Ganpat University

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Computer Science & Engineering

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Sem:- ***2***

Sub: - ***ESFP-II***

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Prac:- ***9***

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Practical 9

Definition:

1. First create one login module, where you have to enter login id and password, if given id and password is correct then main program functionality should be open. On incorrect login, you have to give maximum three chance for login, otherwise program should be terminated.
2. Minimum 1 constructor method should be available in the program, rest as per your program functionality requirement. You can also create/declare user defined function as per your requirement.
3. For the solving purpose of given topic practical, you need to create minimum three classes, rest as per your given object information requirement.
4. Implement the concept of friend class for the performing purpose of the practical. Second class should be the friend class of the first class. Friend class should be declared under private access specifier in the first class.
5. Second class should have minimum one friend function, rest you can declare as per your practical program functionality requirement.
6. Third class should be the friend class of second class, and accordingly you have to perform practical.
7. You must use access specifier for data member and member function declaration in program.
8. Wherever is required to use character data member in class, instead of that use compulsorily string data member.
9. Take minimum 10 data/record from the user and display according to the choice of user category wise. (Minimum six different options should be there for displaying information, and if you want more as per program requirement you can add more choices).
10.Use all possibility filter method from stored record information.
11.After all functionality execution, you need to call destructor function.

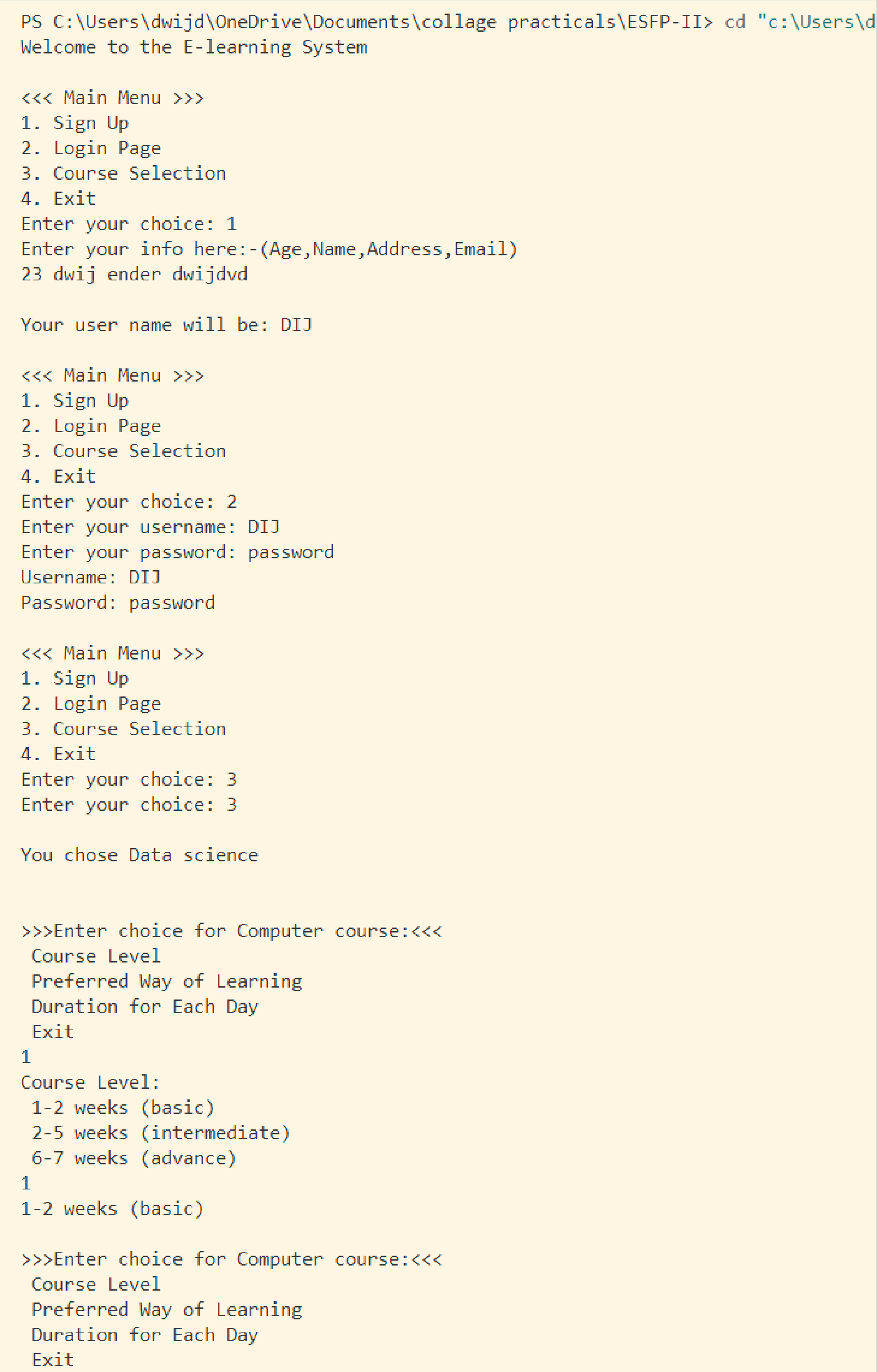
Code:-

```
#include <iostream>
#include <fstream>
#include <string>
#include <algorithm>
#include <unordered_set>

using namespace std;

// Forward declaration
class elearning;

// Friend function declaration
void storeDataToFile(elearning& obj);

class elearning
{
private:
