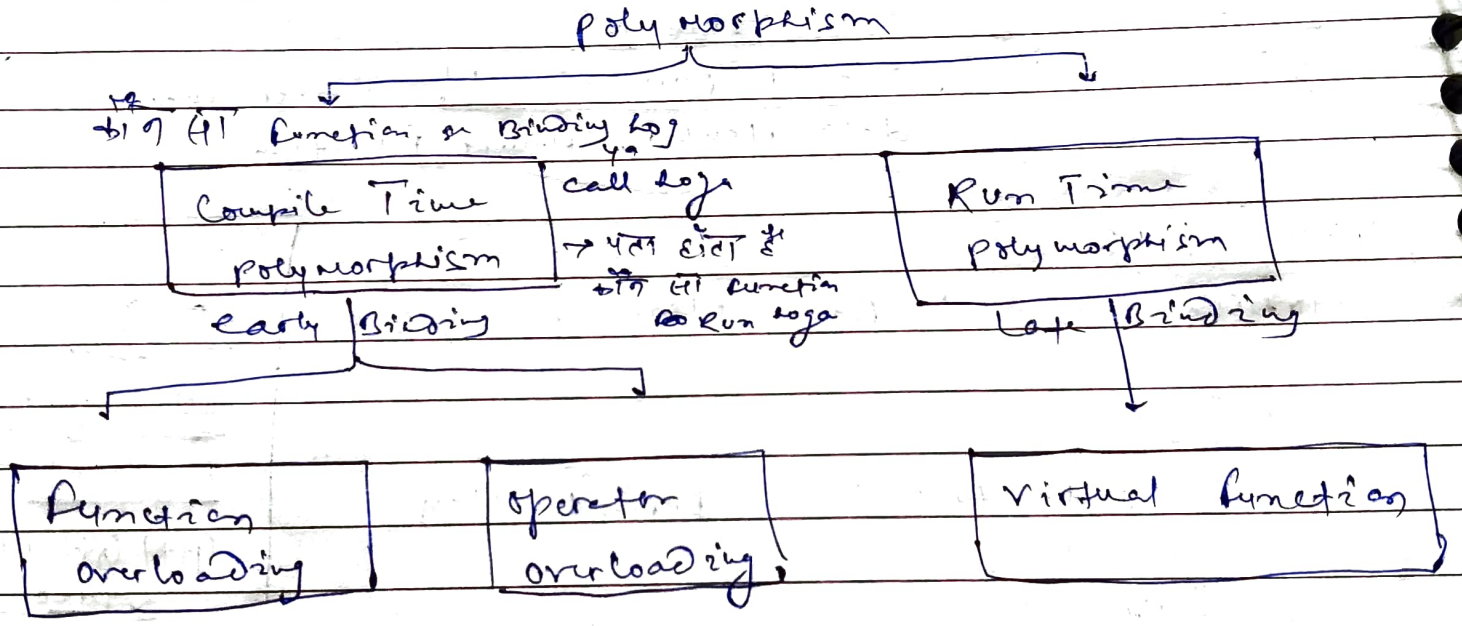
Lecture : 50
Topic : Revisiting Pointers in c++

Lecture : 51
Topic : pointers to objects

Lecture : 52
Topic : Array of objects using pointers.

Lecture : 53 :
Topic : This pointer in c++

Lecture : 54
Topic : polymorphism in c++



Lecture : 55
Topic : pointers to Derived class | important revise

Lecture : 56
Topic : Virtual function in c++

Lecture : 57
Topic : Virtual function Rules in c++

Lecture : 58

Topic : Abstract Base class and Virtual function.

