Vellore - 632 014, Tamil Nadu, India

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING
DIGITAL ASSIGNEMENT- I

Human Computer Interaction – CSE4015 – G2 slot

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Q1. Design an efficient algorithm that achieves the following task: Given an array A[1..n] of floating point numbers, it returns a two-dimensional array, say M, of size n × n in which the entry M[i][j] for i ≤ j contains the average of the array entries A[i] through A[j]. That is: if i ≤ j, then

$$M[i][j] = \frac{A[i] + \cdots + A[j]}{j - i + 1}$$

whereas for i > j we have that M[i][j] = 0

1. Describe your idea for an algorithm that creates this matrix.
2. Write down the algorithm in pseudocode.
3. How many assignments operations will your algorithm perform for an input of size n?
4. Implement the algorithm in the C language and produce results.
5. Calculate the time complexity for running your algorithm with n input.

Q2. A palindrome is a phrase that reads the same forward and backward (examples: ‘racecar’, ‘radar’, ‘noon’, or ‘rats live on no evil star’). By extension we call every string a palindrome that reads the same from left to right and from right to left. Develop a recursive algorithm that takes as input a string and decides whether the string is a palindrome. Use appropriate date structure to implement the same, without using built in function.

Q1: 07 marks
Q2: 03 Marks