    // choices made in course selection (for data storing in file handling)
    int expression;
    string selectedCourse;
    string courseLevel;
    string preferredWayOfLearning;
    string durationForEachDay;

    // User info
    string age;
    string name;
    string address;
    string email;
    string tinfo = "";

    // Set of valid usernames
    unordered_set<string> validUsernames = {"DIJ"};

public:
    // Default constructor
    elearning()
    {
        expression = 0; // Default value
    }

    // Parameterized constructor
    elearning(int exp) //Course choices
    {
        expression = exp;
        switch (expression)
        {
        case 1:
            cout << endl << "You chose Business" << endl << endl;
            selectedCourse = "Business";
            selectComputerCourse();
            break;
        case 2:
            cout << endl << "You chose Computer course" << endl << endl;
            selectedCourse = "Computer course";
            selectComputerCourse();
            break;
        case 3:
            cout << endl << "You chose Data science" << endl << endl;
            selectedCourse = "Data science";
            selectComputerCourse();
            break;
        case 4:
            cout << endl << "You chose ICT" << endl << endl;
            selectedCourse = "ICT";
            selectComputerCourse();
            break;

        default:
            break;
        }
    }

    void selectCourse()
    {
        cout << ">>>Course Selection<<<" << endl;
        cout << " Business" << endl;
        cout << " Computer course" << endl;
        cout << " Data science" << endl;
        cout << " ICT" << endl;
    }

    void selectComputerCourse()
    {
        int totalDuration = 0;
        int innerExpression = 0;
        while (true)
        {

            cout << endl << ">>>Enter choice for Computer course:<<<" << endl;
            cout << " Course Level" << endl;
            cout << " Preferred Way of Learning" << endl;
            cout << " Duration for Each Day" << endl;
            cout << " Exit" << endl;
```

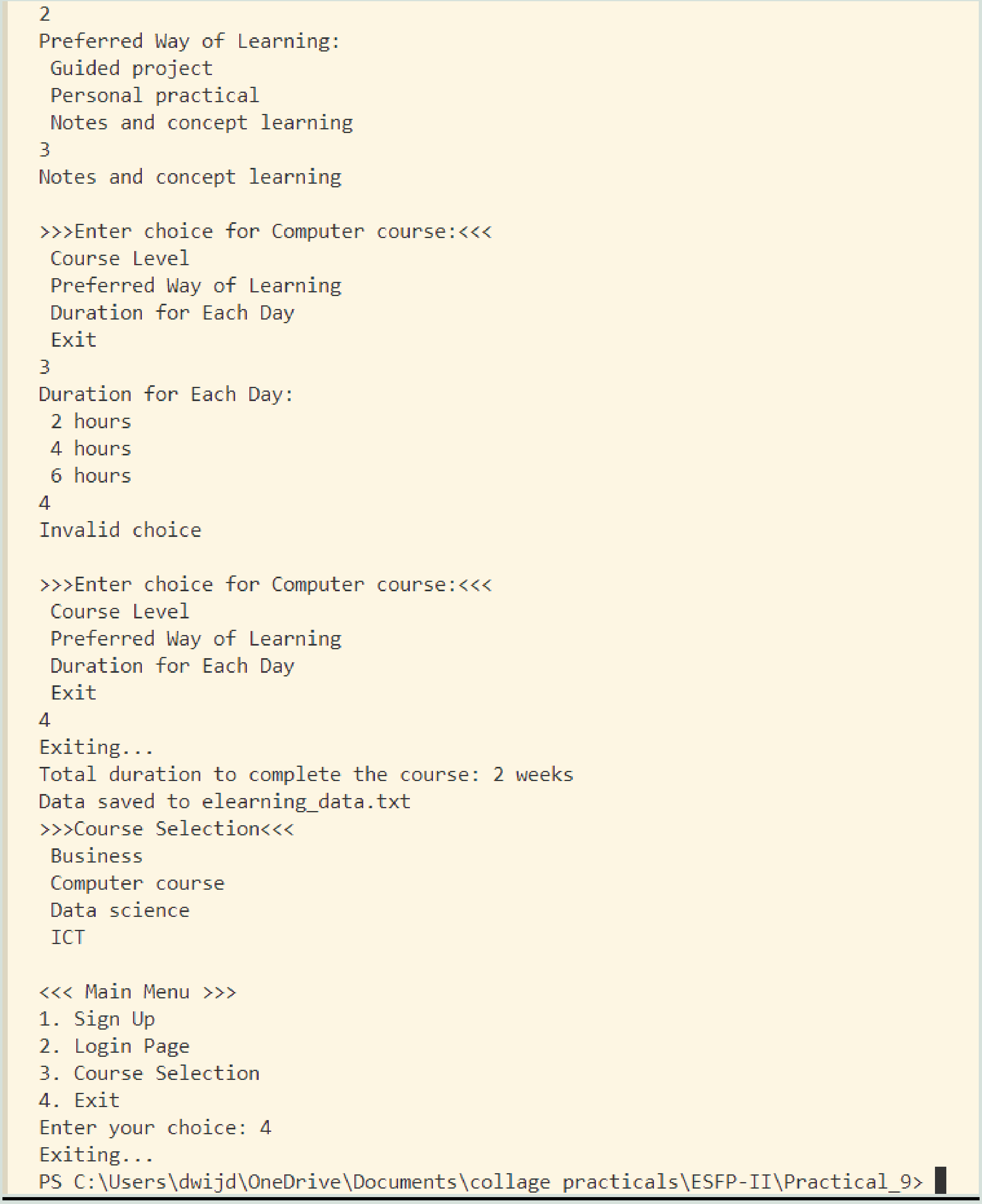
```
            cin >> innerExpression;

            switch (innerExpression)
            {
            case 1:
            {
                int level = 0;
                cout << "Course Level:" << endl;
                cout << " 1-2 weeks (basic)" << endl;
