Fast National University of computing and Emerging Sciences

Peshawar Campus

Programming Fundamentals

Practice Problem

Note:

Just do 5 or 3 question from each Topic (3 from basic , 3 from medium and 2 from advance)

File Handling Questions (30 Questions)

Basic (10 Questions)

1. Write a program to create a file named `data.txt` and write the text “Hello, World!” into it.
2. Write a program to read the contents of a file `input.txt` and display it on the console.
3. Write a program to append “Welcome to C++!” to an existing file `sample.txt`.
4. Create a program to count the number of lines in a given file.
5. Write a program to count the number of words in a file `textfile.txt`.
6. Write a program to check if a file exists or not using C++ file handling functions.
7. Write a program to copy the contents of `source.txt` to `destination.txt`.
8. Write a program to create a file, take input from the user, and save it into the file.
9. Write a program to count the number of vowels, consonants, and digits in a file.
10. Write a program to find and replace a word in a file with another word.

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Medium (10 Questions)

11. Write a program to read data (name, age, and marks) for 5 students from the user and save it into a file.
12. Write a program to read a list of integers from a file and find their sum and average.
13. Write a program to read data from a file and count the frequency of each word.
14. Write a program to reverse the contents of a file.
15. Write a program to merge the contents of two files (`file1.txt` and `file2.txt`) into a new file `merged.txt`.
16. Write a program to read a matrix (2D array) from a file and display it on the console.
17. Write a program to read a list of numbers from a file and find the maximum and minimum values.
18. Write a program to write the multiplication table of a given number into a file.
19. Write a program to check if two files have the same content.
20. Write a program to read a text file and remove all blank spaces from it.

Advanced (10 Questions)

21. Write a program to encrypt the contents of a file by shifting each character by 2 positions (e.g., `A` → `C`).
22. Write a program to read a text file and display the content in reverse order (line by line).
23. Write a program to sort a list of numbers stored in a file and save the sorted list into a new file.
24. Write a program to read data of students (roll number, marks) from a file and display students with marks greater than 80.
25. Write a program to split a large file into smaller files of equal size.
26. Write a program to convert all lowercase characters in a file to uppercase and save it into a new file.

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27. Write a program to implement a simple grading system that reads student scores from a file and assigns grades.
28. Write a program to count the frequency of each character in a file and save the result to a new file.
29. Write a program to compare two files and output the line number where they differ.
30. Write a program to generate a report of students' attendance from a given input file.

Real-World Questions (30 Questions)

Basic (10 Questions)

1. Write a program to calculate the sum and average of an array of 10 integers.
2. Write a program to find the largest and smallest number in an array.
3. Write a program to take an array of 10 integers from the user and display them in reverse order.
4. Write a program to find the second largest number in an array.
5. Write a program to search for an element in an array using linear search.
6. Write a program to find the sum of each row in a 2D array (matrix).
7. Write a program to add two 2D arrays (matrices) of size 3x3.
8. Write a program to find the transpose of a matrix (swap rows with columns).
9. Write a program to count the occurrence of a specific number in an array.
10. Write a program to determine whether a given 2D matrix is symmetric or not.

Medium (10 Questions)

11. Write a program to find the sum of all even and odd numbers in an array.
12. Write a program to rotate an array to the left by 2 positions.
13. Write a program to find the maximum sum of any row or column in a 2D array.
14. Write a program to remove duplicate elements from an array.
15. Write a program to merge two sorted arrays into a single sorted array.
16. Write a program to multiply two matrices and display the result.

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17. Write a program to calculate the monthly salary of an employee based on hourly pay and hours worked.
18. Write a program to generate a report of student grades based on their scores (stored in an array).
19. Write a program to sort an array using the selection sort algorithm.
20. Write a program to find all prime numbers in an array.

Advanced (10 Questions)

21. Write a program to implement a simple inventory system for a shop, storing quantities of 5 products in an array.
22. Write a program to determine if a given 2D array is a magic square (sum of rows, columns, and diagonals are equal).
23. Write a program to simulate a basic weather data system: store temperatures for a week and calculate average temperature.
24. Write a program to create a frequency table for marks scored by students in an exam.
25. Write a program to shift all zero elements in an array to the end without changing the order of other elements.
26. Write a program to check if a given matrix is an identity matrix.
27. Write a program to implement a simple calendar system that stores events for a week in a 2D array.
28. Write a program to find the pair of numbers in an array whose sum equals a target value.
29. Write a program to solve the “saddle point” problem in a 2D matrix (minimum in a row, maximum in a column).
30. Write a program to simulate a basic expense tracker: read expenses for a month, calculate totals, and find the highest expense.

