UNIVERSITY OF CENTRAL PUNJAB

FALL 2024

Course Title: Introduction to Computing

Course Code: CP103

Assignment No. 4

Topics: Week 11- 14	**Total Marks: 60**	**Obtained Marks:**

Registration No. : L1F24BSCS0938	**Date:** 28-1-2025
Section: A20	**Name:** Talha Khurram
All Questions Attempted (Y/N):	

CLO #	CLO Statement	Taxonomy Level	PLO
3	**Design and implement real-world problems using selection statements, loops, and one-dimensional arrays in C++.**	**C3 (Apply)**	**3**

Submission:

Soft Copy Deadline: 02-02-2025 till 11:59 PM via Portal

Hard Copy Deadline: 03-02-2025

Late Submission Policy:

- 10% Deduction /24 Hours.

Submission Marks:

- 5 marks are for submission.

Instructions: (5 marks will be deducted for not following the instructions)

- This is an individual assignment. Viva can be conducted OR a Quiz will be taken on the basis of assignment in the next week.
- Attempt all questions in sequence. Attach this title page as a front page of assignment.
- Assignment should be handwritten/printed on A4 sized page. **(No pages from register please.)**
- Submit Hard copy in class and scanned copy of solved assignment on the portal **(Both copies should be submitted before deadline)**

Rubrics for Assignment Evaluation:

Here are the criteria mentioned below for your assessment evaluation. Give it a read before attempt the assignment. You should read it properly for securing good marks.

Rubrics Detail/ Rubrics Criteria	**Above Average**	**Sufficient**	**Developing**	**Needs Improvement**	**Marks Distribution**	**Obtained Marks**	
Presentation of Assignment (The use of front page, page borders, page no's, table of contents, indentation, use of diagrams/ tables where required).	Excellent presentation, proper use of formatting.	Good presentation, minor issues.	Basic presentation, lacks organization.	Poor formatting, lacks clarity.	Above average = 3 marks Sufficient = 2 marks Developing = 1.5 marks Needs improvement = 1 mark	**Q1**	
						Q2	
						Q3	
Assignment structuring (proper use of headings & sub-headings, use of bullets & keywords where required and proper division according to the questions asked in assignment).	Excellent structure, clearly divided sections.	Well-structured, minor issues in layout.	Adequately structured but some parts unclear.	Poor structure, lacks organization.	Above average= 2 marks Sufficient = 1.5 marks Developing = 1 marks Needs improvement = 0.5 mark	**Q1**	
						Q2	
						Q3	
Program Logic (How well you design the solution to program logically. Right use of programming concepts).	Logical and well-thought-out solution.	Good solution, minor issues in logic.	Basic logic, some errors in understanding.	Poor logic, major conceptual issues.	Above average= 5 marks Sufficient = 3.5 marks Developing = 2.5 marks Needs improvement = 2 marks	**Q1**	
						Q2	
						Q3	
Program Ethics (Use of proper naming conventions in program, indentation & no. of lines)	Excellent naming, formatting, and code structure.	Good adherence to coding practices, minor flaws.	Adequate formatting, naming, or structure.	Poor adherence to coding standards.	Above average= 5 marks Sufficient = 3.5 marks Developing = 2.5 marks Needs improvement = 2 marks	**Q1**	
						Q2	
						Q3	
Correct Output (Correction of program output, does the program implementing the things for which it was designed?)	Fully correct output, implements all tasks.	Correct output, minor issues in functionality.	Partially correct output, incomplete functionality.	Incorrect output, does not meet requirements.	Above average= 5 marks Sufficient = 3.5 marks Developing = 2.5 marks Needs improvement = 2 marks	**Q1**	
						Q2	
						Q3	

