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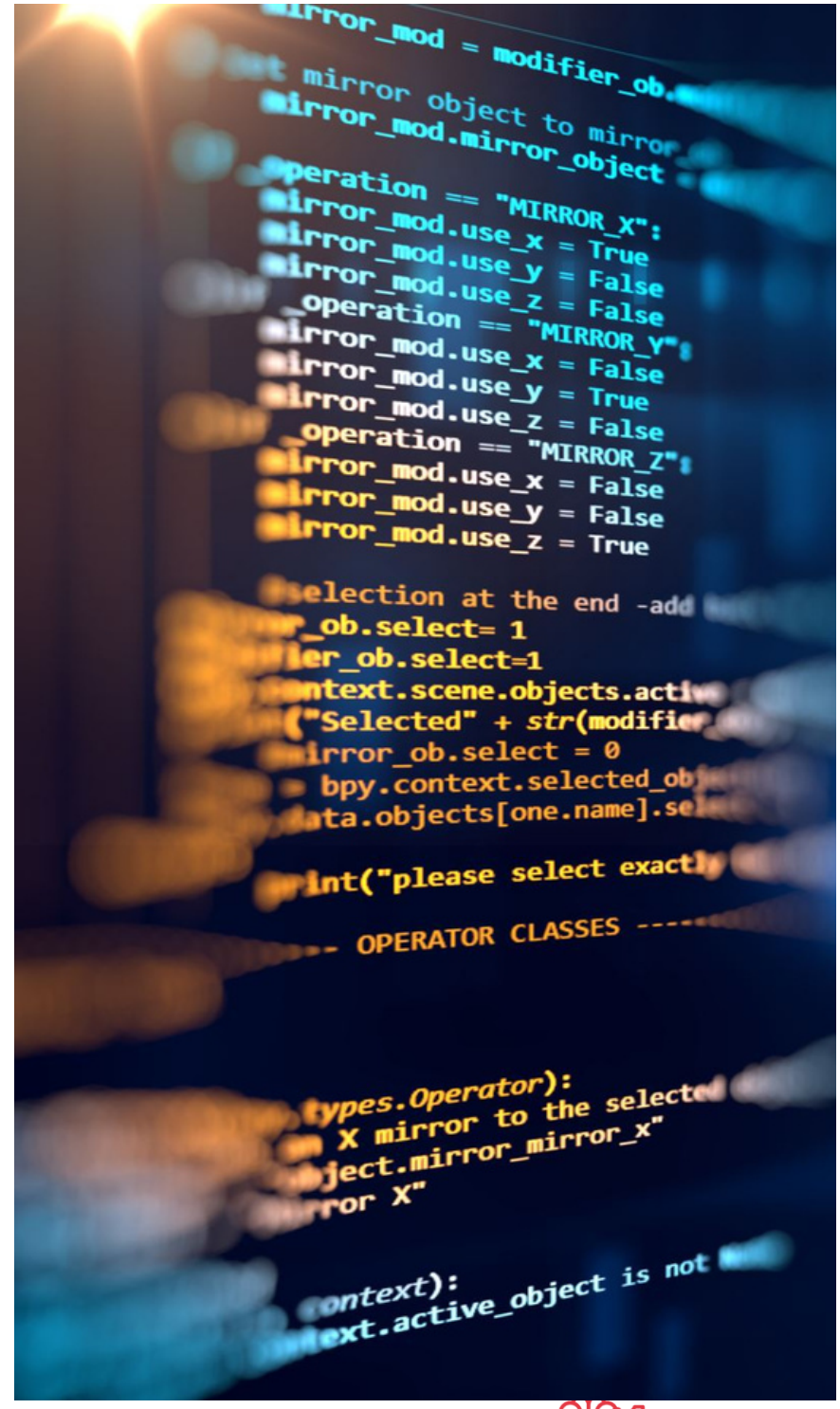
Module: Introduction to Python Control Flow Statements

NAS.IO/ARTIFICIALINTELLIGENCE

Introduction to Python Control Flow Statements

- Overview of Control Flow Statements
- Importance in Programming
- Types of Control Flow Statements



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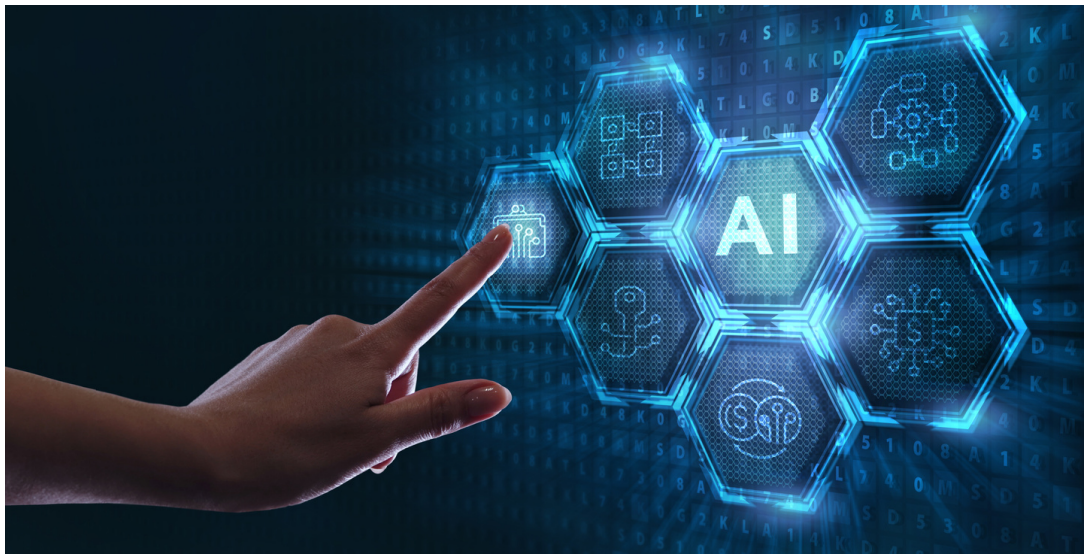
What is Control Flow?

