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CS 6301.011 Implementation of Data Structures and Algorithm

Short project 9 Minimum Spanning Tree

**To Run the Program:**

Store the 3 files in a folder : BinaryHeap.java, Graph.java and MST.java

Open Terminal in the location of the folder

Run the following commands:

Javac MST.java

Java MST mst-50-140-84950.txt

For larger files, run the code on csgrads1.utdallas.edu

**Report of the two algorithms**

Running the test cases given:

1. mst-50-140-84950.txt

|  |  |
| --- | --- |
| Prim | Borovka |
| Prim2: indexed heaps  84950  Time: 6 msec.  Memory: 1 MB / 123 MB. | Boruvka  84950  Time: 8 msec.  Memory: 1 MB / 123 MB. |

1. mst-200-580-153534.txt

|  |  |
| --- | --- |
| Prim | Borovka |
| Prim2: indexed heaps  153534  Time: 9 msec.  Memory: 3 MB / 123 MB. | Boruvka  153534  Time: 12 msec.  Memory: 3 MB / 123 MB. |

1. mst-10k-30k-1085305.txt

|  |  |
| --- | --- |
| Prim | Borovka |
| Prim2: indexed heaps  1085305  Time: 161 msec.  Memory: 10 MB / 155 MB. | Boruvka  1085305  Time: 602 msec.  Memory: 15 MB / 155 MB. |

For 10,000 nodes, 1 Million edges

Sum of weights: 34614

|  |  |
| --- | --- |
| Prim | Borovka |
| Prims2: Indexed heaps  Time: 157 msec.  Memory: 563 MB / 621 MB. | Boruvka  Time: 952 msec.  Memory: 570 MB / 621 MB. |

100,000 nodes, 30 Million edges

Sum of weights: 154723

|  |  |
| --- | --- |
| Prim | Borovka |
| Prims2: Indexed heaps  Time: 4464 msec.  Memory: 4295 MB / 12237 MB. | Boruvka  Time: 65128 msec.  Memory: 4499 MB / 12235 MB. |

100,000 nodes, 300 Million edges

|  |  |
| --- | --- |
| Prim | Borovka |
| Prims2: Indexed heaps  Time: 24003 msec.  Memory: 22356 MB. | Boruvka  Time: 105954 msec.  Memory: 24652 MB |

1Million nodes, 300 Million edges

|  |  |
| --- | --- |
| Prim | Borovka |
| Prims2: Indexed heaps  Time: 25926 msec.  Memory: 24476 MB | Boruvka  Time: 122512 msec.  Memory: 26596 MB |