**Assignment – 4**

**Running time constants when input data is random:**

1. **Insertion sort:**

|  |  |  |
| --- | --- | --- |
| **Input Size** | **Running Time (μs)** | **Value of A** |
| 10001 | 85959 | 8.596\*10-4 |
| 50001 | 2159734 | 8.638\*10-4 |
| 100001 | 8620462 | 8.620\*10-4 |
| 200001 | 34632832 | 8.658\*10-4 |
| 300001 | 76644279 | 8.516\*10-4 |
| 380001 | 123204379 | 8.532\*10-4 |
|  | **Average Value of A** | **8.593\*10-4** |

1. **Merge Sort:**

|  |  |  |
| --- | --- | --- |
| **Input Size** | **Running Time (μs)** | **Value of A** |
| 10001 | 1852 | 0.0139 |
| 100001 | 21832 | 0.0131 |
| 200001 | 47416 | 0.0135 |
| 300001 | 73282 | 0.0134 |
| 400001 | 99212 | 0.0133 |
| 499001 | 125798 | 0.0133 |
|  | **Average Value of A** | **0.0134** |

1. **Heap Sort:**

|  |  |  |
| --- | --- | --- |
| **Input Size** | **Running Time (μs)** | **Value of A** |
| 10001 | 2490 | 0.0187 |
| 100001 | 32135 | 0.0193 |
| 200001 | 69130 | 0.0196 |
| 300001 | 108812 | 0.0199 |
| 400001 | 146916 | 0.0197 |
| 499001 | 191928 | 0.0203 |
|  | **Average Value of A** | **0.0196** |

1. **Quick Sort:**

|  |  |  |
| --- | --- | --- |
| **Input Size** | **Running Time (μs)** | **Value of A** |
| 10001 | 1185 | 0.00892 |
| 40001 | 5445 | 0.00890 |
| 80001 | 11520 | 0.00884 |
| 100001 | 15554 | 0.00936 |
| 130001 | 20080 | 0.00909 |
| 170001 | 25890 | 0.00876 |
|  | **Average Value of A** | **0.00898** |

1. **Count Sort:**

|  |  |  |
| --- | --- | --- |
| **Input Size** | **Running Time (μs)** | **Value of A** |
| 10001 | 140 | 0.0140 |
| 100001 | 1588 | 0.0159 |
| 200001 | 3554 | 0.0178 |
| 300001 | 6572 | 0.0219 |
| 400001 | 7803 | 0.0195 |
| 499001 | 9945 | 0.0199 |
|  | **Average Value of A** | **0.0182** |