

DATA-Lab6

Question 6.

Both mergeSort() and heapSort() run $O(n\log(n))$. To compare running time of those functions, 2 tests were performed:

⇒ As you can see from the result below, the p-value are all greater than 0.05, which means that H_0 of each test is not rejected. Then, there is no significant difference in running time of mergeSort() and heapSort(). This agrees with the analysis of complexity time.

```
Student's two-sided t_test
Attempt no.1
  n=15, Student's t-test p_value: 0.4240
  n=50, Student's t-test p_value: 0.7174
  n=100, Student's t-test p_value: 0.6190
  n=1000, Student's t-test p_value: 0.4051
Attempt no.2
  n=15, Student's t-test p_value: 0.4473
  n=50, Student's t-test p_value: 0.0935
  n=100, Student's t-test p_value: 0.2132
  n=1000, Student's t-test p_value: 0.8032
Attempt no.3
  n=15, Student's t-test p_value: 0.3851
  n=50, Student's t-test p_value: 0.2010
  n=100, Student's t-test p_value: 0.9403
  n=1000, Student's t-test p_value: 0.5276
Attempt no.4
  n=15, Student's t-test p_value: 0.4366
  n=50, Student's t-test p_value: 0.4332
  n=100, Student's t-test p_value: 0.7260
  n=1000, Student's t-test p_value: 0.1760
Attempt no.5
  n=15, Student's t-test p_value: 0.1708
  n=50, Student's t-test p_value: 0.3631
  n=100, Student's t-test p_value: 0.2730
  n=1000, Student's t-test p_value: 0.2813
```

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Wilcoxon two-sided
Attempt no.1
  Wilcoxon p-value: 0.9939
Attempt no.2
  Wilcoxon p-value: 0.8595
Attempt no.3
  Wilcoxon p-value: 0.9750
Attempt no.4
  Wilcoxon p-value: 0.4422
```

Attempt no.5

Wilcoxon p-value: 0.3158