OOP
Name- Mahesh Jagtap
Modern College of Engineering
Shivajinagar, Pune 5. Roll no: 21027

Assignment no.4

Title: File handling

Problem Statement:
Write a c++ program that creates an output file, writes information to it, closes the file & open it again as an input file & read the information from the file.

Prerequisites: object oriented programming

Objective:-
To learn the Concept of file handling.

Theory:

Files represents storage medium for storing data & information.
Streams refers to sequence of bytes. In files we store data i.e. text or binary data permanently & use these data to read or write in the form of input output operations by transferring bytes of data. So we use the term file streams/ file handling. We use the header file <fstream>

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1. Inputstream
These are used to hold input from a data producer, such as a keyboard, a file, or a network. The source stream that provides data to the program is called the input stream. A program that extracts the bytes from the inputstream In most cases the standard input device is the keyboard. with the cin & "extraction" operator (>>) it is possible to read input from the keyboard.

2. Outputstream:
These are used to hold output for a particular data consumer, such as a monitor, a file or a printer. The destination stream that receives data from the program is called the output stream.
A program inserts the bytes into an output stream. By default, the std output of a program points at the screen. so, with the cout operator & the "insertion" operator (<<) * you can print a message on the screen.

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iostream standard library provides cin & cout methods for reading from standard input & writing to standard output respectively.

file handling provides three new datatypes:

Sr. No.	Data type	Description
1.	ofstream	This data type represents the output file stream & is used to create files & to write information to files.
2.	ifstream	This data type represents the input file stream & is used to read information from files.
3.	fstream	This data type represents the file stream generally, & has the capabilities of both ofstream & ifstream which mean it can create files, write information to files, & read info from files.

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To perform file processing in C++, header files <iostream> & <fstream> must be included in your C++ source file.

Opening a file:

A file must be opened before you can read from it or write to it. Either ofstream or fstream object may be used to open a file writing. And ifstream object is used to open a file for reading purpose only.

Following is the std syntax for open() function, which is a member of fstream, ifstream & ofstream objects.

```
void open(const char *filename, ios::open-mode mode);
```

Here, the first argument specifies the name & location of the file to be opened & the second argument of the open() member function defines the mode in which the file should be opened.

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Sr. No	Mode flag	Description
1.	ios :: app	Append mode. All output to that file to be appended to the end.
2.	ios :: ate	open a file for output & move the read/write control to the end of the file.
3.	ios :: in	open a file for reading.
4.	ios :: out	open a file for writing
5.	ios :: trunc	if the file already exists, its contents will be truncated before opening the file.

You can combine two or more of these values by ORing them together. for example if you want to open a file in write mode & want to truncate it in case that already exists, following will be the syntax:

```
ofstream outfile;
outfile.open("file.dat", ios::out |
                         ios::trunc);
```

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Similar way, you can open a file for reading & writing purpose as follows:-

```
fstream afile;
afile.open("file.dat", ios::out |
                       ios::in);
```

- **closing a file.**

When a c++ program terminates it automatically flushes all the streams, release all the allocated memory & close the of all opened files.
But it is always a good practice that a programmer should close all the opened files before program termination.
following is the std syntax for close() function which is a member of fstream, ifstream, & ofstream objects.

```
void close();
```

- writing into file & closing the file

```
new_file << "learning file handling";
                    //writing to file
new_file.close();
```

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Here, we first create a new file "new_file_write" using open() function since we wanted to send output to the file so, we use ios::out.
As given in the program, information typed inside the quotes after Insertion pointer "<<" got passed to the output file.
once the work is complete, we close the file.

Reading from a file

- You read information from a file into your program using the stream extraction operator (>>) just as you use that operator to input information from the keyboard.

- The only difference is that you use an ifstream or fstream object instead of the cin object.

```
file1.read (char*) &s , sizeof(s));
```

- These functions take two arguments. The first is the adress of the variable v, & the second is the length of that variable in bytes. The address of variable must be cast to type char* (ie. pointer to character type)

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writing to a file

- while doing c++ programming, you write information to a file from your program using the stream insertion operator (<<) just as you use that operator to output information to the screen.
- The only diff. is that you can use an ofstream or fstream object instead of cout object.

```
file.write((char*) &s, sizeof(s));
```

Algorithm:

1. start
2. create class
3. define data members roll no & name.
4. Define accept() to ~~make~~ take name & roll no. from user.
5. Define display() to display the record
6. In main(),
   create the object of class & fstream class.
7. Take a limit from user in 'n' variable.
8. open the file in out mode, call accept() to take record from user, then call write() to write that record into the file & at the end close that file.

