Lab-01

Problem-01

Output:

```
Enter how many numbers: 5
Enter the numbers:  43 24 9 12 10
Average: 19.6
```

Problem-02

Output:

```
Enter how many number:5
Enter the numbers:34 56 23 10 5
Enter the search item:11
Not Found
```

Problem-03

Output:

```
Enter how many numbers: 5
Enter the numbers: 34 23 11 98 5
After sorting:5 11 23 34 98
```

Lab-02

Problem-01

Output:

```
How many number for you want to calculate the median:5
Enter the elements:34 11 56 88 1
Before sorting
34 11 56 88 1
After sorting
1 11 34 56 88
Median number is 34
```

Problem-02

Output:

```
Enter the number of elements:5
Enter n elements:10 12 34 45 55
Array elements are:10 12 34 45 55
Enter item to insert: 13
Enter position to insert: 3
Array elements are:10 12 34 13 45 55
```

Problem-3

Output:

```
Enter the number of elements:5
Enter n elements:1 4 2 7 9
Array elements are:1 4 2 7 9
Enter the position to delete:3
Array elements are:1 4 2 9
```

Problem-4

Output:

```
Enter the Student ID: 1984
Enter the Student Name: Shaon
Enter the Student Marks: 87
_______Students Details_______
Student name: Shaon
Student id: 1984
Student marks: 87
```

Lab-03

Problem-01

Output:

```
LinkedList elements: 10 20 30
LinkedList elements: 5 10 20 30
LinkedList elements: 5 10 15 20 30
```

Problem-02

Output:

```
Linked List elements: 10  20  30  40  50  NULL
Node deleted from beginning
Linked List elements: 20  30  40  50  NULL
Node deleted from end.
Linked List elements: 20  30  40  NULL
Node deleted from position 2.
Linked List elements: 20  40  NULL
Position is beyond list length. Nothing to delete.
Linked List elements: 20  40  NULL
Node deleted from beginning
Node deleted from beginning
Linked List elements: NULL
List is already empty
```

Lab-04

Problem-01

Output:

```
Circular Linked List elements: 10 20 30
Circular Linked List elements: 5 10 20 30
Circular Linked List elements: 5 10 15 20 30
```

Problem-02

Output:

```
Circular Linked List elements: 10 20 30
Node deleted from beginning.
Circular Linked List elements: 20 30
Node deleted from end.
Circular Linked List elements: 20
Position is beyond list length. Nothing to delete.
Circular Linked List elements: 20
Node deleted from beginning (only node).
List is empty. Nothing to delete.
Circular Linked List is Empty.
List is empty. Nothing to delete.
```

Problem-03

Output:

1.

```
--- Stack Operations Menu ---
1. Push
2. Pop
3. Display Stack
4. Exit
Enter your choice: 1
Enter value to push: 10
10 pushed into the stack.

--- Stack Operations Menu ---
1. Push
2. Pop
3. Display Stack
4. Exit
Enter your choice: 1
Enter value to push: 20
20 pushed into the stack.
```

2.

```
--- Stack Operations Menu ---
1. Push
2. Pop
3. Display Stack
4. Exit
Enter your choice: 1
Enter value to push: 30
30 pushed into the stack.

--- Stack Operations Menu ---
1. Push
2. Pop
3. Display Stack
4. Exit
Enter your choice: 3
Stack elements are: 30 20 10

--- Stack Operations Menu ---
1. Push
2. Pop
3. Display Stack
4. Exit
Enter your choice: 2
30 popped from the stack.
```

3.

```
--- Stack Operations Menu ---
1. Push
2. Pop
3. Display Stack
4. Exit
Enter your choice: 2
20 popped from the stack.

--- Stack Operations Menu ---
1. Push
2. Pop
3. Display Stack
4. Exit
Enter your choice: 4
Exiting program.
```

Problem-04

Output:

```
Enter Infix Expression (e.g., A+B*(C^D-E)): A+B*(C^D-E)-F
Postfix Expression: ABCD^E-*+F-
```

Lab-5

Problem-01

Output:

1.

```
1. Insert
2. Delete
3. Display
4. Exit
Enter choice: 1
Enter item to insert: 12

1. Insert
2. Delete
3. Display
4. Exit
Enter choice: 1
Enter item to insert: 23

1. Insert
2. Delete
3. Display
4. Exit
Enter choice: 1
Enter item to insert: 34
```

