Last Date for submission is March 25th, 2024

Problem-Based Assignment (22SW-I)

Of

Data Structure and Algorithms

22SW Batch

Dr. Mohsin Ali Memon

Dataset: https://www.kaggle.com/datasets/whenamancodes/students-performance-in-exams

Step 1: Make two separate linked lists for male and female students containing group, math score, reading score, writing score and parental level.

Step 2: Now make two stacks based on the average marks obtained by male and female students (lowest on bottom, highest on top) using linked lists in step 1.

Step 3: Develop separate queues for various parental level of students containing average marks and gender of students from both stacks made in step 2.

Step 4: Develop separate queues for various groups of students containing average marks and gender of students from both stacks made in step 2.

Problem 1: How to find the best average marks of group A and D using data from step 4.

Problem 2: Which gender has performed better at various parental level of students from step 3.

Problem 3: Which group has performed better at all parental level levels of students.

Problem 4: What is the median of average marks obtained by male and female students.

Make the algorithm and code for the above mentioned problems

Rubric for problem-based learning assignment

	Good (2.5 marks)	Fair (1.5 mark)	Unsatisfactory (1 mark)	Not Submitted(0 mark)
Data Structure creation	Demonstrates the ability to create data structures correctly.	Demonstrates a moderate level of ability to create data structures.	Not able to create data structures properly.	Not submitted
Organization & Structure of algorithms	The algorithms are well organized in a tight and logical fashion.	The algorithms are partially organized in a logical fashion.	The algorithms are not well organized in a tight and logical fashion.	Not submitted
Code Completeness	Demonstrates an in-depth, high-level understanding of the problems with complete code.	Demonstrates a moderate level of understanding of the problems with some code.	Fails to demonstrate an understanding of the problems and code.	Not submitted
Result Accuracy	The results presented are accurate.	The results presented are partially accurate.	The results are not in presentable form.	Not submitted

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Problem-Based Assignment (22SW-II)

Of

Data Structure and Algorithms

22SW Batch

Dr. Mohsin Ali Memon

Dataset: https://www.kaggle.com/datasets/hasibalmuzdadid/global-life-expectancy-historical-dataset

Step 1: Make a hashtable storing countries and their life expectancy in each year given in the data set.

Step 2: Now make queues (one for each year) from hashtable storing country names based on life expectancy in ascending order.

Step 3: Make a stack containing the countries names based on the best life expectancy (average of all years given in the dataset) on top using step 3 only.

Problem 1: How to find out which countries were providing best life expectancy during year 1962 and 1964.

Problem 2: How to search and display life expectancy of a country in each year using Step 1.

Problem 3: Which country is providing best, average and worst life expectancy (Use step 3 data structure).

Postulate 1: Is it true that the countries whose name start with A are providing better life expectancy than the rest of the countries.

Make the algorithm and code (use GUI or command line for results) for the above mentioned problems

Rubric for problem-based learning assignment

	Good (2.5 marks)	Fair (1.5 mark)	Unsatisfactory (1 mark)	Not Submitted(0 mark)
Data Structure creation	Demonstrates the ability to create data structures correctly.	Demonstrates a moderate level of ability to create data structures.	Not able to create data structures properly.	Not submitted
Organization & Structure of algorithms	The algorithms are well organized in a tight and logical fashion.	The algorithms are partially organized in a logical fashion.	The algorithms are not well organized in a tight and logical fashion.	Not submitted
Code Completeness	Demonstrates an in-depth, high-level understanding of the problems with complete code.	Demonstrates a moderate level of understanding of the problems with some code.	Fails to demonstrate an understanding of the problems and code.	Not submitted
Result Accuracy	The results presented are accurate.	The results presented are partially accurate.	The results are not in presentable form.	Not submitted

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Problem-Based Assignment (22SW-III)

Of

Data Structure and Algorithms

22SW Batch

Dr. Mohsin Ali Memon

Dataset: https://www.kaggle.com/datasets/pyatakov/india-agriculture-crop-production

Step 1: Make linkedlists, one for each state containing district, crop and year data.

Step 2: Make a stack containing count of same crops with crop name for each state using Step 1. The crop with higher count sits at the bottom where as crop with lower count sits at the top.

Step 3: Make queue for 'Andhra Pradesh' state and keep crop data based on year column.

Problem 1: How to find the most popular crop in a particular year.

Problem 2: Which state is popular for which type of crop?

Problem 3: Find the most recent and most oldest crop of 'Andhra Pradesh' state.

Make the algorithm and code (GUI or command line for results) for the above mentioned problems.

Rubric for problem-based learning assignment

	Good (2.5 marks)	Fair (1.5 mark)	Unsatisfactory (1 mark)	Not Submitted(0 mark)
Data Structure creation	Demonstrates the ability to create data structures correctly.	Demonstrates a moderate level of ability to create data structures.	Not able to create data structures properly.	Not submitted
Organization & Structure of algorithms	The algorithms are well organized in a tight and logical fashion.	The algorithms are partially organized in a logical fashion.	The algorithms are not well organized in a tight and logical fashion.	Not submitted
Code Completeness	Demonstrates an in-depth, high-level understanding of the problems with complete code.	Demonstrates a moderate level of understanding of the problems with some code.	Fails to demonstrate an understanding of the problems and code.	Not submitted
Result Accuracy	The results presented are accurate.	The results presented are partially accurate.	The results are not in presentable form.	Not submitted