                cout << " 2-5 weeks (intermediate)" << endl;
                cout << " 6-7 weeks (advance)" << endl;
                cin >> level;
                switch (level)
                {
                case 1:
                    cout << "1-2 weeks (basic)" << endl;
                    courseLevel = "1-2 weeks (basic)";
                    totalDuration += 2; // Add 2 weeks to total duration
                    break;

                case 2:
                    cout << "2-5 weeks (intermediate)" << endl;
                    courseLevel = "2-5 weeks (intermediate)";
                    totalDuration += 5; // Add 5 weeks to total duration
                    break;

                case 3:
                    cout << "6-7 weeks (advance)" << endl;
                    courseLevel = "6-7 weeks (advance)";
                    totalDuration += 7; // Add 7 weeks to total duration
                    break;

                default:
                    cout << "Invalid choice" << endl;
                    break;
                }
                break;
            }

            case 2:
            {
                int preferredWay = 0;
                cout << "Preferred Way of Learning:" << endl;
                cout << " Guided project" << endl;
                cout << " Personal practical" << endl;
                cout << " Notes and concept learning" << endl;
                cin >> preferredWay;
                switch (preferredWay)
            {
            case 1:
                cout << "Guided project" << endl;
                preferredWayOfLearning = "Guided project";
                break;

            case 2:
                cout << "Personal practical" << endl;
                preferredWayOfLearning = "Personal practical";
                break;

            case 3:
                cout << "Notes and concept learning" << endl;
                preferredWayOfLearning = "Notes and concept learning";
                break;

            default:
                cout << "Invalid choice" << endl;
                break;
            }
            break;
        }

        case 3:
        {
            int duration = 0;
            cout << "Duration for Each Day:" << endl;
            cout << " 2 hours" << endl;
            cout << " 4 hours" << endl;
            cout << " 6 hours" << endl;
            cin >> duration;
