DSA

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Assignment No. 10

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Aim: Implementation of sequential file.

problem statement: Department maintains students database. The file contains roll No, name, division & address. Write a program to create a sequential file to be store and maintain student data. It should allows user to:

a) Create student database.
b) Add a information of student.
c) Delete information of student.
d) Search and display info of particular student
   (i) If record is found the display it.
   (ii) If not found then display
e) Display records

Theory:

1) What is file data structure?
→ File data structure is the organization of data in secondary storage device in such a way that it minize the access time and storage space.

2) Need for file data structure
→ String a file will presence your data even if the program terminates

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Types of file

a) Data and code file

→ A data file is computer file which stores data to be used by computer application or system, including input and output data

→ It usually does not contain instructions or code to be executed

b) Variable vs fixed length file

→ Fixed length records: All records in file have same size

→ variable length record Different records in file have different sizes.

c) Text vs Binary files

→ Text files contain textual information in the form of alphabets digits and special characters.

→ Binary files contains bytes or a compiled version of text files.

d) Based of data organization

→ Sequential files: contains and stors in chronological order

→ Index sequential files: Records are stored in the order that they are written to disk

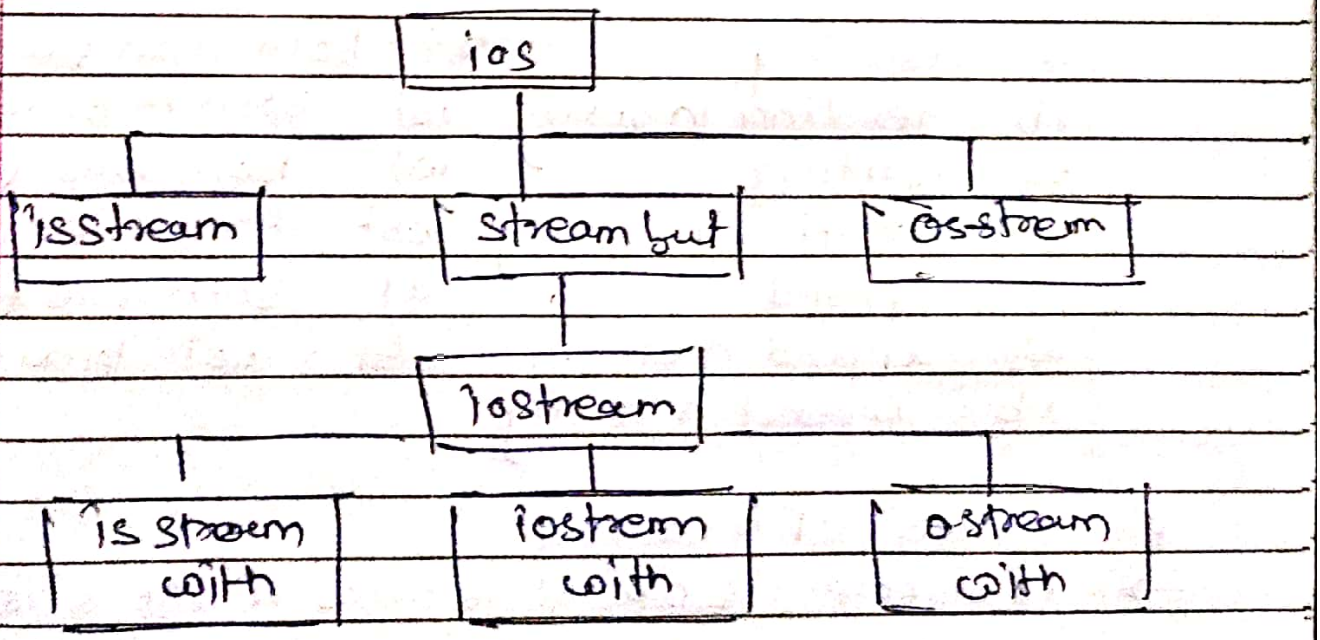
→ Direct access files: All records are stored in direct access storage device (DASD) such as hard disk, randomly throughout the file

4) file application :
Read, store, update data on file.

5) List down operations

- → create → Append
- → Delete → Seek
- → Open → Get attribute
- → Close → Set attribute
- → Read → Rename
- → Write → etc

6) Class hierarchy :



i) iostream class is the stream class hierarchy It's the base for stream ostream and streambuf
ii) istream and ostream serves the base classes for iostream class
iii) class ios is indirectly inherited to iostream class using istream and ostream

iv) The withassign classes one provided with extra functionality for the assignment operations

7) File open with modes class read, write syntaxes in c++ with examples

Openning file syntax.

ptr: fopen ("fileopen", "mode");
path

modes

r = reading	r+ = both read & write
rb = reading in binary	rb+ = both in binary
w = writing	w+ = both read & write
wb = writing in binary	wb+ = both binary mode
a = append	a+ = both read & write
ab = append in binary	ab+ = both binary append
a b = append in binary	

8) isopen, of meaning

→ ifstream::is_open returns if the stream is currently associated to file

ios::eof := returns true if the eof bit error state flag is set for the stream

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9) File pointer repositim functions - tellg, tellp

→ tellg(): used to knoed where the pointer in file
→ tellp(): get position is output sentence
→ seekg(); used to remove pointer to be desired location refrence pointer
→ seekp(); used to move the put pointer to a desired location wrt a reference point

Test cases / validation

1) Limit validation for n records
2) Input data validations for respective database of your choice
3) file open validation

Conclusion

complexity of
overwritten: O(n) Appending: O(n)
prepending: O(n+m) insertion: O(n+m)