CS566 – Programming Assignment 1

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**Table. Running Times for Different Input Sizes**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| n | 10000 | 20000 | 30000 | 40000 | 50000 | 60000 | 70000 | 80000 | 90000 | 100000 |
| Running time (average elapsed time) | 12.58 | 26.51 | 40.26 | 53.01 | 74.72 | 84.57 | 96.25 | 111.93 | 131.61 | 146.25 |

**Programing running result**

For 10000 elements, the average elapsed time is 12.583398819

For 20000 elements, the average elapsed time is 26.508641243

For 30000 elements, the average elapsed time is 40.2642965317

For 40000 elements, the average elapsed time is 53.0097007751

For 50000 elements, the average elapsed time is 74.7201442719

For 60000 elements, the average elapsed time is 84.5684051514

For 70000 elements, the average elapsed time is 96.2537288666

For 80000 elements, the average elapsed time is 111.930561066

For 90000 elements, the average elapsed time is 131.614017487

For 100000 elements, the average elapsed time is 146.248435974

**Chart. Running time for Different Input Sizes**

**Discussion**

Base on the running time analysis and the chart, the algorithm of build-max-heap is correlated with the input size in linear relation.

**Compilation Instructions**

The python version is 2.7, all the input files are put into a separate input folder. The program will read the input files during compilation.

Steps:

1. Unzip [Shi\_Hanxiong\_p1.zip] to folder [Shi\_Hanxiong\_p1]
2. $cd Shi\_Hanxiong\_p1/ProgrammingAssignment1
3. $python BuildMaxHeap.py