            switch (duration)
            {
            case 1:
                cout << "2 hours" << endl;
                durationForEachDay = "2 hours";
                break;

            case 2:
                cout << "4 hours" << endl;
                durationForEachDay = "4 hours";
                break;

            case 3:
                cout << "6 hours" << endl;
                durationForEachDay = "6 hours";
                break;
                default:
                    cout << "Invalid choice" << endl;
                    break;
                }
                break;
            }

            case 4:
                cout << "Exiting..." << endl;
                cout << "Total duration to complete the course: " <<
totalDuration << " weeks" << endl;
                storeDataToFile(*this); // Call friend function with current
object
                return;

            default:
                cout << "Invalid choice" << endl;
                break;
            }
        }
    }

    // Friend function declaration
    friend void storeDataToFile(elearning& obj);

    // Friend function definition
    friend void userinfo(elearning& obj);

    friend void signpage(elearning& obj3);

    friend void loginpage(elearning& obj2);
};

void signpage(elearning& oj)
{
}

void loginpage(elearning& obj2)
{
    cout << "Enter your username: ";
    string username;
    cin >> username;

    // Convert entered username to uppercase for case-insensitive comparison
    transform(username.begin(), username.end(), username.begin(), ::toupper);

    // Check if username exists in the set of valid usernames
    if (obj2.validUsernames.find(username) == obj2.validUsernames.end())
    {
        cout << "User does not exist." << endl;
        return;
    }

    cout << "Enter your password: ";
    string password;
    cin >> password;

    // Perform authentication logic here
    // For simplicity, we will just print the username and password
    cout << "Username: " << username << endl;
    cout << "Password: " << password << endl;
}

void storeDataToFile(elearning& obj)
{

    ofstream file("elearning_data.txt", ios_base::app);
    if (!file.is_open())
    {
        cout << "Error opening file" << endl;
        return;
    }

    file << "Total user data:-\nAge  Name  Address  Email" << endl;
    file << obj.tinfo << endl
         << endl;

