**Homework lecture 1**

**Sort**

1. Given a list of integer numbers: 2, 1, 10, 6, 3, 8, 7, 13, 20. Draw the steps to sort (ascending sort) the list by following methods:

* Selection sort

2, 1, 10, 6, 3, 8, 7, 13, 20

1, 2, 10, 6, 3, 8, 7, 13, 20

1, 2, 10, 6, 3, 8, 7, 13, 20

1, 2, 3, 6, 10, 8, 7, 13, 20

1, 2, 3, 6, 10, 8, 7, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

* Insertion sort

2, 1, 10, 6, 3, 8, 7, 13, 20

1, 2, 10, 6, 3, 8, 7, 13, 20

1, 2, 10, 6, 3, 8, 7, 13, 20

1, 2, 6, 10, 3, 8, 7, 13, 20

1, 2, 3, 6, 10, 8, 7, 13, 20

1, 2, 3, 6, 8, 10, 7, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

* Bubble sort

2, 1, 10, 6, 3, 8, 7, 13, 20

1, 2, 10, 6, 3, 8, 7, 13, 20

1, 2, 10, 6, 3, 8, 7, 13, 20

1, 2, 6, 10, 3, 8, 7, 13, 20

1, 2, 6, 3, 10, 8, 7, 13, 20

1, 2, 6, 3, 8, 10, 7, 13, 20

1, 2, 6, 3, 8, 7, 10, 13, 20

1, 2, 6, 3, 8, 7, 10, 13, 20

1, 2, 6, 3, 8, 7, 10, 13, 20

1, 2, 3, 6, 8, 7, 10, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

* Merge sort

2, 1, 10, 6, 3, 8, 7, 13, 20

2, 1, 10, 6, 3 || 8, 7, 13, 20

2, 1, 10 || 6, 3 || 8, 7 || 13, 20

2, 1 || 10 || 6 || 3 || 8 || 7 || 13 || 20

2, 1 || 10 || 6 || 3 || 8 || 7 || 13 || 20

2 || 1 || 10 || 6 || 3 || 8 || 7 || 13 || 20

1, 2 || 10 || 3, 6 || 7, 8 || 13,20

1, 2, 10 || 3, 6 || 7, 8 || 13,20

1, 2, 3, 6, 10 || 7, 8, 13, 20

1, 2, 3, 6, 7, 8, 10, 13, 20

* Quick sort

2, 1, 10, 6, 3, 8, 7, 13, 20

2, 1, 10, 6, 3, 8, 7, 13 || 20

2, 1, 10, 6, 3, 8, 7 || 13 || 20

2, 1, 6, 3 || 7 || 8, 10 || 13 || 20

2, 1 || 3 || 6 || 7 || 8 || 10 || 13 || 20

1 || 2 || 3 || 6 || 7 || 8 || 10 || 13 || 20

* Heap sort
* Radix sort

1. Same question for these lists:

* 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Selection sort

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Insertion sort

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Bubble sort

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Merge sort

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Quick sort

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* 10, 9, 8, 7, 6, 5, 4, 3, 2, 1

Selection sort

10, 9, 8, 7, 6, 5, 4, 3, 2, 1

1, 9, 8, 7, 6, 5, 4, 3, 2, 10

1, 2, 3, 7, 6, 5, 4, 8, 9, 10

1, 2, 3, 4, 6, 5, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Insertion sort

10, 9, 8, 7, 6, 5, 4, 3, 2, 1

1, 10, 9, 8, 7, 6, 5, 4, 3, 2

1, 2, 10, 9, 8, 7, 6, 5, 4, 3

1, 2, 3, 10, 9, 8, 7, 6, 5, 4

1, 2, 3, 4, 10, 9, 8, 7, 6, 5

1, 2, 3, 4, 5, 10, 9, 8, 7, 6

1, 2, 3, 4, 5, 6, 10, 9, 8, 7

1, 2, 3, 4, 5, 6, 7, 10, 9, 8

1, 2, 3, 4, 5, 6, 7, 8, 10, 9

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Bubble sort

10, 9, 8, 7, 6, 5, 4, 3, 2, 1

9, 10, 8, 7, 6, 5, 4, 3, 2, 1

9, 8, 10, 7, 6, 5, 4, 3, 2, 1

9, 8, 7, 10, 6, 5, 4, 3, 2, 1

9, 8, 7, 6, 10, 5, 4, 3, 2, 1

9, 8, 7, 6, 5, 10, 4, 3, 2, 1

9, 8, 7, 6, 5, 4, 10, 3, 2, 1

9, 8, 7, 6, 5, 4, 3, 10, 2, 1

9, 8, 7, 6, 5, 4, 3, 2, 10, 1

9, 8, 7, 6, 5, 4, 3, 2, 1, 10

…..

