**REPORT ASSIGNMENT 2**

**STRUCTURE FEATURES:**

**Binary tree:**

* A separate node class was defined for the nodes having the x coordinate , y coordinate and name
* The Binary Tree has been made with name of the city as key
* It is accessed with the name of the city in order to get the location details of the city.
* A separate copy pointer is made in order to include duplicate names
* The insertion and removal functions have defined with pointers to effectively work
* A find function is defined in order to facilitate the searching of the city by its name.

**PR Quadtree:**

* Three separate node classes have been defined
* A base class and two child classes (leaf and internal) have been defined where the child classes have been derived from the base class
* The concept of inheritance has been used.
* Dynamic initialization of pointers has been done quite often in the functions of the quadtree.
* A separate getnode function has been defined in order to get the new x,y coordinates and range for the internal nodes.
* A function is defined that gives the location of the input coordinate depending on the position of the internal node

**Precautions in the code:**

* The ranges of each of the input coordinates have been defined in the function
* Any input that is out of the range is shown as an invalid input in the project.
* The corner conditions of the coordinate system are also taken into consideration while designing the code.
* The overflow of the int is taken into consideration while defining the search function