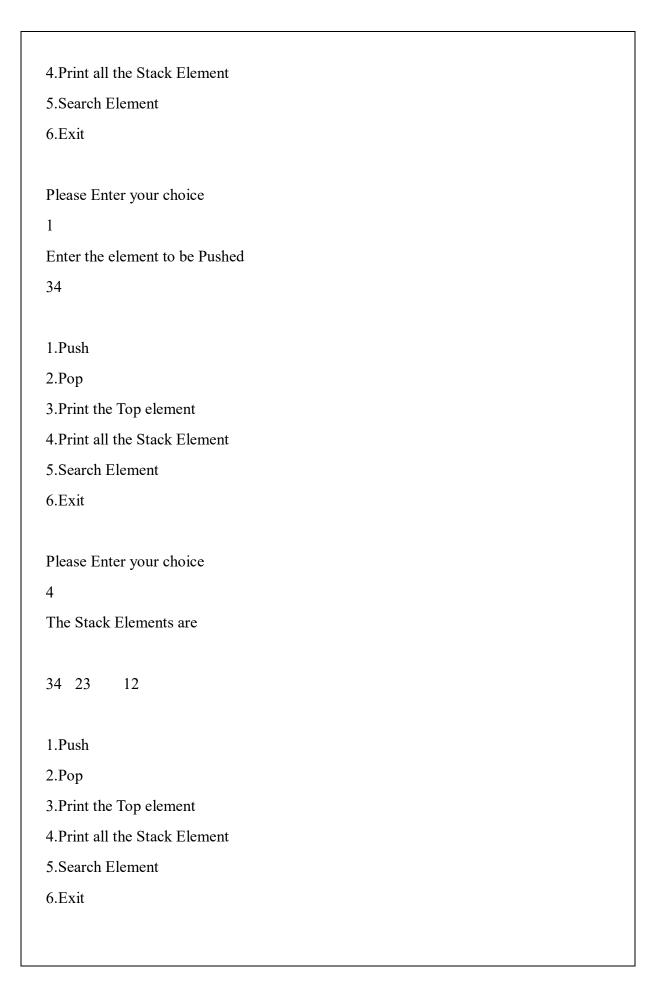**OUTPUT:**

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

Please Enter your choice

1

Enter the element to be Pushed

12

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

Please Enter your choice

1

Enter the element to be Pushed

23

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

Please Enter your choice

1

Enter the element to be Pushed

34

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

Please Enter your choice

4

The Stack Elements are

34   23   12

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

Please Enter your choice

3

The Top most Element of the Stack is 34

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

Please Enter your choice

2

34 Element Removed

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

Please Enter your choice

5

Enter the item to be searched

12

12 is Included in the stack

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

Please Enter your choice

5

Enter the item to be searched

67

Element not found

1.Push

2.Pop

3.Print the Top element

4.Print all the Stack Element

5.Search Element

6.Exit

OUTPUT:

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:1

Enter the data to be inserted at the beginning:

12

12 inserted at the beginning.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:2

Enter the data to be inserted at the end:

34

34 inserted at the end.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:3

Enter the data to be inserted :

2

Enter the position to be inserted :

2

2 inserted.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:4

12

2

34

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:1

Enter the data to be inserted at the beginning:

45

45 inserted at the beginning.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:5

Deleted 45 from the beginning.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:6

Deleted 34 from the end.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:7

Enter the position to be deleted:

