

Control Structures

Control Structures:

1. Definition:

- Control structures are constructs in programming that enable you to alter the flow of program execution based on certain conditions.

2. Types of Control Structures: a. Sequential: Statements executed in a sequence from top to bottom. b. Selection:

- Conditional (if-else statements): Executes a block of code based on a condition.
- Switch statement: Allows multi-way branching based on the value of an expression. c. Iteration:
- While loop: Executes a block of code repeatedly as long as a condition is true.
- For loop: Executes a block of code a specified number of times.
- Do-While loop: Similar to a while loop but guarantees at least one execution of the block of code.

3. Importance of Control Structures:

- Enable decision-making in programs.
- Allow for repetition of code.
- Enhance code readability and maintainability.
- Improve program efficiency by controlling the flow of execution.

4. Best Practices:

- Use meaningful variable and function names.
- Keep control structures simple and concise.
- Avoid nested control structures whenever possible.
- Use comments to explain complex control flows.

5. Example:

```
num = 10
if num > 0:
    print("Number is positive")
else:
```

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```
print("Number is non-positive")
```

```
for i in range(5):  
    print(i)
```

6. Conclusion:

- Control structures are fundamental in programming as they dictate how a program behaves based on different conditions and loops. Mastering control structures is essential for writing efficient and structured code.