**Date: 19.04.2024**

**BOUNDARY CONDITIONS:**

**Main function conditions: (Sample)**

1. Dimension of the tree:

Enter the value of k (number of dimensions):

Sample input: 3

1. Menu-driven part of the code:

Menu:

1. Insert a point

2. Search for a point

3. Delete a point

4. Exit

Enter your choice:

**Insertion cases:**

1. Insert a point into the KD tree:

**Sample input 1:**

Enter the point to insert (each point should have 3 coordinates): 1 2 3

**Sample input 2:** (negative coordinates)

Enter the point to insert (each point should have 3 coordinates): -3 -4 -5

**Sample input 3:** (zero coordinates)

Enter the point to insert (each point should have 3 coordinates): 0 0 0

**Sample output for all three cases:**

Point inserted successfully.

-Non-integer coordinates

**Sample input 4:**

Enter the point to insert (each point should have 3 coordinates): a b c

**Sample output:**

Invalid input format.

**-**More than K number of inputs

**Sample input 5:**

Enter the point to insert (each point should have 3 coordinates): 3 4 5 6

**Sample output:**

Invalid input format.

**Search cases:**

1. Search for a point in the KD tree:

- A point that exists in the tree

**Sample input 1:**

Enter the point to search (each point should have 2 coordinates): 1 2 3

**Sample output:**

Point found.

- A point that doesn’t exist in the tree

**Sample input 2:**

Enter the point to search (each point should have 2 coordinates): 4 5 3

**Sample output:**

Point not found.

- Non-integer coordinates

**Sample input 3:**

Enter the point to search (each point should have 3 coordinates): a b c

**Sample output:**

Invalid input format.

**-**Tree is empty

**Sample input 4:**

Enter the point to delete (each point should have 3 coordinates): 2 3 5

**Sample output:**

Tree is empty. Cannot perform deletion.

**-**More than K number of inputs

**Sample input 5:**

Enter the point to search (each point should have 3 coordinates): 3 4 5 6

**Sample output:**

Invalid input format.

**Deletion cases:**

1. Delete a point from the KD tree:

-A point that exists in the tree

**Sample input 1**:

Enter the point to delete (each point should have 2 coordinates): 1 2 3

**Sample output:**

Point deleted successfully.

-A point that doesn’t exist in the tree

**Sample input 2**:

Enter the point to delete (each point should have 2 coordinates): 5 6 7

**Sample output:**

Point not found

No deletion performed.

-Non-integer coordinates

**Sample input 3:**

Enter the point to delete (each point should have 3 coordinates): a b c

**Sample output:**

Invalid input format.

**-**Tree is empty

**Sample input 4:**

Enter the point to delete (each point should have 3 coordinates): 2 3 5

**Sample output:**

Tree is empty. Cannot perform deletion.

**-**More than K number of inputs

**Sample input 5:**

Enter the point to delete (each point should have 3 coordinates): 3 4 5 6

**Sample output:**

Invalid input format.

**Exit case:**

1. Exit the program:

**Sample output:**

Exiting…