    file << "Course Info:" << endl;
    file << "Selected Course: " << obj.selectedCourse << endl;
    file << "Course Level: " << obj.courseLevel << endl;
    file << "Preferred Way of Learning: " << obj.preferredWayOfLearning <<
endl;
    file << "Duration for Each Day: " << obj.durationForEachDay << endl;
    file << "----------------------------------------" << endl;

    file.close();
    cout << "Data saved to elearning_data.txt" << endl;
}

void userinfo(elearning& obj) //string management (Practical_8)
{
    cout << "Enter your info here:-(Age,Name,Address,Email)" << endl;
    cin >> obj.age >> obj.name >> obj.address >> obj.email;
    cout << endl;

    // Append()
    obj.tinfo = obj.age + " " + obj.name + " " + obj.address + " " +
obj.email;

    //empty()
    if (obj.age.empty() || obj.name.empty() || obj.address.empty() ||
obj.email.empty())
    {
      cout << "Error: Data not stored\n\n";
      cout << "Enter your info again here:-(Age,Name,Address,Email)" << endl;
      userinfo(obj);
    }

    // Insert()
    string city = "City: ";
    obj.address.insert(0, city);

    // At
    char firstChar = obj.address.at(0); //to order it in alphabetical-order

    // Length
    int addressLength = obj.address.length();

    // Size
    int emailSize = obj.email.size();

    // Clear
    obj.age.clear();

    // Erase
    obj.address.erase(0, 6); // Erase "City: " from address

    // Empty
    bool isNameEmpty = obj.name.empty();
    // Sort (sorting the name in alphabetical order)
    sort(obj.name.begin(), obj.name.end());

    // To Upper
    transform(obj.name.begin(), obj.name.end(), obj.name.begin(), ::toupper);
// Convert name to uppercase

    // Substring
    string userName = obj.name.substr(0, 3); // Get first 3 characters for
username

    cout << "Your user name will be: " << userName << endl;
}

int main()
```

```
{
    //<<< This is user interface >>>
    int Uchoice;

    // Declare elearning objects outside the switch
    elearning userObj;
    elearning courseObj;
    elearning loginObj;

    cout << "Welcome to the E-learning System" << endl;

    while (true)
    {
        cout << endl << "<<< Main Menu >>>" << endl;
        cout << "1. Sign Up" << endl;
        cout << "2. Login Page" << endl;
        cout << "3. Course Selection" << endl;
        cout << "4. Exit" << endl;
