Iteration – while loops

Software Engineering Lecture Housekeeping

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. (FBV: Mutual Respect.)

- No question is daft or silly - ask them!

- There are Q&A sessions midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.

- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Open Classes. You can submit these questions here: Open Class Questions

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Software Engineering Lecture Housekeeping cont.

- For all **non-academic questions**, please submit a query:

  www.hyperiondev.com/support

- Report a **safeguarding** incident:

  www.hyperiondev.com/safeguardreporting

- We would love your **feedback** on lectures: **Feedback on Lectures**

Progression Criteria

✓ **Criterion 1: Initial Requirements**

- Complete 15 hours of Guided Learning Hours and the first four tasks within two weeks.

✓ **Criterion 2: Mid-Course Progress**

- Software Engineering: Finish 14 tasks by week 8.
- Data Science: Finish 13 tasks by week 8.

✓ **Criterion 3: Post-Course Progress**

- Complete all mandatory tasks by 24th March 2024.
- Record an Invitation to Interview within 4 weeks of course completion, or by 30th March 2024.
- Achieve 112 GLH by 24th March 2024.

✓ **Criterion 4: Employability**

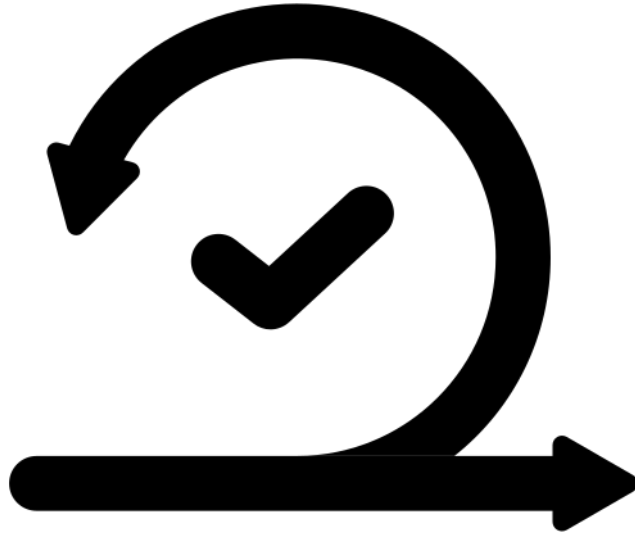- Record a Final Job Outcome within 12 weeks of graduation, or by 23rd September 2024.

Lecture Objectives

1. **Define loops as a means for automating repetitive tasks.**

2. **Implement loops to solve problems that require dynamic iteration based on changing conditions.**

3. **Recall the purpose of using a for and while loop in Python.**

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Recap on Conditionals

Iteration

For Loop

★ **For loops** are used when we need code to run a **specified number** of times.

★ Think of it making the task of creating ten print statements much easier.

```
# No need to do this

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

for Loop Syntax

```
for item in iterable_object:
    # Logic goes here
```

★ Iterable_object: a list of numbers, a string of characters, a range etc.

★ Item: temporary variable used inside the for loop to reference the current position of our iterator.

Can a while loop iterate over a String?

While Loop

★ While loops are used in situations when we are not sure how many times we need to repeat the code block.

★ Therefore, we can use a while loop to execute a certain condition. While our condition is True, the code within the loop will execute, however, the loop will terminate the moment our condition becomes False.

while Loop Example and Syntax

```python
kittens = 0
question = input("Has a kitten attempted world domination? (y/n) : ")

while question == "y":

    kittens = kittens + 1
    print(str(kittens) + " attempted world domination")

    question = input("Add another kitten? (y/n) : ")
```

Infinite Loops

★ There may be some cases where we would need the loop to keep looping for as long as the program is running.

★ This would be referred to as an infinite loop.

★ Example:

```
while True:

    print("I am an infinite loop")
    print("And no one can stop me!")
```

Breaking the Loop

★ At some point, we would like to **break** out of our infinite loop. In order to achieve that, we can use the break statement to exit the loop.

★ Example:

```python
while True:

    question = input("Do you wish to stop me? (y/n) : ")

    if question == "y":

        print("As you wish")
        break
```

Continue Example

```python
while True:

    print("I am a loop!")

    question = input("Would you like me to continue? (y/n) : ")

    if question == "y":

        print("Back to the beginning!")
        continue

    else:

        print("I shall cease")
        break
```

Challenge:

Which loop will suit this scenario best?

Wrapping Up

Iteration

Process for repeating a set of instructions.

For Loop

Important and useful for automating repetitive tasks.

While Loop

Used for situations where the number of iterations cannot be determined beforehand.

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Questions around Iteration and Loops