2.

```
1. Insert
2. Delete
3. Display
4. Exit
Enter choice: 3
Queue elements: 12 23 34

1. Insert
2. Delete
3. Display
4. Exit
Enter choice: 2

1. Insert
2. Delete
3. Display
4. Exit
Enter choice: 3
Queue elements: 23 34

1. Insert
2. Delete
3. Display
4. Exit
Enter choice: 4
Exiting program.
```

Problem-02

Output:

Problem-03

Output:

```
Enter the array size: 6
Enter the elements: 34 11 90 23 55 44
Sorted elements are:
11 23 34 44 55 90
```

Lab-6

Problem-01

Output:

```
Enter the array size: 6
Enter the elements: 12 23 32 1 10 27
Sorted elements are:
1 10 12 23 27 32
```

Problem-02

Output:

```
After sorting:1 3 12 23 45 78 94
```

Lab-7

Problem-01

Output:

```
After sorting:1 4 4 23 56 56 93
```

Lab-8

Problem-01

Output:

```
Create Binary Tree:
Enter the data(-1 for no node):10
Enter left child of 10,
Enter the data(-1 for no node):5
Enter left child of 5,
Enter the data(-1 for no node):1
Enter left child of 1,
Enter the data(-1 for no node):-1
Enter right child of 1,
Enter the data(-1 for no node):-1
Enter right child of 5,
Enter the data(-1 for no node):7
Enter left child of 7,
Enter the data(-1 for no node):-1
Enter right child of 7,
Enter the data(-1 for no node):-1
Enter right child of 10,
Enter the data(-1 for no node):15
Enter left child of 15,
Enter the data(-1 for no node):12
Enter left child of 12,
Enter the data(-1 for no node):-1
Enter right child of 12,
Enter the data(-1 for no node):-1
Enter right child of 15,
Enter the data(-1 for no node):18
Enter left child of 18,
Enter the data(-1 for no node):-1
Enter right child of 18,
Enter the data(-1 for no node):-1
1 5 7 10 12 15 18
```

Problem-02

Output:

```
Enter how many nodes want to insert: 6
12 10 23 45 30 15

10 12 15 23 30 45
```

Problem-03

Output:

```
How many nodes:6
Enter the nodes:10 2 4 12 16 13
After inserting:2 4 10 12 13 16
Enter the search key:5
NOT FOUND
```

Problem-04

Output:

```
How many values do you want to insert in the BST? 5
Enter 5 values:
12 10 2 15 8

Inorder Traversal of BST (Before Deletion): 2 8 10 12 15

Enter value to delete from BST: 8

Inorder Traversal of BST (After Deletion): 2 10 12 15
```

Lab-9

Problem-01

Output:

```
Enter number of vertices: 6
Enter number of edges: 7
Is the graph directed? (1 = Yes, 0 = No): 0
Enter edges (u v):
0 1
0 2
1 3
1 4
2 4
3 5
4 5
DFS Traversal starting from vertex 0: 0 1 3 5 4 2
BFS Traversal starting from vertex 0: 0 1 2 3 4 5
```

Problem-02

Output:

```
Enter number of vertices: 6
Enter number of edges: 9
Enter edges (u v weight):
0 1 4
0 2 4
1 2 2
1 0 4
2 0 4
2 3 3
2 5 2
2 4 4
3 4 2

Edges in Minimum Spanning Tree:
1 - 2 : 2
2 - 5 : 2
3 - 4 : 2
2 - 3 : 3
0 - 1 : 4
Total weight of MST: 13
```

Problem-03

Output:

```
Enter number of vertices: 6
Enter number of edges: 9
Enter edges (u v weight):
0 1 4
0 2 4
1 2 2
1 0 4
2 0 4
2 3 3
2 5 2
2 4 4
3 4 3

Edges in MST:
0 - 1 : 4
1 - 2 : 2
2 - 3 : 3
3 - 4 : 3
2 - 5 : 2
Total weight of MST: 14
```

Problem-04

Output:

```
Enter number of vertices: 6
Enter number of edges: 9
Is the graph directed? (y/n): y
Enter edges (from to weight):
0 1 1
0 2 4
1 2 4
1 3 2
1 4 7
2 4 3
3 5 1
4 5 1
3 4 2
Enter source vertex: 0
Shortest distances from source 0:
To 0 : 0
To 1 : 1
To 2 : 4
To 3 : 3
To 4 : 5
To 5 : 4
```

Problem-05

Output:

```
Enter number of vertices: 5
Enter number of edges: 5
Is the graph directed? (1 = Yes, 0 = No): 0
Enter edges (u v):
0 1
1 2
2 3
3 4
4 1
Cycle detected in the graph.
```