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9. open the file in 'in' mode, read the record from the file, call display() function to display the record & at the end close that file.
10. stop.

I/P:

how many records you want : 3
1. abc
2. pqr
3. XYZ

O/P:

name : abc
Roll No. 1
name : pqr
Roll No. 2
name : XYZ
Roll No. 3

Conclusion:

Do, in this assignment, we studied diff. file handling operations like, opening, closing, reading & writing and performed successfully one the files.

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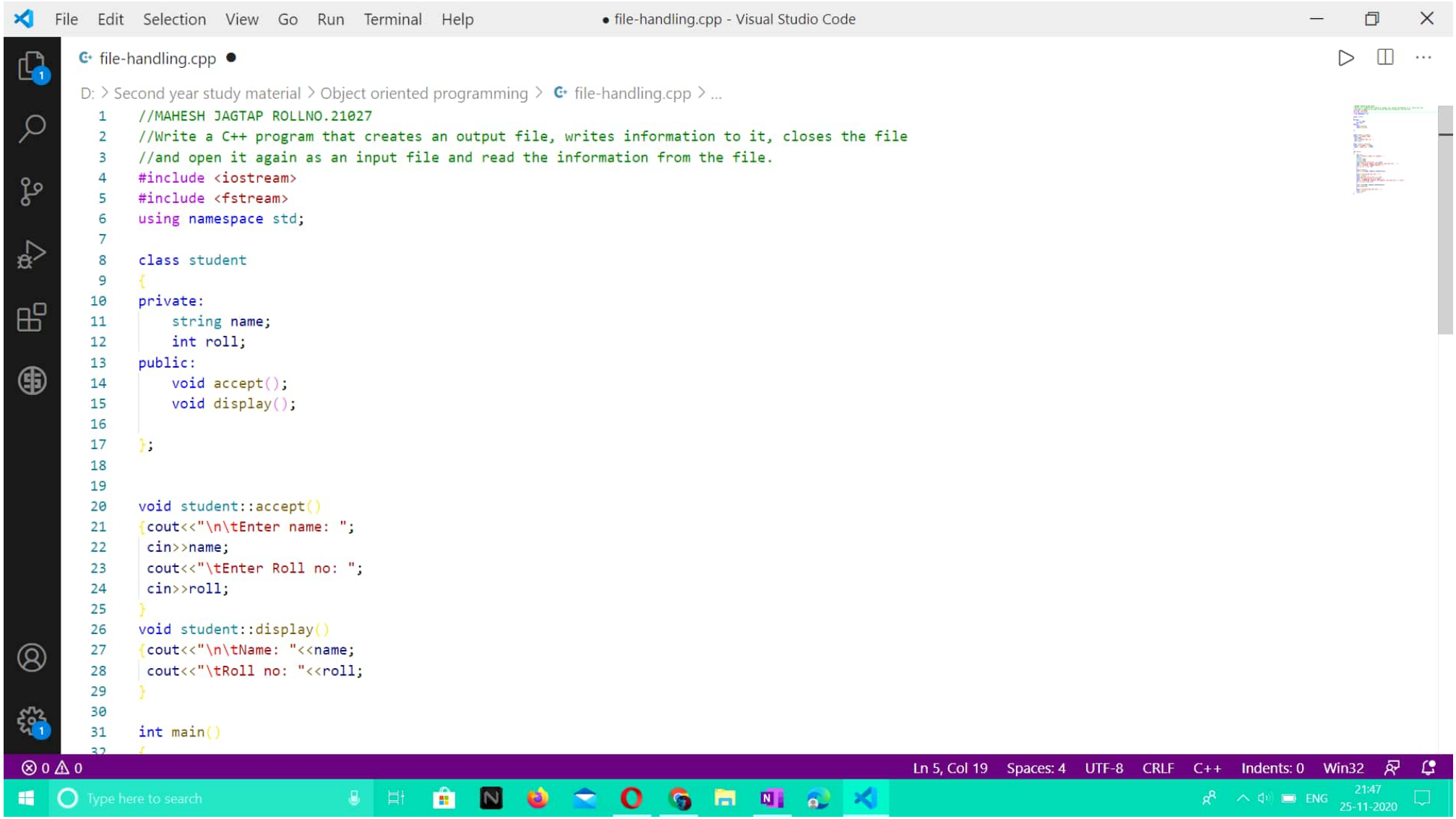

