ADS PROJECT REPORT

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Function prototypes:

```
1. int main(int argc, char *argv[])
```

Takes the input from the command line parses it line by line and calls the appropriate functions according to the input.

```
2. void search(Node *curNode,double k,double l)
```

If the input contains 2 doubles, then the search functions searches the range between the two keys and displays the corresponding value.

```
3. void search(Node *curNode,double k)
```

If the input contains only one double, the search function searches the tree and returns the corresponding value. It returns null the value isn’t found.

```
4. void insertNode(Node *curNode, double k,string val)
```

This searches the tree from top to bottom to find the appropriate leaf node and appends the value. If the number of nodes in a leaf exceeds the order of the tree, it calls the “splitNode” function which divides the leaf node and propagates up the tree.

```
5. void splitNode(Node *curNode)
```

This function is called when the capacity for a particular node (leaf or internal) has been exceeded. This redistributes the keys and children for an internal node, and key, value pairs for leaf sets. It propagates upwards and checks if the redistribution of nodes has created a conflict in the upper nodes.

```
6. bool childSort(const Node* a, const Node* b)
```

This custom sort function is called to sort the children nodes, in the **splitNode** function when the keys in the internal node are being sorted to maintain the proper order in the tree.

```
7. bool keySort(const Node*a, const Node* b)
```

This custom sort function is called to sort the keys, in the **splitNode** function when the capacity of the node has been exceeded and the proper order has to be established before splitting the nodes.

PROGRAM STRUCTURE:

- The program stars from main and parses arguments line by line from the file
- If the corresponding function is insert it calls the **insertNode** function.
- Insert function calls **splitNode** if capacity has been exceeded in the leaf.
- **splitNode** calls itself and propagates upwards to resolve any issues.
- **search** is called to search for the appropriate input.