Agenda

- Limitations of C
- OOSD
- Major and minor pillars of oops.
- History of C++ and specifications
- C++ Characterstics.
- Flow of execution
- Data type and its type
- type modifiers and qualifiers
- Structure in C/C++
- access specifier
- Class implementation

Module - CPP

- 40 Marks -> Lab Exam
- 20 Marks -> Internal Exam
  - assignment evaluation + Quiz
- 40 Marks -> CCEE Exam
- Break time
- 10:00 -> 30mins
- 12:00 PM - 12:10
- 1:00 - Lunch

Installation

- compiler -> gcc/g++
- Editor -> vs code

Limitations of C

- POP(Procedure Oriented Programming) Language
- When the code size increases it becomes complex to handle/manage the entire code.
- Thier is no data security.
- Due to the pop, reusibility is limited.

OOSD (Object Oriented Software Development)

- It consists of 3 stages
- 1. OOA (Object Oriented Analysis)
- 2. OOD (Object Oriented Design)

- 3. OOP (Object Oriented Programming)

OOP (Object Oriented Programming Language)

- A. Major Pillars
  - 1. Abstraction
  - 2. Encapsulation
  - 3. Modularity
  - 4. Hireracy
- B. Minor Pillars
  - 1. Typing/polymorphism
  - 2. Persistance
  - 3. Concurrency
- Any Programming language that terms to be an oop language has to follow all the major pillars compulsary.
- Following the minor pillars is completely optional

Abstraction

- Knowing only essential/required things/information.

Encapsulation

- Binding the data and code together

Modularity

- Dividing the entire code into small modules is called as modularity

Hireracy

- Passing the properties of one entity across multiple level of generations

Typing/Polymorphism

- one entity taking multiple forms

Persistance

- language capable of Storing the data into files

Concurrency

- Having concurrent execution.

History of C++ and specifications

- It was invented by Bjarne Stroustrup in 1979.
- It was developed in AT&T Bell Lab on unix Os.
- Inintially it was called as c with classes
- In 1983 it was renamed by ANSI to CPP/C++

Specifications

- 1. 1983 - It was first edition of CPP that was released
- 2. 1989 - 2nd version was released
- 3. 1998 - C++ 98 -> Major Update of Features
- 4. 2003 - C++ 03 -> minor update
- 5. 2011 - C++ 11 -> standard library was expanded
- 6. 2014 - C++ 14
- 7. 2017 - C++ 17 -> New Features were added

Examples

- 1. Games (unreal engine)
- 2. Browsers (mozilla firefox)
- 3. OS (Apple OS)
- 4. GUI (Adobe)
- 5. Databases (mysql)

Hello World (demo01)

```
// compilation
// g++ demo01.cpp demo02 demo03

// execution
// ./a.out
```

Flow of Execution

- it consists of 4 states
  - 1. Preprocessor
  - 2. Compiler
  - 3. Linker
  - 4. Loader
- preprocessed file
  - g++ -E demo01.cpp -o demo01.i
- assembly file
  - g++ -S demo01.cpp -o demo01.o

Data type

- It defines 3 things
  - 1. Memory
    - how much memory is required to store the data
  - 2. Nature
    - what type of data can be stored inside it
  - 3. Operations
    - what type of operations we can have on that data
- Types of data types
  - 1. Fundamental Datatypes
    - void, int, float, double ,char, bool, wchar_t
  - 2. Derived Datatypes
    - Array, functions, structure, union, enum, typedef, class

bool (demo02)

- it is a datatype that stores either true or false.
- the true value is represented as 1 while the false value is represented by 0;
- Any non-zero value stored inside the bool datatype is considered as true

wchar_t (demo03)

- wide character (2 bytes to 4 bytes)
- while using wide character prefix L foe the characters that are assigned to it.
- For taking the input and displaying the output of wide character we have seperated objects called as wcin and wcout.

type modifiers

```
signed
unsigned
```

```
short
long
```

- todo -> use the type modifiers and check the size of the datatype

type qualifiers

- const
- volatile

Structure in C (demo04.c)

Structure in CPP (demo04.cpp)

- We can encapsulate all the functions that are related to the structure within the structure.
- to call these functions we will use the object of the structure.

Access Specifiers in the structure(demo05)

- 1. private
  - These members are accessiable only within the structure
- 2. public
  - These members are accessiable outside the structure on structure object
- By default the members of the structure are public.

Class

- Access Specifiers in class
  - 1. private
    - These members are accessiable only within the class
  - 2. public
    - These members are accessiable outside the class on class object
  - 3. protected
      - we will learn this at the time of inheritance
- by default members of the class are private.

Lab Work

- Installation
- C Revision
  - struct
  - pointer

    - datatypes (optional)
- class