2

Deleted 2 from the end.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:4

12

OUTPUT:
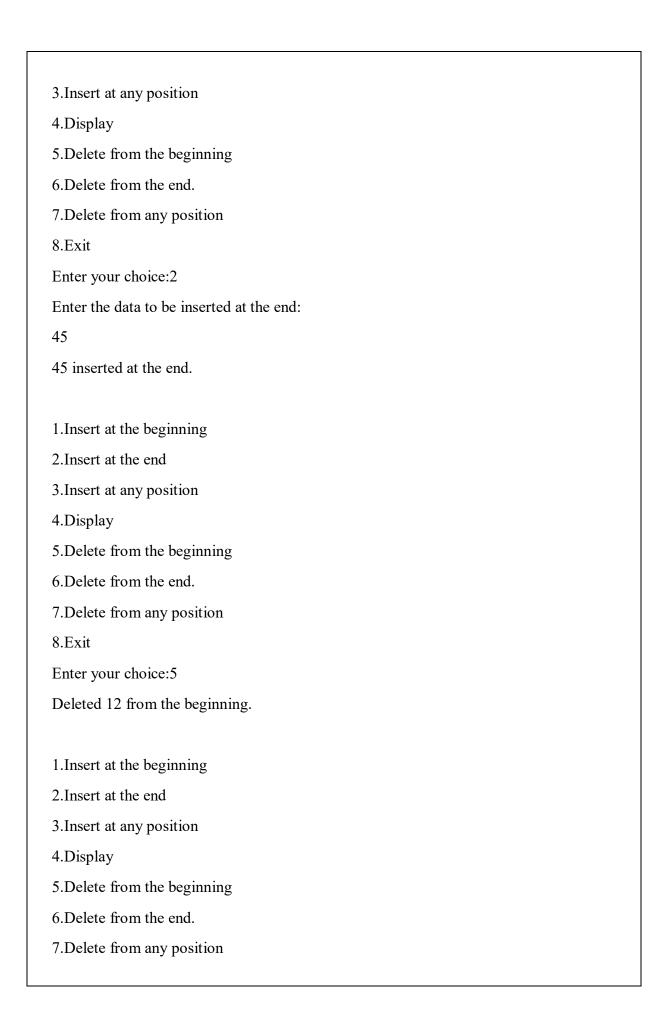
1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:1

Enter the data to be inserted at the beginning:

12

12 inserted at the beginning.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:2

Enter the data to be inserted at the end:

34

34 inserted at the end.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:3

Enter the data to be inserted :

23

Enter the position to be inserted :

2

23 inserted.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:4

12

23

34

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:2

Enter the data to be inserted at the end:

45

45 inserted at the end.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:5

Deleted 12 from the beginning.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:6

Deleted 45 from the end.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:7

Enter the position to be deleted:

2

Deleted 34 from the end.

1.Insert at the beginning

2.Insert at the end

3.Insert at any position

4.Display

5.Delete from the beginning

6.Delete from the end.

7.Delete from any position

8.Exit

Enter your choice:4

23

OUTPUT:

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:1

enter the value to be inserted :12

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:1

enter the value to be inserted :23

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:1

enter the value to be inserted :10

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:1

enter the value to be inserted :7

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:4

preorder traversal:

12   10   7   23

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:5

inorder traversal:

7   10   12   23

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:6

postorder traversal:

7   10   23   12

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

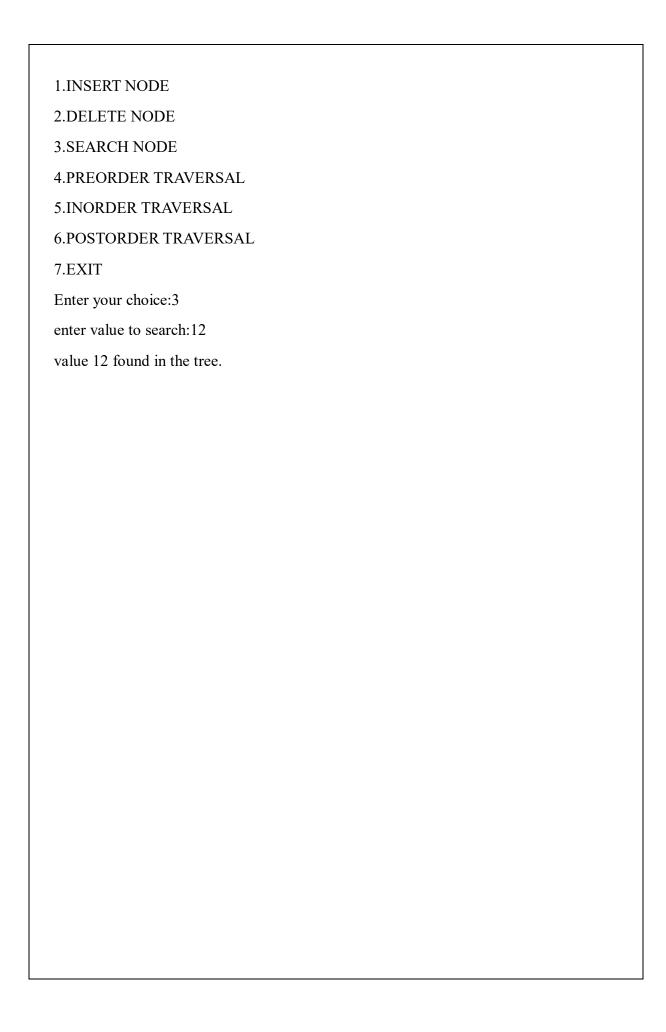5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:2