        cout << "Enter your choice: ";
        cin >> Uchoice;
        cin.ignore(); // Remove newline character from buffer

        switch (Uchoice)
        {
        case 1:
            userinfo(userObj); // Call userinfo function
        break;

        case 2:
            loginpage(loginObj); // Call loginpage function
        break;

        case 3:
            int userChoice;
            cout << "Enter your choice: ";
            cin >> userChoice;
            cin.ignore(); // Remove newline character from buffer

            // Create courseObj with the user's choice
            courseObj = elearning(userChoice);
            courseObj.selectCourse(); // Call selectCourse function
        break;

        case 4:
            cout << "Exiting..." << endl;
        return 0;

        default:
            cout << "Invalid choice" << endl;
        break;
        }
    }
    return 0;
}
```

Output:-

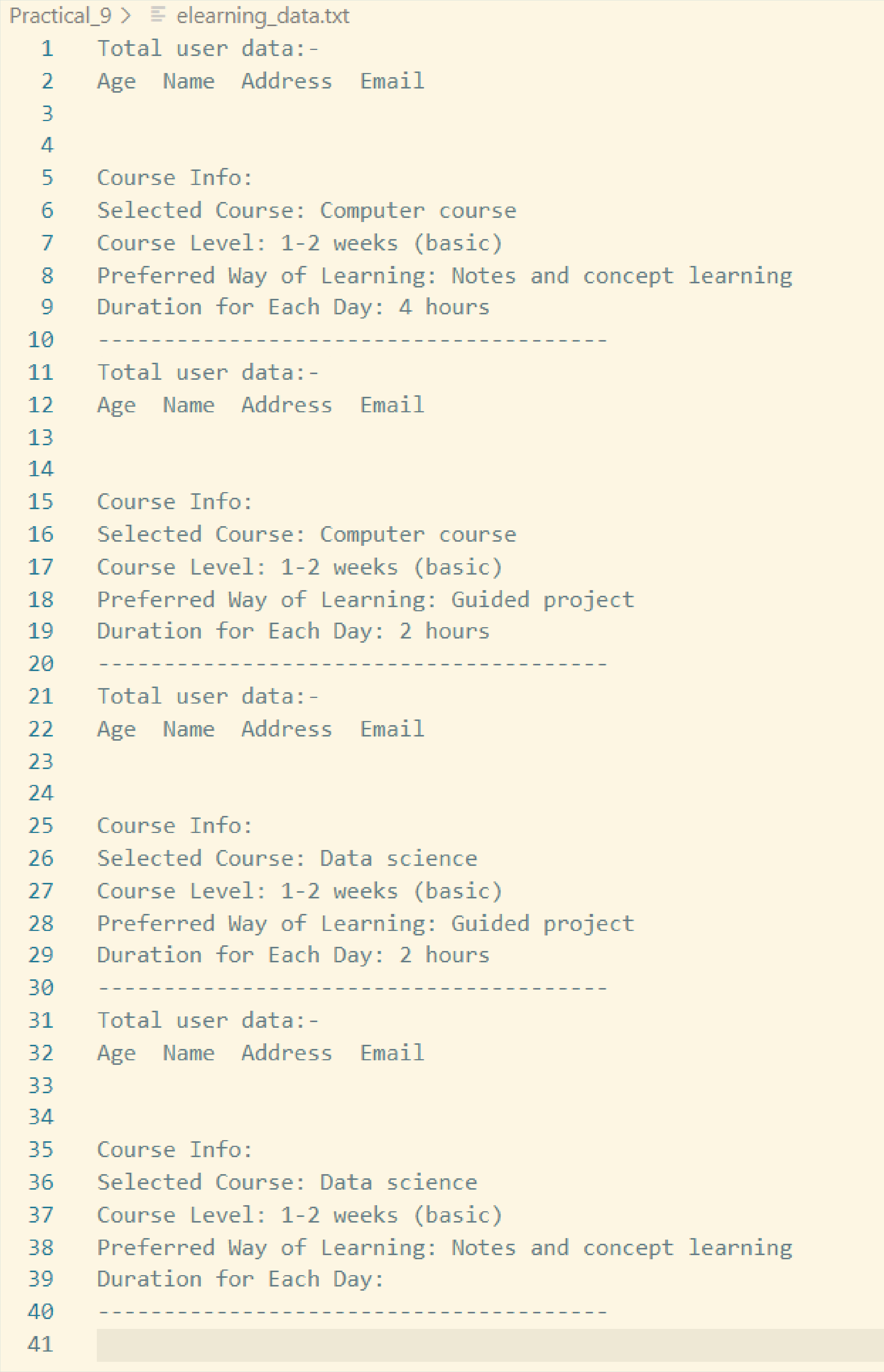


```
PS C:\Users\dwijd\OneDrive\Documents\collage practicals\ESFP-II> cd "c:\Users\d
Welcome to the E-learning System

<<< Main Menu >>>
1. Sign Up
2. Login Page
3. Course Selection
4. Exit
Enter your choice: 1
Enter your info here:-(Age,Name,Address,Email)
23 dwij ender dwijdvd

Your user name will be: DIJ

<<< Main Menu >>>
1. Sign Up
2. Login Page
3. Course Selection
4. Exit
Enter your choice: 2
Enter your username: DIJ
Enter your password: password
Username: DIJ
Password: password

<<< Main Menu >>>
1. Sign Up
2. Login Page
3. Course Selection
4. Exit
Enter your choice: 3
Enter your choice: 3

You chose Data science


>>>Enter choice for Computer course:<<<
 Course Level
 Preferred Way of Learning
 Duration for Each Day
 Exit
1
Course Level:
 1-2 weeks (basic)
 2-5 weeks (intermediate)
 6-7 weeks (advance)
1
1-2 weeks (basic)

>>>Enter choice for Computer course:<<<
 Course Level
 Preferred Way of Learning
 Duration for Each Day
 Exit
```

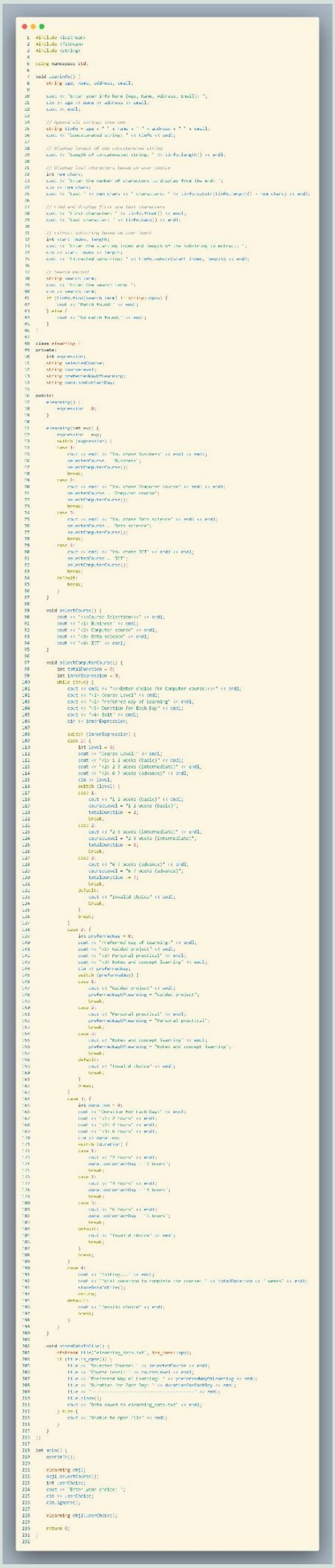


```
2
Preferred Way of Learning:
 Guided project
 Personal practical
 Notes and concept learning
3
Notes and concept learning

>>>Enter choice for Computer course:<<<
 Course Level
 Preferred Way of Learning
 Duration for Each Day
 Exit
3
Duration for Each Day:
 2 hours
 4 hours
 6 hours
4
Invalid choice

>>>Enter choice for Computer course:<<<
 Course Level
 Preferred Way of Learning
 Duration for Each Day
 Exit
4
Exiting...