- Control flow refers to the order in which the program’s code executes.
- It determines the branching and looping in a program.
- Essential for implementing logic.



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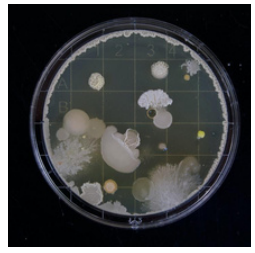
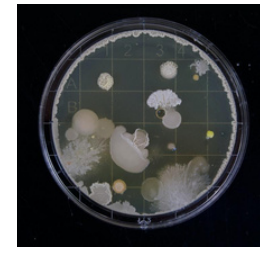
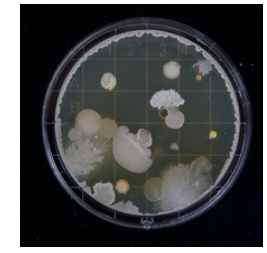
Types of Control Flow Statements



- Conditional Statements



- Looping Statements



- Jump Statements

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Conditional Statements: if

- Syntax: if condition:
- Example: if x > 0:
- Code: if x > 0: print('Positive')
- Used to execute a block of code only if the condition is true.

```python
# Check if a student is eligible for a Data Science course in the AI and Data Science Academy
student_age = 25
student_previous_experience = 2  # years of relevant experience

if student_age >= 18 and student_previous_experience >= 1:
    print("You are eligible for the Data Science course!")
```

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Conditional Statements: if-else

- Syntax: if condition: else:
- Example: if x > 0: else:
- Code: if x > 0: print('Positive') else: print('Non-Positive')
- Executes one block if true, another if false.

```
# Check if a student is eligible for a Data Science course in the AI and Data Science Academy
student_age = 25
student_previous_experience = 2  # years of relevant experience

if student_age ⩾ 18 and student_previous_experience ⩾ 1:
    print("You are eligible for the Data Science course!")
else:
    print("You are not eligible for the Data Science course at the moment.")
```

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Conditional Statements: if-elif-else

- Syntax: if condition: elif condition: else:
- Example: if x > 0: elif x == 0: else:
- Code: if x > 0: print('Positive') elif x == 0: print('Zero') else: print('Negative')
- Multiple conditions can be checked.

```python
# Check a student's eligibility for different courses in the AI and Data Science Academy
student_age = 25
student_previous_experience = 2  # years of relevant experience

if student_age ⩾ 18 and student_previous_experience ⩾ 1:
    print("You are eligible for the Data Science course!")
elif student_age ⩾ 18 and student_previous_experience < 1:
    print("You are eligible for the Intro to Data Science course.")
else:
    print("You are not eligible for any courses at the moment.")
```

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Looping Statements: for Loop

- Syntax: for variable in iterable:
- Example: for i in range(5):
- Code: for i in range(5): print(i)
- Iterates over an iterable object.

```
# List of students with their ages and years of relevant experience
students = [
    {"name": "Alice", "age": 25, "experience": 2},
    {"name": "Bob", "age": 22, "experience": 0}
]

# Iterate through the list of students and check their eligibility
for student in students:
    if student["age"] ⩾ 18 and student["experience"] ⩾ 1:
        print(f"{student['name']} is eligible for the Data Science course!")
    else:
        print(f"{student['name']} is not eligible for the Data Science course at the moment.")
```

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Looping Statements: while Loop

- Syntax: while condition:
- Example: while x > 0:
- Code: while x > 0: print(x); x -= 1
- Executes as long as the condition is true.

```
students = [
    {"name": "Alice", "age": 25, "experience": 2},
    {"name": "Bob", "age": 22, "experience": 0}
]

index = 0
while index < len(students):
    student = students[index]
    eligibility = "eligible" if student["age"] >= 18 and student["experience"] >= 1 else "not eligible"
    print(f"{student['name']} is {eligibility} for the Data Science course.")
    index += 1
```

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Jump Statements

- break: Exits the loop
- continue: Skips the current iteration
- pass: Placeholder, does nothing
- Code Examples: break in for loop, continue in while loop

```python
students = [
    {"name": "Alice", "age": 25, "experience": 2},
    {"name": "Bob", "age": 22, "experience": 0},
    {"name": "Charlie", "age": 30, "experience": 3},
    {"name": "David", "age": 19, "experience": 1},
]

for student in students:
    if student["age"] < 18:
        print(f"{student['name']} is too young for any courses.")
        continue  # Skip to the next student if age is less than 18

    if student["experience"] >= 1:
        print(f"{student['name']} is eligible for the Data Science course!")
    else:
        print(f"{student['name']} is eligible for the Intro to Data Science course.")

    # Break the loop if a student is eligible for the Data Science course
    if student["experience"] >= 1:
        print("No need to check further. Exiting the loop.")
        break
```

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Use Cases in Data Science

- Data Preprocessing
- Feature Engineering
- Model Training

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Conclusion

- Understanding control flow is crucial for effective programming.
- Widely used in Data Science tasks.
- Mastering it is essential for complex algorithms.

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- ✅ Python Projects Videos
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- ✅ Basic Python for AI/Data Jobs
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Resources

- ✅ Generative AI Resources
- ✅ Sample Datasets & Projects
- ✅ Sample Reviewed Resume
- ✅ Ready to use Resume Template
- ✅ Linkedin Profile Optimization
- ✅ Essential SQL Documents
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