Introduction to Computing (Fall 2024) - Assignment 4

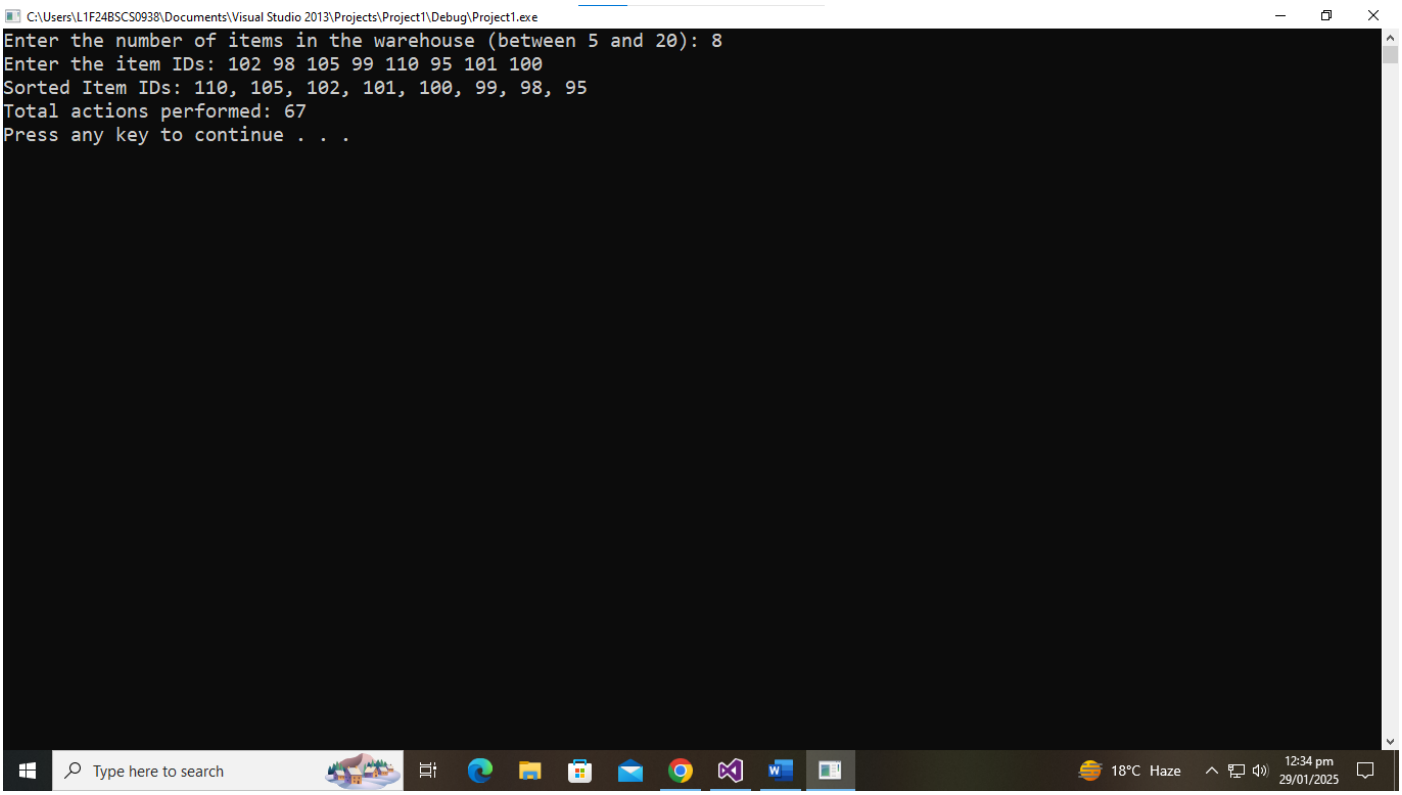
Question 1

Program :

```
#include <iostream>
using namespace std;

int main() {
  const int MAX_ITEMS = 20;  // maximum number of ids
  int nofitems = 0;
  int actionscount = 0;
  int arrayofids[MAX_ITEMS] = {0};
  cout << "Enter the number of items in the warehouse (between 5 and
20): ";
  cin >> nofitems;

  if (nofitems >= 5 && nofitems <= 20) {
    cout << "Enter the item IDs: ";

    for (int id = 0; id < nofitems; id++) {
      cin >> arrayofids[id];
    }

    for (int passes = 0; passes < nofitems; passes++) {
      for (int iter = 0; iter < nofitems - passes - 1; iter++) {
        actionscount++;  // counting 1 action for comparison
        if (arrayofids[iter] < arrayofids[iter + 1]) {
          int temp = arrayofids[iter];
          arrayofids[iter] = arrayofids[iter + 1];
          arrayofids[iter + 1] = temp;

          actionscount += 3;  // counting 3 actions for swapping
        }
```

```
      }
    }

    cout << "Sorted Item IDs: ";

    for (int sortid = 0; sortid < nofitems; sortid++) {
      cout << arrayofids[sortid];
      if (sortid != nofitems - 1) cout << ", ";  // checking for last
comma
    }

    cout << endl;

    cout << "Total actions performed: " << actionscount << endl;

  } else {
    cout << "Invalid input. Please enter a value between 5 and 20. " <<
endl;
  }

  system("pause");
  return 0;
}
```

