jane"))   # Prints 'Hi Jane!'
```

String Formatting

❖ You can combine strings and variables using string formatting.

```python
name = "Oasis"
age = 33
message = f"My name is {name}, and I am {age} years old."
print(message) # My name is Oasis, and I am 33 years old.
```

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Escape Characters

- Escape characters are special characters in Python that allow you to include characters in strings that are otherwise difficult to type or are part of the string syntax (like quotes).

- They are preceded by a backslash (****) to "**escape**" their normal meaning and tell Python to treat them differently.

Common Escape Characters

- ❖ **New Line (\n):**
  - ➤ Moves text to a new line.
- ❖ **Tab (\t):**
  - ➤ Adds a tab (indentation) to the text.
- ❖ **Backslash (\\):**
  - ➤ Allows inclusion of a literal backslash.
- ❖ **Single Quote (\'):**
  - ➤ Inserts a single quote inside a string enclosed in single quotes.
- ❖ **Double Quote (\"):**
  - ➤ Inserts double quotes inside a string enclosed in double quotes.

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Q & A SECTION
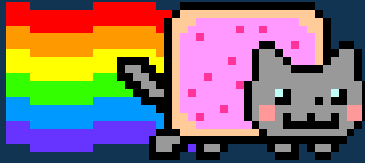
Please use this time to ask any
questions relating to the topic, should
you have any.

Let's Breathe!

Let's take a small break before moving on to the next topic.

What are Numerical Data Types

❖ In Python, numerical data types are used to store numbers. These numbers can be whole numbers (integers), decimals (floats), and even complex numbers (though we'll focus on integers and floats).

❖ Python is able to determine what data type a variable is based on the data's characteristics:

  ➤ num_one = 7 → no decimal point, no quotation marks, meaning it has to be integer.

  ➤ avg_grade = 8.3 → decimal point, no quotation marks, meaning it has to be float.

Arithmetic Operations

Similarly, with real world mathematics, we are able to apply math to our numeric variables.

"However, note that Python has a different way of interpreting the operation symbol, meaning that multiplication in Python is not written as "x". The same goes for division and exponents."

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Arithmetic Operations Example

```
addition = 6 + 2
# Result >> 8

subtraction = 6 - 2
# Result >> 4

multiplication = 9 * 3
# Result >> 27

division = 12 / 3
# Result >> 4

modulus = 9 % 3
# Result >> 0

exponential = 6 ** 2
# Result 36
```

Mathematical Methods

num = 64.235

math.floor(num)   Result : 64.0

math.ceil(num)   Result : 65.0

math.trunc(num)   Result : 64.0

math.sqrt(64)   Result : 8.0

math.pi   Result : 3.141592...

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Thank you for attending