Lecture : 59

Topic : Working with files in C++

Lecture : 60

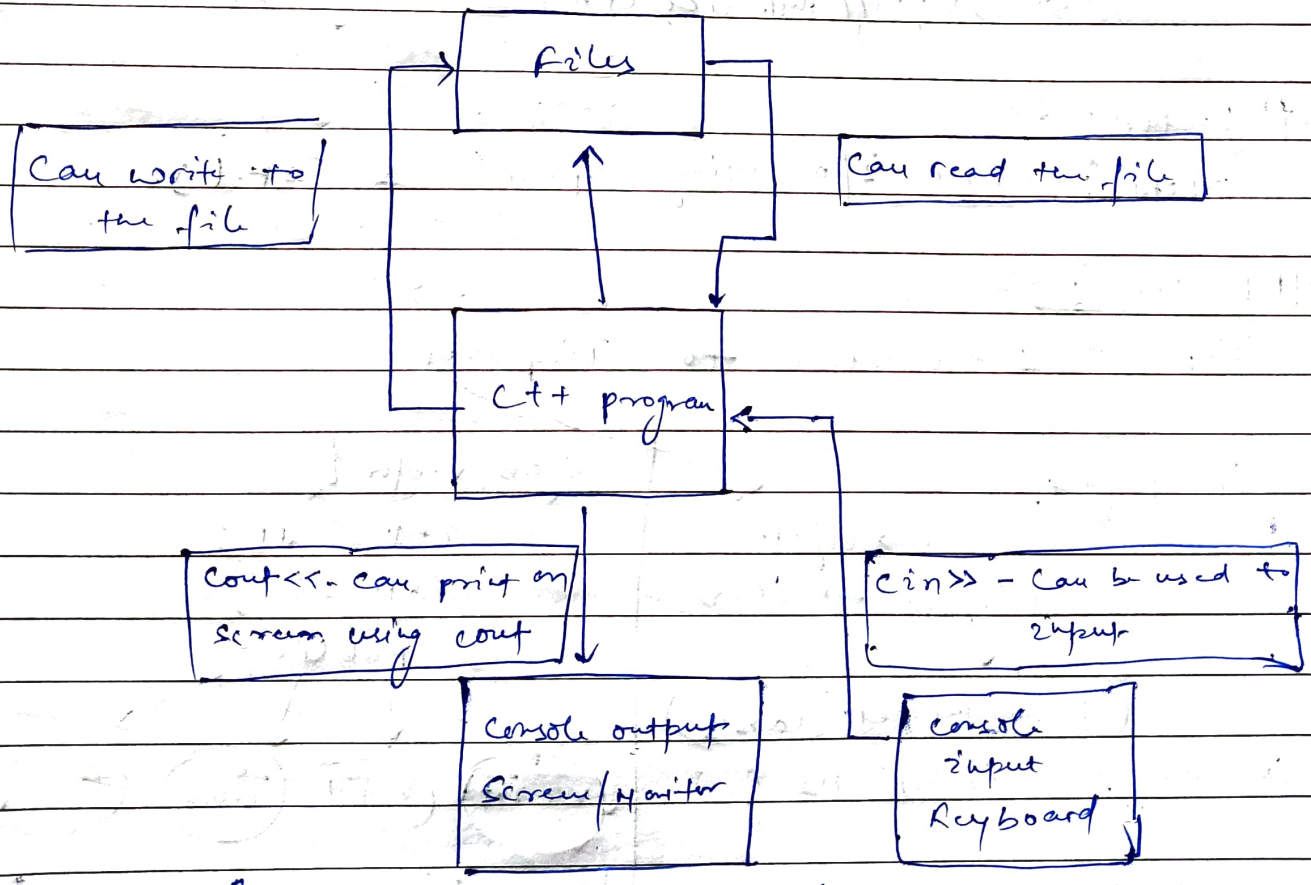
Topic : Read / write operations.

Lecture : 61

Topic : Read + write in one program.

Lecture : 59

Topic : Working with files in C++



Stream : interface for data transfer

- Input Stream
- output Stream

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Lecture : 61

Topic : Read + write in one program

C++ : File I/O [Reading & writing to a file]

* 3 useful classes

1. fstreambase
2. ifstream
3. ofstream

} <fstream>

* Read operation	* write operation
ifstream in ("this.txt");	ofstream out ("this.txt");
String st;	out << st;
in >> st; // just like cin	String st = "Quit";

Lecture : 62

Topic : file I/O using open() & EOF().

Lecture : 63

Topic : Introduction to Templates

Templates

class → object

Template → class

↓

(parameterized classes)

* Why use Templates ?

→ DRY

→ Generic programming

```
Class vector {
    int *arr;
    int size;
    public:
```

vec int | vec float | vec double | vec char

DRY : Do not Repeat Yourself.

Syntax for Templates :

T can be int, float, char etc

```
template < class T >
class vector {
    T * arr;
public:
    vector ( T *arr)
    {
    // code
    }
};
```

It represent many classes.

Template and STL

```
int main () {
    vector < int > myvec ( ptr );
    vector < float > myfvec ( ptr1 );
```

Lecture : 64
Topic : Coding Templates in c++

Lecture : 65
Topic : Multi-parameter Templates

Lecture : 66
Topic : Default data types in Templates

Lecture : 67
Topic : Function Templates in c++

Lecture : 68
Topic : Overloading function Templates.

Lecture : 69
Topic : Standard Template Library.

Introduction STL

STL : Standard Template Library.
↳ Library of Generic classes and functions

STL : Competitive programming
Limited Time

Why use STL
↳ Reuse : well tested components
↳ Time saving

HP
Area
Merg

* Components of STL

1. Containers → Store data → Use template classes
2. Algorithms → sorting, searching, use template functions
3. Iterators
   ↳ Object points to an element in a container
   ↳ Handled just like pointers
   ↳ Connects Algorithm with Containers

Lecture : 70

Topic : Types of STL Containers

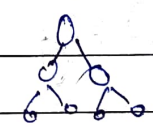
STL = Containers + Algo + Iterators

Object which stores data	Procedure to process data	Object which points to an element of a container

Container

Sequence Containers
* Linear fashion
i.e vector, list, dequeue

Associative Containers
* Direct Access
i.e Set, Multiset, Map, Multimap



Derived Containers
* Real-world Modeling
Stack, Queue, priority_queue

(iv) Resize Automatically Array

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When to use which?

(i) Sequence Containers

1) vector → Random Access → fast
insertion/Del Middle = slow
insertion at the end = fast

2) list → Random Access → slow
Del/insertion in the Middle → fast.
Del/insertion at the end → fast

(ii) Associative Containers
All operations are fast
except Random Access

(iii) Derived Container → Depends upon → Data Structure

lecture: 71
Topic: vectors in C++ STL.
Vector Manage its size

lecture: 72
Topic: Lists in C++ STL

lecture: 73
Topic: Maps in C++ STL [Sample program].

lecture: 74
Topic: functors in C++ STL.

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