Output :

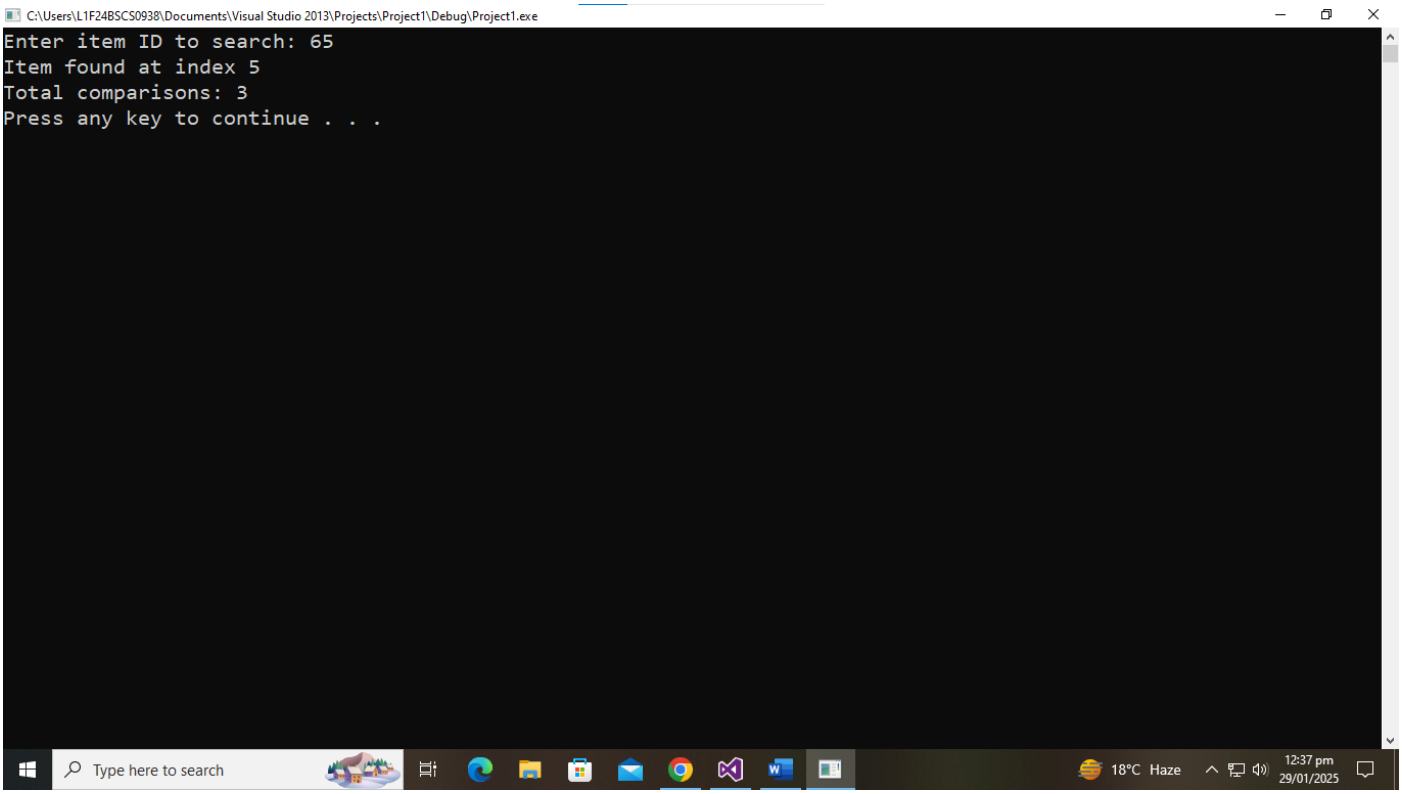


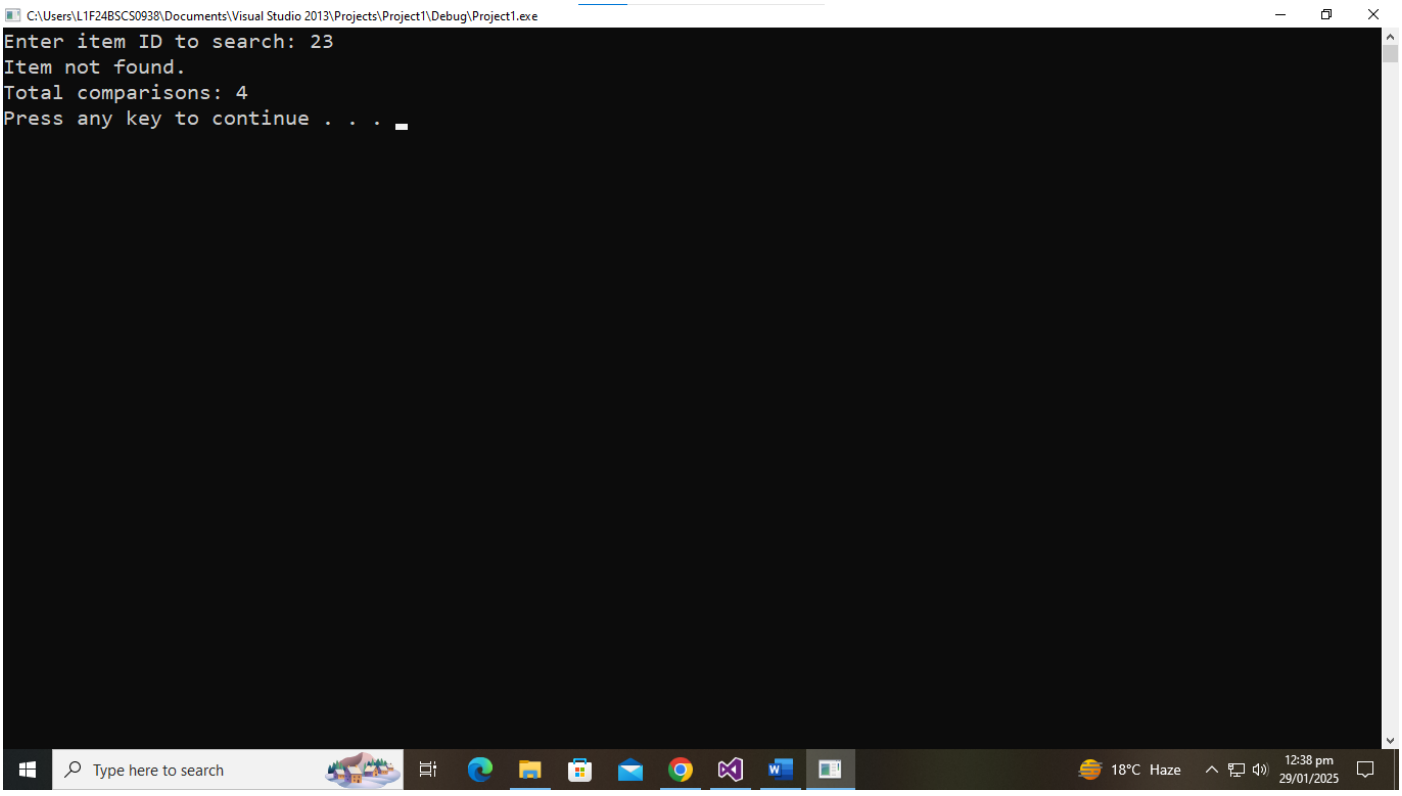
Question 2

Program :

```cpp
#include <iostream>
using namespace std;

int main() {
    int arrofids[] = {105, 94, 84, 75, 69, 65, 56, 43, 34, 2};
    int itemid;

    int totalids = sizeof(arrofids)/sizeof(arrofids[0]);

    cout << "Enter item ID to search: ";
    cin >> itemid;

    int start=0, end=totalids-1 ,loc=-1, mid;
    int comparisoncount = 0;

    while (start <= end){
        mid = (start + end)/2;
        comparisoncount++; // increasing count on each comparison
        if (arrofids[mid] == itemid) {
            loc = mid;
            break;
        } else if (arrofids[mid] < itemid) {
            end = mid - 1;
        } else {
            start = mid + 1;
        }
    }

    if (loc == -1) {
        cout << "Item not found.  " << endl;
    } else {
        cout << "Item found at index " << loc << endl;
    }

    cout << "Total comparisons: " << comparisoncount << endl;

    return 0;
}
```