Total duration to complete the course: 2 weeks
Data saved to elearning_data.txt
>>>Course Selection<<<
 Business
 Computer course
 Data science
 ICT

<<< Main Menu >>>
1. Sign Up
2. Login Page
3. Course Selection
4. Exit
Enter your choice: 4
Exiting...
PS C:\Users\dwijd\OneDrive\Documents\collage practicals\ESFP-II\Practical_9>
```

Recorded data in text file:-



```
Total user data:-
Age  Name  Address  Email


Course Info:
Selected Course: Computer course
Course Level: 1-2 weeks (basic)
Preferred Way of Learning: Notes and concept learning
Duration for Each Day: 4 hours
---------------------------------------
Total user data:-
Age  Name  Address  Email


Course Info:
Selected Course: Computer course
Course Level: 1-2 weeks (basic)
Preferred Way of Learning: Guided project
Duration for Each Day: 2 hours
---------------------------------------
Total user data:-
Age  Name  Address  Email


Course Info:
Selected Course: Data science
Course Level: 1-2 weeks (basic)
Preferred Way of Learning: Guided project
Duration for Each Day: 2 hours
---------------------------------------
Total user data:-
Age  Name  Address  Email


Course Info:
Selected Course: Data science
Course Level: 1-2 weeks (basic)
Preferred Way of Learning: Notes and concept learning
Duration for Each Day:
---------------------------------------
```



```cpp
#include <iostream>
#include <fstream>
#include <string>

using namespace std;

void userInfo() {
    string age, name, address, email;

    cout << "Enter your info here (age, Name, Address, Email): ";
    cin >> age >> name >> address >> email;
    cout << endl;

    // Append all strings into one
    string linfo = age + " " + name + " " + address + " " + email;
    cout << "Concatenated string: " << linfo << endl;

    // Display length of the concatenated string
    cout << "Length of concatenated string: " << linfo.length() << endl;

    // Display last characters based on user choice
    int num_chars;
    cout << "Enter the number of characters to display from the end: ";
    cin >> num_chars;
    cout << "Last " << num_chars << " characters: " << linfo.substr(linfo.length() - num_chars) << endl;

    // Find and display first and last characters
    cout << "First character: " << linfo.front() << endl;
    cout << "Last character: " << linfo.back() << endl;

    // Extract substring based on user input
    int start_index, length;
    cout << "Enter the starting index and length of the substring to extract: ";
    cin >> start_index >> length;
    cout << "Extracted substring: " << linfo.substr(start_index, length) << endl;

    // Search method
    string search_term;
    cout << "Enter the search term: ";
    cin >> search_term;
    if (linfo.find(search_term) != string::npos) {
        cout << "Match found!" << endl;
    } else {
        cout << "No match found." << endl;
    }
}

class elearning {
private:
    int expression;
    string selectedCourse;
    string courseLevel;
    string preferredWayOfLearning;
    string durationForEachDay;

public:
    elearning() {
        expression = 0;
    }

    elearning(int exp) {
        expression = exp;
        switch (expression) {
        case 1:
            cout << endl << "You chose Business" << endl << endl;
            selectedCourse = "Business";
            selectComputerCourse();
            break;
        case 2:
            cout << endl << "You chose Computer course" << endl << endl;
            selectedCourse = "Computer course";
            selectComputerCourse();
            break;
        case 3:
            cout << endl << "You chose Data science" << endl << endl;
            selectedCourse = "Data science";
            selectComputerCourse();
            break;
        case 4:
            cout << endl << "You chose ICT" << endl << endl;
            selectedCourse = "ICT";
            selectComputerCourse();
            break;
        default:
            break;
        }
    }

    void selectCourse() {
        cout << ">>>Course Selection<<<" << endl;
        cout << "<1> Business" << endl;
        cout << "<2> Computer course" << endl;
        cout << "<3> Data science" << endl;
        cout << "<4> ICT" << endl;
    }

    void selectComputerCourse() {
        int totalDuration = 0;
        int innerExpression = 0;
        while (true) {
            cout << endl << ">>>Enter choice for Computer course:<<<" << endl;
            cout << "<1> Course Level" << endl;
            cout << "<2> Preferred Way of Learning" << endl;
            cout << "<3> Duration for Each Day" << endl;
