Question 1(a)

Input:-

User’s input:

1. First, second, third and fourth test scores
2. Weight of first, second, third and fourth test scores

Output:-

1. Weighted average of the 4 test scores

Problem analysis:-

The question required us to find the weighted average of the 4 test scores. The test scores and their respective weight are needed in order to calculate the weighted average of the 4 test scores. First, users need to input the data for the 4 test scores and their respective weights. Then, a formula is needed to find weighted average of the 4 test scores.

average = testScore1 \* weightTestScore1 + testScore2 \* weightTestScore2 + testScore3 \* weightTestScore3 + testScore4 \* weightTestScore4

Algorithm design:-

1. Get testScore1, weightTestScore1.
2. Get testScore2, weightTestScore2.
3. Get testScore3, weightTestScore3.
4. Get testScore4, weightTestScore4.
5. Get the weights of the respective test scores.
6. Calculate the weighted average of the 4 test scores:

average = testScore1 \* weightTestScore1 + testScore2 \* weightTestScore2 + testScore3 \* weightTestScore3 + testScore4 \* weightTestScore4

1. Output testScore1, weightTestScore1.
2. Output testScore2, weightTestScore2.
3. Output testScore3, weightTestScore3.
4. Output testScore4, weightTestScore4.
5. Output the weighted average of the 4 test scores.

Variables:-

1. int testScore1, testScore2, testScore3, testScore4
2. double weightTestScore1, weightTestScore2, weightTestScore3, weightTestScore4
3. double average

Main algorithm:-

Pseudo code:

1. BEGIN
2. Prompt the user for input.
3. Get testScore1, weightTestScore1.
4. Get testScore2, weightTestScore2.
5. Get testScore3, weightTestScore3.
6. Get testScore4, weightTestScore4.
7. Get the weights of the respective test scores.
8. Calculate the weighted average of the 4 test scores:

average = testScore1 \* weightTestScore1 + testScore2 \* weightTestScore2 + testScore3 \* weightTestScore3 + testScore4 \* weightTestScore4

1. Output testScore1, weightTestScore1.
2. Output testScore2, weightTestScore2.
3. Output testScore3, weightTestScore3.
4. Output testScore4, weightTestScore4.
5. Output the weighted average of the 4 test scores.
6. END

Sample output:-

Please enter the first test score: 72

Please enter the weight of the first test score: 0.35

Please enter the second test score: 95

Please enter the weight of the second test score: 0.30

Please enter the third test score: 88

Please enter the weight of the third test score: 0.20

Please enter the fourth test score: 65

Please enter the weight of the fourth test score: 0.15

The weighted average of the 4 test scores is: 81.05

Question 1(b)

Input:-

User’s input:

1. Test scores
2. Number of test scores, n

Output:-

1. Weight average of test scores

Problem analysis:-

The question required us to find the weighted average of n test scores. The total number of the test scores, the test scores and their respective weights are needed to calculate the weight average. First, initialise the current number of test score, i, to 0, and also initialise the weighted average of the test scores to 0. Then, enter the number of test scores, n. While the current number of test score, i is smaller than the total number of test score, n, the loop will be executed, which the loop will ask users to input the test score and its respective weight. A formula is also inside the loop which will calculate the current total weighted average of the test scores, which is:

average = average + (testScore \* weightTestScore)

Then, the post-increment operator, i++, will be used to increase the current number of the test scores, i. Once the current number of test score, i, does not meet the contidion, the loop will be exited. After that, the final weighted average of n test scores, n, will be shown.

Algorithm design:-

1. Initialise the value of i to 0.
2. Initialise the value of average to 0.
3. Get the number of test scores, n.
4. While the current number of test scores, i, is smaller than the total number of test scores, n, a loop will be executed.
   1. Get the test score and its weight.
   2. Calculate the current weighted average of the test scores by using the formula:

average = average + (testScore \* weightTestScore)

* 1. Insert the post-increment operator, i++ to increase the current number of test scores, i.

1. While the current number of test score, I, does not meet the condition, the loop will be exited.
2. Output the weighted average of the n test scores.

Variables:-

1. int testScore
2. int n
3. int i
4. double weightTestScore
5. double average

Main algorithm:-

1. START
2. Initialise the value of i to 0.
3. Initialise the value of average to 0.
4. Get the number of test scores, n.
5. While the current number of test scores, i, is smaller than the total number of test scores, n, a loop will be executed.
   1. Get the test score and its weight.
   2. Calculate the current weighted average of the test scores by using the formula:

average = average + (testScore \* weightTestScore)

* 1. Insert the post-incremnt operator, i++ to increase the current number of test scores, i.

1. While the current number of test score, I, does not meet the condition, the loop will be exited.
2. Output the weighted average of the n test scores.
3. END

Sample output:-

Please enter the number of test score: 4

Please enter the test score: 72

Please enter the weight of the test score: 0.35

Please enter the test score: 95

Please enter the weight of the test score: 0.30

Please enter the test score: 88

Please enter the weight of the test score: 0.20

Please enter he test score: 65

Please enter the weight of the test score: 0.15

The weighted average of test scores is: 81.05