|  |  |
| --- | --- |
| **Data Structures & Algorithms**  Diploma in CSF, IT  Year 2/3 (2020/21) Semester 4/6 | **Week 2** |
| **1-2 Hours** |
| **Tutorial 2 – Data Abstraction** | |

1. List 3 real-life examples in additional to the two already given, where the concept of lists can be adopted.

* Name list
* Contact list

1. Product list
2. Time log list
3. Credit card list

2. If listA is an empty list of integers, what does it contain after the following statements are executed?

|  |  |
| --- | --- |
| **Statements** | **Content of listA** |
| listA.add(20); | 20 |
| listA.add(0, 30); | 30, 20 |
| listA.add(10); | 30,20,10 |
| listA.add(2, 50); | 30,20,50,10 |
| listA.add(1, 40); | 30,40,20,50,10 |
| listA.remove(1); | 30,20,50,10 |
| listA.remove(2); | 30,20,10 |

3. Suppose you want to include another operation in the List ADT to display all the items in the list:

(a) Specify the operation (as in .h)

|  |
| --- |
| void print(); |

(b) Implement the operation (as in .cpp)

|  |
| --- |
| void List::print()  {  for (int a = 0; a < size; a++) {  cout << items[a] << endl;  }  cout << "" << endl;  } |

4. Suppose you want to include another operation in the List ADT to replace an item in a certain specified position in the list:

(a) Specify the operation

|  |
| --- |
| void replace(int index, ItemType item); |

(b) Implement the operation

|  |
| --- |
| void List::replace(int index, ItemType item) {  bool success = (index >= 0) && (index <= size) && (size < MAX\_SIZE);  if (success)  {  items[index] = item;  }  } |