Programming Methodology I COEN-243 Section N NA

FIFTH TUTORIAL

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WHILE LOOPS

- **Definition of a loop?**

- While loops runs *while* the given condition is true.

- The condition should change within the loop unless you want to run the loop forever.

- Alternatively, a break statement can also be used to stop the loop

- 'continue' can be used to skip a loop iteration

- 'do…while' runs the very first iteration without checking for any conditions

NOTE: Pay attention to the code flow & values when the loop runs

FOR LOOPS

For loop – firstly initializes, then, condition check, execute body, update. (GeeksForGeeks)

- For loops have more parameters than while loops

- Parameters to be specified (usually):
  - Initialization
  - Condition
  - Update

- Alternative 'FOR loop' syntax: Range-based FOR loop, 'for(variable : collection)'

- Similar to while loops, the terms 'break' and 'continue' can be used

- **Activity:** Creating infinite 'for' and 'while' loops

- **NOTE:** Pay attention to where the variables can be accessed

Nested loops

- It is extremely important to be able to track the programs order of execution.

- Like if statements, you can also have nested loops.

  - Outer and inner loops

- After each iteration, the code inside loops run for updated data

- Thus, in each loop block you are running code for a new C++ environment

- Since it is still a C++ environment, loops, if statements, switch cases can still be added and written

- → Abstraction level

Arrays

- A collection of multiple variables pointed by a single variable

- Can be thought of as a single variable storing multiple other variables

- Declaration: *variable_type array_name[array_size]*.

- Initialization: *variable_type array_name[array_size]* = {variables separated by ','}

- Array not initialized: variables will be pointing to garbage

- An index is used to access the variables in the array

- Index starts from '0' to 'n -1' for an array of size 'n'

- Negative index also exists but will be discussed when we get to pointers

String Variable Type & Library

- A custom variable that contains a <u>collection</u> of characters specified by double quotation mark (" ")

- It can be thought of as an array of characters next to each other

- Declaration + initialization: *string* string_name = "text";

- Similar to arrays, the index can also be used to access specific characters.

- Methods and functions: https://cplusplus.com/reference/string/

References

- https://www.w3schools.com/cpp/

- https://en.cppreference.com/w/c/language/array_initialization

- https://cplusplus.com/reference/string/

- https://www.geeksforgeeks.org/cpp-loops/

- **https://github.com/TheBarzani/COEN243_Fall2022**

THANK YOU ☺