Output :


C:\Users\L1F24BSCS0938\Documents\Visual Studio 2013\Projects\Project1\Debug\Project1.exe
Enter item ID to search: 65
Item found at index 5
Total comparisons: 3
Press any key to continue . . .
Type here to search
18°C Haze
12:37 pm
29/01/2025


C:\Users\L1F24BSCS0938\Documents\Visual Studio 2013\Projects\Project1\Debug\Project1.exe
Enter item ID to search: 23
Item not found.
Total comparisons: 4
Press any key to continue . . .
Type here to search
18°C Haze
12:38 pm
29/01/2025

Question 3

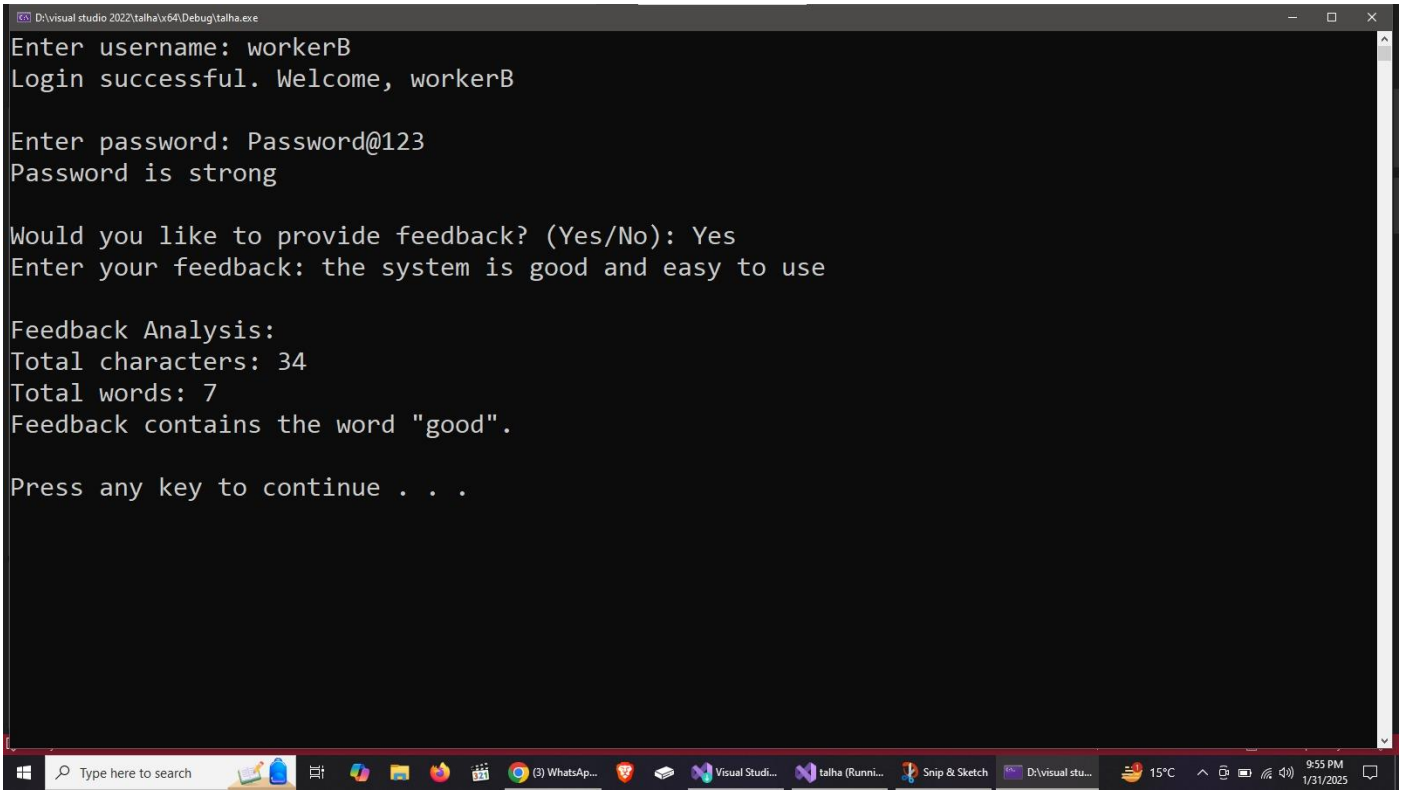
Program :