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Merge sort

10, 9, 8, 7, 6, 5, 4, 3, 2, 1

10, 9, 8, 7, 6 || 5, 4, 3, 2, 1

10, 9, 8 || 7, 6 || 5, 4, 3 || 2, 1

10, 9 || 8 || 7, 6 || 5, 4 || 3 || 2, 1

10 || 9 || 8 || 7 || 6 || 5 || 4 || 3 || 2 || 1

9, 10 || 8 || 6, 7 || 4, 5 || 3 || 1, 2

8, 9, 10 || 6, 7 || 3, 4, 5 || 1, 2

6, 7, 8, 9, 10 || 1, 2, 3, 4, 5

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Quick sort

10, 9, 8, 7, 6, 5, 4, 3, 2, 1

10, 9, 8, 7, 6, 5, 4, 3, 2 || 1

10, 9, 8, 7, 6, 5, 4, 3 || 2 || 1

10, 9, 8, 7, 6, 5, 4 || 3|| 2 || 1

10, 9, 8, 7, 6, 5 || 4 || 3|| 2 || 1

10, 9, 8, 7, 6 || 5 || 4 || 3|| 2 || 1

10, 9, 8, 7 || 6 || 5 || 4 || 3|| 2 || 1

10, 9, 8 || 7 || 6 || 5 || 4 || 3|| 2 || 1

10, 9 || 8 || 7 || 6 || 5 || 4 || 3|| 2 || 1

10 || 9 || 8 || 7 || 6 || 5 || 4 || 3|| 2 || 1

1 || 2 || 3 || 4 || 5 || 6 || 7 || 8 || 9 || 10

* 9, 10, 1, 2, 3, 4, 5, 6, 7, 8

Selection sort

9, 10, 1, 2, 3, 4, 5, 6, 7, 8

1, 10, 9, 2, 3, 4, 5, 6, 7, 8

1, 2, 9, 10, 3, 4, 5, 6, 7, 8

1, 2, 3, 10, 9, 4, 5, 6, 7, 8

1, 2, 3, 4, 9, 10, 5, 6, 7, 8

1, 2, 3, 4, 5, 10, 9, 6, 7, 8

1, 2, 3, 4, 5, 6, 9, 10, 7, 8

1, 2, 3, 4, 5, 6, 7, 10, 9, 8

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Insertion sort

9, 10, 1, 2, 3, 4, 5, 6, 7, 8

1, 9, 10, 2, 3, 4, 5, 6, 7, 8

1, 2, 9, 10, 3, 4, 5, 6, 7, 8

1, 2, 3, 9, 10, 4, 5, 6, 7, 8

1, 2, 3, 4, 9, 10, 5, 6, 7, 8

1, 2, 3, 4, 5, 9, 10, 6, 7, 8

1, 2, 3, 4, 5, 6, 9, 10, 7, 8

1, 2, 3, 4, 5, 6, 7, 9, 10, 8

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Bubble sort

9, 10, 1, 2, 3, 4, 5, 6, 7, 8

9, 10, 1, 2, 3, 4, 5, 6, 7, 8

9, 1, 10, 2, 3, 4, 5, 6, 7, 8

9, 1, 2, 10, 3, 4, 5, 6, 7, 8

9, 1, 2, 3, 10, 4, 5, 6, 7, 8

9, 1, 2, 3, 4, 10, 5, 6, 7, 8

9, 1, 2, 3, 4, 5, 10, 6, 7, 8

9, 1, 2, 3, 4, 5, 6, 10, 7, 8

9, 1, 2, 3, 4, 5, 6, 7, 10, 8

9, 1, 2, 3, 4, 5, 6, 7, 8, 10

1, 9, 2, 3, 4, 5, 6, 7, 8, 10

1, 2, 9, 3, 4, 5, 6, 7, 8, 10

1, 2, 3, 9, 4, 5, 6, 7, 8, 10

1, 2, 3, 4, 9, 5, 6, 7, 8, 10

1, 2, 3, 4, 5, 9, 6, 7, 8, 10

1, 2, 3, 4, 5, 6, 9, 7, 8, 10

1, 2, 3, 4, 5, 6, 7, 9, 8, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Merge sort

