**PROJECT REPORT**

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Wayne Enterprises is developing a new city and they are constructing many buildings. This project is the software that can help them keep track of all buildings under construction in this new city.

Description of files in this project:

**Building.java**

The building class has the following attributes:

1. Building Number
2. Execution Time
3. Total Time

This class has attributes of the building class along with getters and setters.

**MinHeap.java**

This is the class for constructing a min heap of buildings.

This has the following Methods:

1. Insert(Building) – Inserts building into min heap
2. RemoveMin(Building) – Removes the top most node of min heap
3. MeldMinHeap() – Meld the min heap after insertion and remove Min
4. MinHeap() – Construct the Min heap
5. SwapBuildings(building1, building2) – Swap the locations of two buildings.
6. Helper functions to getParent, getLeftChild, getRightChild, size of the min heap and first element in the min heap
7. Print () – To display the min heap

**MinHeapTest.java**

This is a sample test file for the MinHeap class.

**RedBlackNode.java**

This class is used to create a red black node with the following attributes:

1. Building
2. Left Child
3. Right Child
4. Parent
5. Color of node

**RedBlackTree.java**

This class is used to construct the red black tree. It has the following functions:

1. CreateNode(Building) – Create a red black node
2. InsertNode(Building) – Insert a building node into red black tree
3. deleteNode(Building) – Delete a node
4. balance() – Balance tree after insertion and deletion
5. search(building) – Search for a building
6. SarchInRange(building1, building2) - Search for buildings in a range.
7. rotateLeft()- Left Rotation
8. rotateRight() – Right rotation
9. Display() – Print red black tree

**RedBlackTreeTest.java**

This is a sample test file for Red Black Tree.

**InputFileParser.java**

This file is used to parse the input files

**risingCity.java**

This is the main class that reads input from files and directs the output into another file.

It has the following functions:

1. WorkOnBuildings() – Work on the buildings for a given amount of time.
2. Update() – Update Min heap and red black tree
3. Main – All functions are called here.
4. PrintOutput() – Prints the output of the project