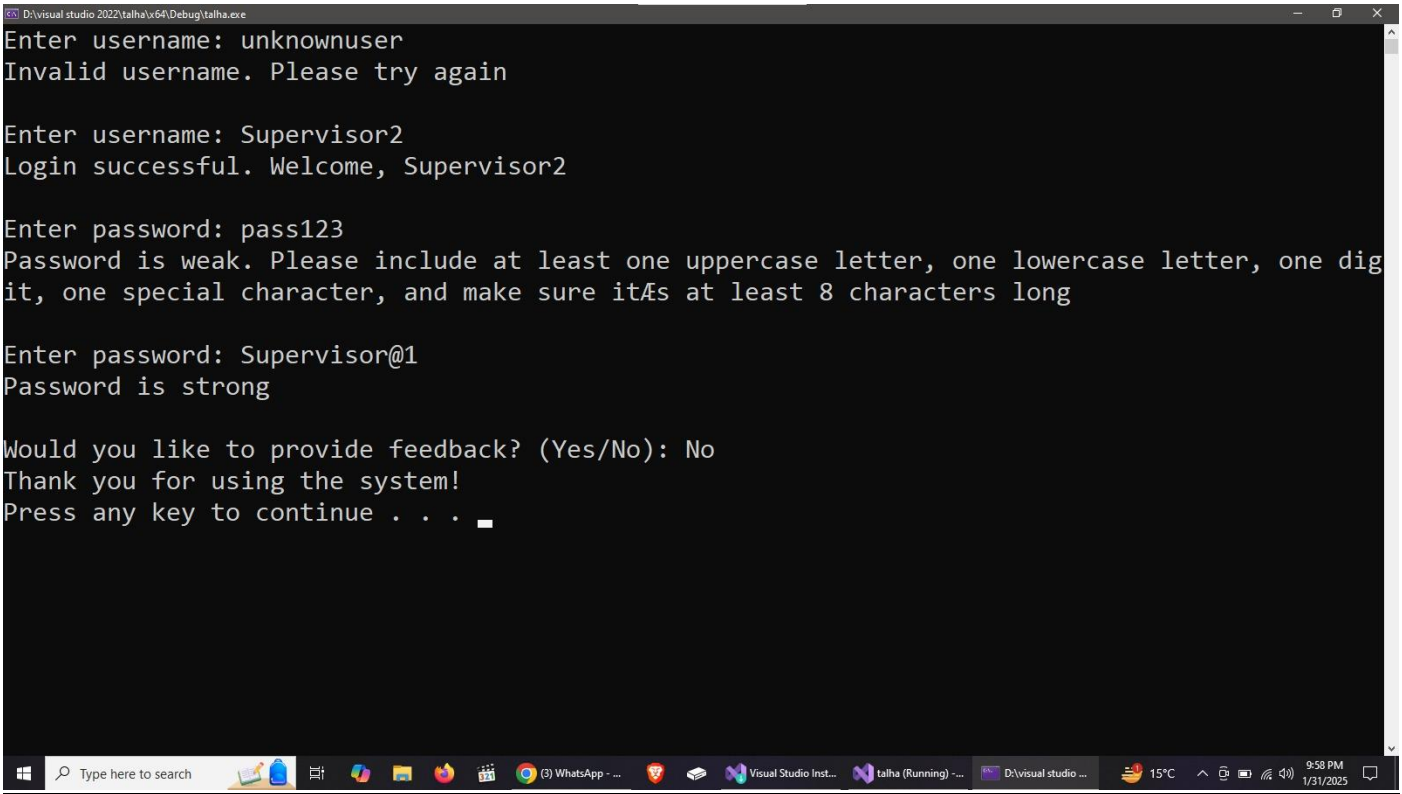
```
#include <cstring>
#include <iostream>
using namespace std;

int main() {

  char approvedusernames[10][50] = {"manager1","manager2","manager3",
"supervisor1","supervisor2", "supervisor3",
"workerA",  "workerB","workerC","user1"}; // using a 2D array to store
usernames bcz there  is no other way to do it

  char enteredusername[50];
  bool isValidusername = false;
  int lengthofappusers = sizeof(approvedusernames) / sizeof(approvedusernames[0]);

  while (!isValidusername) {
    cout << "Enter username: ";
    cin >> enteredusername;

    for (int i = 0; i < lengthofappusers; i++) {
      bool isMatched = true;

      for (int j = 0;
           approvedusernames[i][j] != '\0' || enteredusername[j] !=
'\0'; j++) {
        if (tolower(approvedusernames[i][j]) != tolower(enteredusername[j])) {
          isMatched = false;
          break;
        }
      }

     if (isMatched) {
        cout << "Login successful. Welcome, " << enteredusername <<
endl;
        isValidusername = true;
        break;
      }
    }
```

```
  if (!isValidusername) {
    cout << "Invalid username. Please try again" << endl;
  }

  cout << endl;
}

bool isValidPassword = false;
char password[8];

while (!isValidPassword) {
  cout << "Enter password: ";
  cin >> password;

  int paslength = 0;
  bool isUpper = false, isLower = false, isDigit = false, isspecch = false;

  for (int i = 0; password[i] != '\0'; i++) {
    paslength++;
    if (password[i] >= 'A' && password[i] <= 'Z') isUpper = true;
    if (password[i] >= 'a' && password[i] <= 'z') isLower = true;
    if (password[i] >= '0' && password[i] <= '9') isDigit = true;

    if (password[i] == '@' || password[i] == '#' || password[i] == '_' ||
        password[i] == '!')
      isspecch = true;
  }

  if (paslength >= 8 && isUpper && isLower && isDigit && isspecch) {
    cout << "Password is strong" << endl;
    isValidPassword = true;
  } else {
   cout << "Password is weak. Please include at least one uppercase
   letter, one lowercase letter, one digit, one special character, and
   make sure it\'s at least 8 characters long " << endl;
  }

  cout << endl;
}


char response[4];