9, 10, 1, 2, 3, 4, 5, 6, 7, 8

9, 10, 1, 2, 3 || 4, 5, 6, 7, 8

9, 10, 1 || 2, 3 || 4, 5, 6 || 7, 8

9, 10 || 1 || 2 || 3 || 4, 5 || 6 || 7 || 8

9 || 10 || 1 || 2 || 3 || 4 || 5 || 6 || 7 || 8

9, 10 || 1 || 2, 3 || 4, 5 || 6 || 7 || 8

1, 9, 10 || 2, 3 || 4, 5, 6 || 7, 8

1, 2, 3, 9, 10 || 4, 5, 6, 7, 8

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Quick sort

9, 10, 1, 2, 3, 4, 5, 6, 7, 8

1, 2, 3, 4, 5, 6, 7 || 8 || 9, 10

1, 2, 3, 4, 5, 6 ||7 || 8 || 9 || 10

1, 2, 3, 4, 5|| 6 || 7 || 8 || 9 || 10

1, 2, 3, 4 || 5|| 6 || 7 || 8 || 9 || 10

1, 2, 3 || 4 || 5|| 6 || 7 || 8 || 9 || 10

1, 2 || 3 || 4 || 5|| 6 || 7 || 8 || 9 || 10

1 || 2 || 3 || 4 || 5|| 6 || 7 || 8 || 9 || 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

* 3, 4, 5, 6, 7, 8, 9, 10, 1, 2

Selection sort

3, 4, 5, 6, 7, 8, 9, 10, 1, 2

1, 4, 5, 6, 7, 8, 9, 10, 3, 2

1, 2, 5, 6, 7, 8, 9, 10, 3, 4

1, 2, 3, 6, 7, 8, 9, 10, 5, 4

1, 2, 3, 4, 7, 8, 9, 10, 5, 6

1, 2, 3, 4, 5, 8, 9, 10, 7, 6

1, 2, 3, 4, 5, 6, 9, 10, 7, 8

1, 2, 3, 4, 5, 6, 7, 10, 9, 8

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Insertion sort

3, 4, 5, 6, 7, 8, 9, 10, 1, 2

1, 3, 4, 5, 6, 7, 8, 9, 10, 2

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Bubble sort

3, 4, 5, 6, 7, 8, 9, 10, 1, 2

3, 4, 5, 6, 7, 8, 9, 1, 10, 2

3, 4, 5, 6, 7, 8, 9, 1, 2, 10

3, 4, 5, 6, 7, 8, 1, 9, 2, 10

3, 4, 5, 6, 7, 8, 1, 2, 9, 10

3, 4, 5, 6, 7, 1, 8, 2, 9, 10

3, 4, 5, 6, 7, 1, 2, 8, 9, 10

3, 4, 5, 6, 1, 7, 2, 8, 9, 10

3, 4, 5, 6, 1, 2, 7, 8, 9, 10

3, 4, 5, 1, 6, 2, 7, 8, 9, 10

3, 4, 5, 1, 2, 6, 7, 8, 9, 10

3, 4, 1, 5, 2, 6, 7, 8, 9, 10

3, 4, 1, 2, 5, 6, 7, 8, 9, 10

3, 1, 4, 2, 5, 6, 7, 8, 9, 10

3, 1, 2, 4, 5, 6, 7, 8, 9, 10

1, 3, 2, 4, 5, 6, 7, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Merge sort

3, 4, 5, 6, 7, 8, 9, 10, 1, 2

3, 4, 5, 6, 7 || 8, 9, 10, 1, 2

3, 4, 5 || 6, 7 || 8, 9, 10 || 1, 2

3, 4 || 5|| 6 || 7 || 8, 9 || 10 || 1 || 2

3 || 4 || 5|| 6 || 7 || 8 || 9 || 10 || 1 || 2

3, 4 || 5|| 6 || 7 || 8, 9 || 10 || 1 || 2

3, 4, 5|| 6, 7 || 8, 9, 10 || 1, 2

3, 4, 5, 6, 7 || 1, 2, 8, 9, 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Quick sort

3, 4, 5, 6, 7, 8, 9, 10, 1, 2

1 || 2 || 3, 4, 5, 6, 7, 8, 9, 10

1 || 2 || 3, 4, 5, 6, 7, 8, 9 || 10

1 || 2 || 3, 4, 5, 6, 7, 8 || 9 || 10

1 || 2 || 3, 4, 5, 6, 7 || 8 || 9 || 10

1 || 2 || 3, 4, 5, 6 || 7 || 8 || 9 || 10

1 || 2 || 3, 4, 5 || 6 || 7 || 8 || 9 || 10

1 || 2 || 3, 4 || 5 || 6 || 7 || 8 || 9 || 10

1 || 2 || 3 || 4 || 5 || 6 || 7 || 8 || 9 || 10

1, 2, 3, 4, 5, 6, 7, 8, 9, 10

1. Write a program to sort (ascending sort) the list by following methods:

* Selection sort
* Insertion sort
* Bubble sort
* Merge sort
* Quick sort
* Heap sort
* Radix sort