            cout << "<4> Exit" << endl;
            cin >> innerExpression;

            switch (innerExpression) {
            case 1: {
                int level = 0;
                cout << "Course Level:" << endl;
                cout << "<1> 1-2 weeks (basic)" << endl;
                cout << "<2> 2-3 weeks (intermediate)" << endl;
                cout << "<3> 6-7 weeks (advance)" << endl;
                cin >> level;
                switch (level) {
                case 1:
                    cout << "1-2 weeks (basic)" << endl;
                    courseLevel = "1-2 weeks (basic)";
                    totalDuration += 2;
                    break;
                case 2:
                    cout << "2-3 weeks (intermediate)" << endl;
                    courseLevel = "2-3 weeks (intermediate)";
                    totalDuration += 3;
                    break;
                case 3:
                    cout << "6-7 weeks (advance)" << endl;
                    courseLevel = "6-7 weeks (advance)";
                    totalDuration += 7;
                    break;
                default:
                    cout << "Invalid choice" << endl;
                    break;
                }
                break;
            }
            case 2: {
                int preferredWay = 0;
                cout << "Preferred Way of Learning:" << endl;
                cout << "<1> Guided project" << endl;
                cout << "<2> Personal practical" << endl;
                cout << "<3> Notes and concept learning" << endl;
                cin >> preferredWay;
                switch (preferredWay) {
                case 1:
                    cout << "Guided project" << endl;
                    preferredWayOfLearning = "Guided project";
                    break;
                case 2:
                    cout << "Personal practical" << endl;
                    preferredWayOfLearning = "Personal practical";
                    break;
                case 3:
                    cout << "Notes and concept learning" << endl;
                    preferredWayOfLearning = "Notes and concept learning";
                    break;
                default:
                    cout << "Invalid choice" << endl;
                    break;
                }
                break;
            }
            case 3: {
                int duration = 0;
                cout << "Duration for Each Day:" << endl;
                cout << "<1> 2 hours" << endl;
                cout << "<2> 4 hours" << endl;
                cout << "<3> 6 hours" << endl;
                cin >> duration;
                switch (duration) {
                case 1:
                    cout << "2 hours" << endl;
                    durationForEachDay = "2 hours";
                    break;
                case 2:
                    cout << "4 hours" << endl;
                    durationForEachDay = "4 hours";
                    break;
                case 3:
                    cout << "6 hours" << endl;
                    durationForEachDay = "6 hours";
                    break;
                default:
                    cout << "Invalid choice" << endl;
                    break;
                }
                break;
            }
            case 4:
                cout << "Exiting..." << endl;
                cout << "Total duration to complete the course: " << totalDuration << " weeks" << endl;
                storeDataToFile();
                return;
            default:
                cout << "Invalid choice" << endl;
                break;
            }
        }
    }

    void storeDataToFile() {
        ofstream file("elearning_data.txt", ios_base::app);
        if (file.is_open()) {
            file << "Selected Course: " << selectedCourse << endl;
            file << "Course Level: " << courseLevel << endl;
            file << "Preferred Way of Learning: " << preferredWayOfLearning << endl;
            file << "Duration for Each Day: " << durationForEachDay << endl;
            file << "--------------------------------------" << endl;
            file.close();
            cout << "Data saved to elearning_data.txt" << endl;
        } else {
            cout << "Unable to open file" << endl;
        }
    }
};

int main() {
    userInfo();

    elearning obj1;
    obj1.selectCourse();
    int userChoice;
    cout << "Enter your choice: ";
    cin >> userChoice;
    cin.ignore();

    elearning obj2(userChoice);

    return 0;
}
```

Photo:-