 **BAHRIA UNIVERSITY (KARACHI CAMPUS)**

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| **CSC 221 - Data Structures & Algorithms – Assignment 1** | |
| CLO-3 | Deadline: 26th October, 22 |
| Class: BSE-3B | Total Marks 5 |

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Course : Data Structures & Algorithms

**Question:** Suppose a linked list in a memory consisting of numerical values.

Propose an algorithm for each of the following tasks:

1. Maximum value in the list
2. Mean value in the list
3. Product of all elements in the list

**Link List Contain Element Are :**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **5** | **10** | **12** | **8** | **6** | **3** | **1** | **5** | **4** | **10** |

**Solution:**

1. Maximum value in the list

**Algorithm To Find Largest Element**

Step 1: Let create and initialize **max** with head node value.

Step 2: We write While Loop and loop will be continuing until node is not equal to null (**node != null**).

Step 3: Now we put if condition so if **max** value is less than current node value (**max <** **node.data**) then initialize current node value in max variable (**max=node.data**) otherwise **max** value would be same.

Step 4: We initialize node with node.next (**node=node.next**) so we could get value of each node in node variable and compare with max variable.

Step 5: Return max value which is largest value in node.

1. **Mean value in the list**

**Mean value in the list**

Step 1: let create and initialize **sum** with head node's value, **mean**, **n** with 0 and **i** with 1.

Step 2: We start **while loop** and loop is continuing until the node value is not equal to null.

Step 3: let add value of current node data in **sum** variable (**sum+=node.data**) and initialize n with i value (n=i).

Step 4: We initialize node with node.next (**node=node.next**) so we could get value of each node in node variable and increment value of i with 1 (**i++).**

Step 5: let get mean by sum and divide sum value from n value (mean=sum/n).

Step 6: Return mean value.

1. **Product of all elements in the list**

**Product of all elements in the list.**

Step 1: let create and initialize **product** with head node value.

Step 2: We put while Loop and while loop is continuing until node.next is not equal to null (node!=null).

Step 3: We initialize node with node.next (node=node.next). and we put the value of node data in **product** variable and multiply product with previous value (**product=product \* node.data**). By this way, the value of next node is coming in node variable and multiply with product value.

Step 4: Return **product** value which is multiply of all node values.