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| **Data Structures & Algorithms**  Diploma in IT, ISF, FI  Year 2 (2018/19) 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
* Grocery list
* Music playlist
* Restaurant menu

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, 50, 20, 10 |
| listA.add(4, 40); | 30, 50, 20, 40, 10 |
| listA.remove(2); | 30, 20, 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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| --- |
| void print(); |

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

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| --- |
| void List::print()  {  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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| bool replace(int index, ItemType item); |

(b) Implement the operation

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| bool List::replace(int index, ItemType item)  {  items[index-1] = item  } |