# Week 10 In-Class Exercise: Red-Black Tree Experiment

Using the simulation we saw on Monday, familiarize yourself with the operations that maintain the “balance” in the Red-Black tree. Try to predict what will happen in the simulation BEFORE it happens, and fill out the following table.

Insert the first 25 prime numbers into the tree **in the order given in the left-most column** of the table under “Insert Value”. Then, *before you insert and observe what happens*, try to predict where the node will go, and to ***predict what the tree will do, if anything, to rebalance***. Pick the operations from the following list and write them in the “Operations” column of the table. NOTE: more than one operation may occur!

* Simple insertion
* Push black down from grandparent
* Re-color the root
* Rotate left
* Rotate right
* Push black up from child

|  |  |
| --- | --- |
| **Insert Value** | **Operations [use more than one if needed]** |
| 41 | Simple insert |
| 17 | Simple insert |
| 67 | Simple insert |
| 5 | Push black down from grandparent; Re-color the root |
| 11 | Rotate left; Rotate right; Push black up from child |
| 23 | Push black down from grandparent |
| 97 | Simple insert |
| 53 | Simple insert |
| 59 | Push black down from grandparent |
| 29 | Rotate left; Push black up |
| 2 | Simple insert |
| 13 | Push black down from grandparent; Push black down from grandparent; Re-color root |
| 7 | Simple insert |
| 83 | Simple insert |
| 47 | Simple insert |
| 71 | Rotate right; Push black up from child |
| 61 | Push black down from grandparent |
| 19 | Simple insert |
| 79 | Push black down from grandparent |
| 89 | Simple insert |
| 3 | Push black down from grandparent |
| 31 | Simple insert |
| 43 | Simple insert |
| 37 | Rotate left; Push black up |