enter the value to delete:7

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:3

enter value to search:7

value 7 not found in the tree

1.INSERT NODE

2.DELETE NODE

3.SEARCH NODE

4.PREORDER TRAVERSAL

5.INORDER TRAVERSAL

6.POSTORDER TRAVERSAL

7.EXIT

Enter your choice:3

enter value to search:12

value 12 found in the tree.

OUTPUT:

ENTER THE SIZR OF THE QUEUE: 5

CIRCULAR QUEUE MENU

1. Enqueue

2. Dequeue

3. Search Element

4. Display

5. Exit

Enter your choice: 1

Enter the element to enqueue: 12

12 is Inserted

CIRCULAR QUEUE MENU

1. Enqueue

2. Dequeue

3. Search Element

4. Display

5. Exit

Enter your choice: 1

Enter the element to enqueue: 23

23 is Inserted

CIRCULAR QUEUE MENU

1. Enqueue

2. Dequeue

3. Search Element

4. Display

5. Exit

Enter your choice: 1

Enter the element to enqueue: 34

34 is Inserted

CIRCULAR QUEUE MENU

1. Enqueue

2. Dequeue

3. Search Element

4. Display

5. Exit

Enter your choice: 4

QUEUE ELEMENTS ARE: 12 23 34

CIRCULAR QUEUE MENU

1. Enqueue

2. Dequeue

3. Search Element

4. Display

5. Exit

Enter your choice: 2

12 ELEMENT IS DELETED FROM THE QUEUE

CIRCULAR QUEUE MENU

1. Enqueue

2. Dequeue

3. Search Element

4. Display

5. Exit

Enter your choice: 3

Enter the element to search: 23

23 found at position 1

CIRCULAR QUEUE MENU

1. Enqueue

2. Dequeue

3. Search Element

4. Display

5. Exit

Enter your choice: 3

Enter the element to search: 12

12 not found in the queue

OUTPUT:

Enter Universal Set Size (max 20): 5

Enter 5 elements for the Universal Set:

Element 1: 12

Element 2: 2

Element 3: 3

Element 4: 4

Element 5: 5

Enter Set A Size (max 5): 3

Enter 3 elements (must be in the Universal Set):

Element 1: 1

Element 2: 2

Element 3: 3

Enter Set B Size (max 5): 3

Enter 3 elements (must be in the Universal Set):

Element 1: 2

Element 2: 3

Element 3: 4

Set A Bit String: {1, 1, 1, 0, 0}

Set B Bit String: {0, 1, 1, 1, 0}

Choose an operation:

1. Union of A and B

2. Intersection of A and B

3. Difference (A - B)

4. Difference (B - A)

5. Exit

Enter your choice: 1

Union: {1, 2, 3, 4}

Union Bit String{1, 1, 1, 1, 0}

Choose an operation:

1. Union of A and B

2. Intersection of A and B

3. Difference (A - B)

4. Difference (B - A)

5. Exit

Enter your choice: 2

Intersection: {2, 3}

{0, 1, 1, 0, 0}

Choose an operation:

1. Union of A and B

2. Intersection of A and B

3. Difference (A - B)

4. Difference (B - A)

5. Exit

Enter your choice: 3

Difference (A - B): {1}

{1, 0, 0, 0, 0}

Choose an operation:

1. Union of A and B

2. Intersection of A and B

3. Difference (A - B)

4. Difference (B - A)

5. Exit

Enter your choice: 4

Difference (B - A): {4}

{0, 0, 0, 1, 0}

OUTPUT:

1. Make Set

2. Display set representatives

3. Union

4. Find Set

5. Display all sets

6. Exit

Enter your choice: 1

Enter the Element to Make a Set: 12

1. Make Set

2. Display set representatives

3. Union

4. Find Set

5. Display all sets

6. Exit

Enter your choice: 1

Enter the Element to Make a Set: 23

1. Make Set

2. Display set representatives

3. Union

4. Find Set

5. Display all sets

6. Exit

Enter your choice: 1

Enter the Element to Make a Set: 34

1. Make Set

2. Display set representatives

3. Union

4. Find Set

5. Display all sets

6. Exit

Enter your choice: 2

Set Representatives: 12 23 34

1. Make Set

2. Display set representatives

3. Union

4. Find Set

5. Display all sets

6. Exit

Enter your choice: 5

Disjoint Sets:

{ 12 }

{ 23 }

{ 34 }

1. Make Set

2. Display set representatives

3. Union

4. Find Set

5. Display all sets

6. Exit

Enter your choice: 3

Enter first element: 12

Enter second element: 23

1. Make Set

2. Display set representatives

3. Union

4. Find Set

5. Display all sets

6. Exit

Enter your choice: 5

Disjoint Sets:

{ 12, 23 }

{ 34 }

1. Make Set

2. Display set representatives

3. Union

4. Find Set

5. Display all sets

6. Exit

Enter your choice: 4

Enter the element to find: 23

The representative of 23 is 12

OUTPUT:

*** BFS, DFS, and Topological Sort Implementation ***

Enter the number of vertices: 6

Enter the number of edges: 5

Enter edge 1 (source destination): 0 1

Enter edge 2 (source destination): 0 4

Enter edge 3 (source destination): 4 5

Enter edge 4 (source destination): 1 2

Enter edge 5 (source destination): 2 3

Menu:

1. Display Graph

2. Perform DFS Traversal

3. Perform BFS Traversal

4. Perform Topological Sort

5. Exit

Enter your choice: 1

Graph Representation (Adjacency List):

Vertex 0: 4 -> 1 -> NULL

Vertex 1: 2 -> NULL

Vertex 2: 3 -> NULL

Vertex 3: NULL

Vertex 4: 5 -> NULL

Vertex 5: NULL

Menu:

1. Display Graph

2. Perform DFS Traversal

3. Perform BFS Traversal

4. Perform Topological Sort

5. Exit

Enter your choice: 2

Enter start vertex for DFS: 1

DFS starting from vertex 1: 1 2 3 0 4 5

Menu:

1. Display Graph

2. Perform DFS Traversal

3. Perform BFS Traversal

4. Perform Topological Sort

5. Exit

Enter your choice: 3

Enter start vertex for BFS: 0

BFS starting from vertex 0: 0 4 1 5 2 3

Menu:

1. Display Graph

2. Perform DFS Traversal

3. Perform BFS Traversal

4. Perform Topological Sort

5. Exit

Enter your choice: 4

Topological Sort: 0 1 2 3 4 5

OUTPUT:

 Enter the number of vertices: 7

Enter edge 0(0 0) to quit : 0 1

Enter edge 1(0 0) to quit : 1 2

Enter edge 2(0 0) to quit : 2 0

Enter edge 3(0 0) to quit : 0 3

Enter edge 4(0 0) to quit : 3 4

Enter edge 5(0 0) to quit : 4 5

Enter edge 6(0 0) to quit : 5 6

Enter edge 7(0 0) to quit : 6 4

Enter edge 8(0 0) to quit : 0 0

Strongly connected component 1:

2 1 0

Strongly connected component 2:

3

Strongly connected component 3:

4 6 5

OUTPUT:

Enter the number of nodes: 6

Enter the adjacency matrix:

0 3 0 5 0 1

3 0 6 0 0 0

0 6 0 2 0 0

5 0 2 0 4 0

0 0 0 4 0 8

1 0 0 0 8 0

Edge 1: (1 6) cost: 1

Edge 2: (1 2) cost: 3

Edge 3: (1 4) cost: 5

Edge 4: (4 3) cost: 2

Edge 5: (4 5) cost: 4

Minimum cost: 15

OUTPUT:

Enter the number of nodes: 6

Enter the adjacency matrix:

0 3 0 5 0 1

3 0 6 0 0 0

0 6 0 2 0 0

5 0 2 0 4 0

0 0 0 4 0 8

1 0 0 0 8 0

Edges in the Minimum Spanning Tree:

Edge 1: (0, 5) cost: 1

Edge 2: (2, 3) cost: 2

Edge 3: (0, 1) cost: 3

Edge 4: (3, 4) cost: 4

Edge 5: (0, 3) cost: 5

Minimum cost: 15