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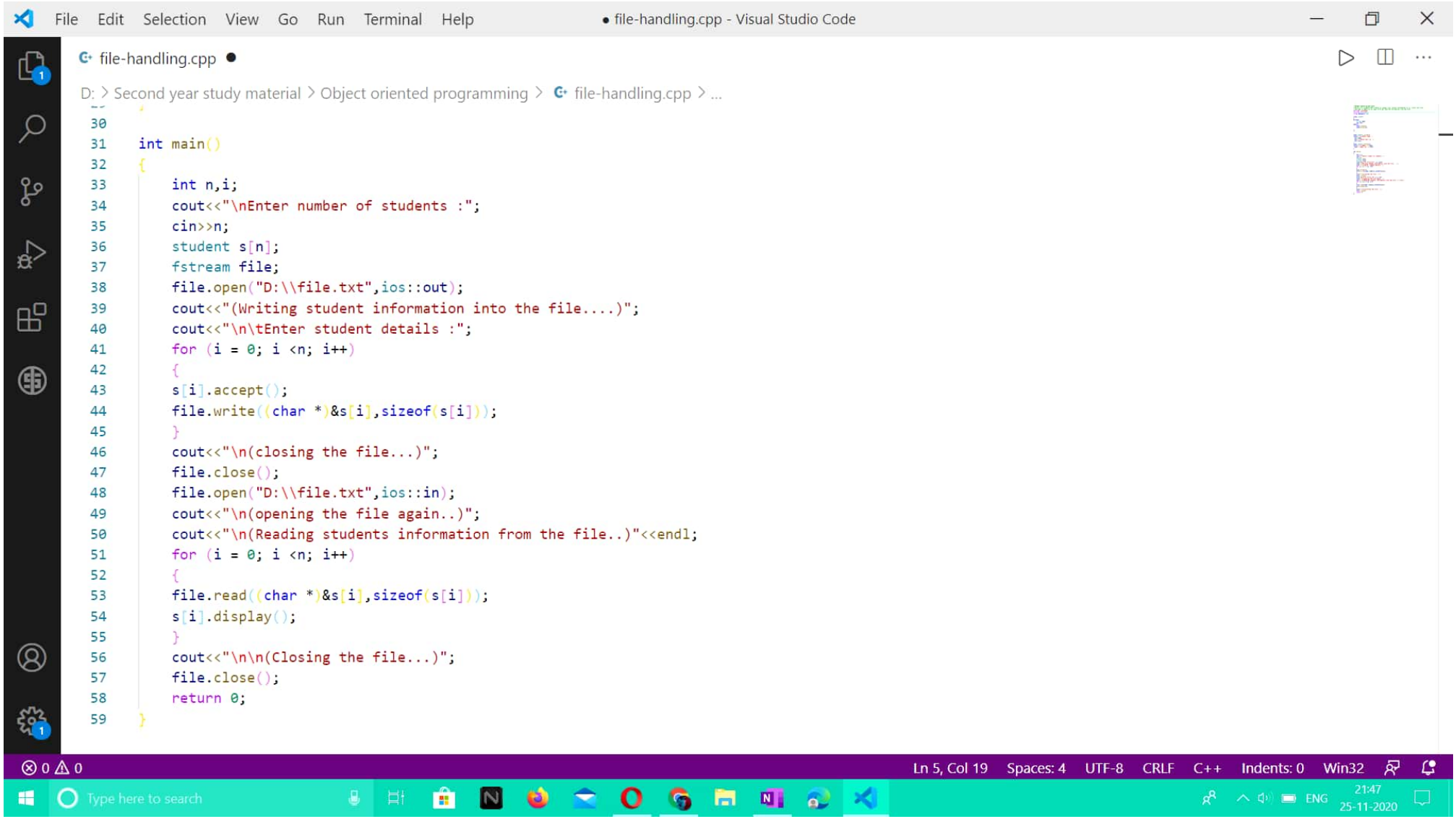

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