cout << "Would you like to provide feedback? (Yes/No): ";
cin >> response;
```

```
  char feedback[100];
  int tchars = 0, twords = 0;
  bool containsgood = false;

  if (strcmp(response, "Yes") == 0) {
    cout << "Enter your feedback: ";
    cin.ignore();                 // for clearing the previous input
    cin.getline(feedback, 101);  // using getline to get sentence input
from user bcz it cannot be done in any other way

    cout << endl;

    for (int ch = 0; feedback[ch] != '\0'; ch++) {
      tchars++;
      if (feedback[ch] == ' ' || feedback[ch] == '\0') twords++;
      if (feedback[ch] == 'g' && feedback[ch + 1] == 'o' &&
          feedback[ch + 2] == 'o' && feedback[ch + 3] == 'd') {
        containsgood = true;
      }
    }

    cout << "Feedback Analysis:  " << endl;
    cout << "Total characters: " << tchars << endl;
    cout << "Total words: " << twords << endl;

    if (containsgood) {
      cout << "Feedback contains the word \"good\"." << endl;
    } else {
      cout << "Feedback not contains the word \"good\"." << endl;
    }

    cout << endl;

  } else {
    cout << "Thank you for using the system!" << endl;
  }

  system("pause");

  return 0;

}
```

Output :


D:\visual studio 2022\talha\x64\Debug\talha.exe
Enter username: workerB
Login successful. Welcome, workerB
Enter password: Password@123
Password is strong
Would you like to provide feedback? (Yes/No): Yes
Enter your feedback: the system is good and easy to use
Feedback Analysis:
Total characters: 34
Total words: 7
Feedback contains the word "good".
Press any key to continue . . .
Type here to search
15°C
9:55 PM
1/31/2025


D:\visual studio 2022\talha\x64\Debug\talha.exe
Enter username: unknownuser
Invalid username. Please try again
Enter username: Supervisor2
Login successful. Welcome, Supervisor2
Enter password: pass123
Password is weak. Please include at least one uppercase letter, one lowercase letter, one dig
it, one special character, and make sure itÆs at least 8 characters long
Enter password: Supervisor@1
Password is strong
Would you like to provide feedback? (Yes/No): No
Thank you for using the system!
Press any key to continue . . .
Type here to search
15°C
9:58 PM
1/31/2025