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| **Data Structures & Algorithms**  Diploma in IT, ISF  Year 2 (2017/18) Semester 4 | **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
* Address list

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

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| **Statements** | **Content of listA** |
| listA.add(20); | 20 |
| listA.add(1, 30); | 30, 20 |
| listA.add(10); | 30,20,10 |
| listA.add(2, 50); | 30,20,50,10 |
| listA.add(4, 40); | 30,20,50,40,10 |
| listA.remove(2); | 30,50,40,10 |
| listA.remove(2); | 30,40,10 |

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)

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| --- |
| // display all items in the list  //pre : none  // post : none  Void List::display(); |
|  |

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

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| Void list::display(){ {  for (int i=1; i<=getLength(); i++)  cout << get(i) << 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

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| Void List::replace (int index, ItemType item); |

(b) Implement the operation

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| // replace the item in the specified index in the list  **void List::replace(int index, ItemType item)**  {  bool success = index >= 1 && index <= getLength();  if (success)  items[index-1] = item;  } |