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Scenario Based Questions (ALL Topic)

Basic Scenario-Based Questions (10 Questions)

1. **Employee Attendance Tracker**: Write a program to store the attendance (0 for absent, 1 for present) of 5 employees over 7 days using a 2D array. Calculate and display the total days each employee was present.
2. **Temperature Monitoring**: A city records its temperature for 7 days. Write a program to input and store temperatures in an array and find the hottest and coldest day.
3. **Student Marks Analyzer**: Input marks of 10 students in an array. Write a program to calculate the average marks and identify students scoring above the average.
4. **Simple Voting System**: Write a program to simulate a voting system where voters choose among 3 candidates. Count the votes for each candidate and display the winner.
5. **Store Inventory Update**: Write a program to maintain a stock inventory for 5 products. Input initial quantities and update the stock after selling some units. Display remaining stock.
6. **Rainfall Report**: Record daily rainfall for 7 days in a 1D array. Write a program to calculate total rainfall and find the day with the maximum rainfall.
7. **Movie Ticket Sales**: Simulate ticket sales for a cinema with 5 rows and 10 seats (2D array). Input seat bookings (0 for unbooked, 1 for booked) and display the total seats booked and available.
8. **Classroom Attendance Management**: Create a program to store attendance data for 5 classes over 10 days. Display the total number of students who attended on each day.
9. **Marks Comparison**: Input marks of 5 students in 3 subjects. Write a program to determine the student with the highest total marks.
10. **Bill Splitter**: Write a program to take the expenses for 5 friends on a trip. Calculate the total expense and find how much each person should pay to split the bill equally.

Medium Scenario-Based Questions (10 Questions)

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11. **Monthly Expense Tracker**: Input monthly expenses for 12 months in an array. Find the month with the highest expense and calculate the yearly average.
12. **Hospital Bed Occupancy**: A hospital has 4 wards with 6 beds each. Use a 2D array to simulate bed occupancy (1 for occupied, 0 for vacant). Display the total vacant and occupied beds.
13. **Product Demand Analysis**: Input the monthly demand for 6 products over 3 months using a 2D array. Identify which product had the highest total demand.
14. **Exam Performance Analysis**: Input scores of 5 students in 4 subjects using a 2D array. Determine the subject with the highest average marks.
15. **Election Result Analyzer**: Simulate votes for 3 candidates across 5 regions. Use a 2D array to store votes and determine the winner in each region.
16. **Shopping Cart Total**: Create a program that takes the prices of 10 items. Calculate the total bill and apply a discount of 10% if the total exceeds $500.
17. **Game Score Tracker**: Store the scores of 5 players across 3 rounds in a 2D array. Find the player with the highest overall score.
18. **Daily Sales Report**: Input sales data for 7 days in a 2D array (3 products per day). Calculate the total sales for each product and the day with the highest overall sales.
19. **Matrix Border Sum**: Input a 4x4 matrix. Write a program to calculate the sum of elements on the border of the matrix.
20. **Bus Seat Reservation**: A bus has 5 rows with 4 seats each. Use a 2D array to manage seat reservations. Display available and occupied seats.

Advanced Scenario-Based Questions (10 Questions)

21. **Electricity Bill Calculator**: Input the monthly electricity usage of 5 houses in an array. Calculate the bill for each house using the given rate (e.g., $0.15 per unit). Display the house with the highest bill.
22. **Warehouse Inventory Management**: Store inventory for 6 products across 3 warehouses in a 2D array. Find the warehouse with the maximum stock for each product.

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23. **Airline Seat Booking System**: Simulate an airline seat booking system (8 rows, 6 seats per row). Allow users to book seats and display the updated seat map.
24. **Sports Tournament Scores**: Input scores for 4 teams playing 3 matches each. Determine the team with the highest total score.
25. **Library Book Return System**: Create a program to track book return dates for 5 users (use a 2D array to store return dates). Check which users have overdue books based on a given current date.
26. **Company Sales Analysis**: Store quarterly sales data for 5 branches of a company in a 2D array. Calculate the branch with the highest annual sales.
27. **Matrix Diagonal Sum**: Input a 5x5 matrix and calculate the sum of its main diagonal and secondary diagonal elements.
28. **Parking Lot Management**: Simulate a parking lot with 4 levels and 10 slots each. Use a 2D array to track car occupancy. Calculate total available and occupied slots.
29. **Marks Histogram**: Input marks for 10 students in an array. Display a histogram of their marks using stars (*) where each star represents 10 marks.
30. **Store Discount System**: Write a program that calculates the discount for a store's customers based on purchase amounts:

- No discount for purchases under $100.
- 10% discount for purchases between $100 and $500.
- 20% discount for purchases above $500.

Best of Luck For your Exams

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