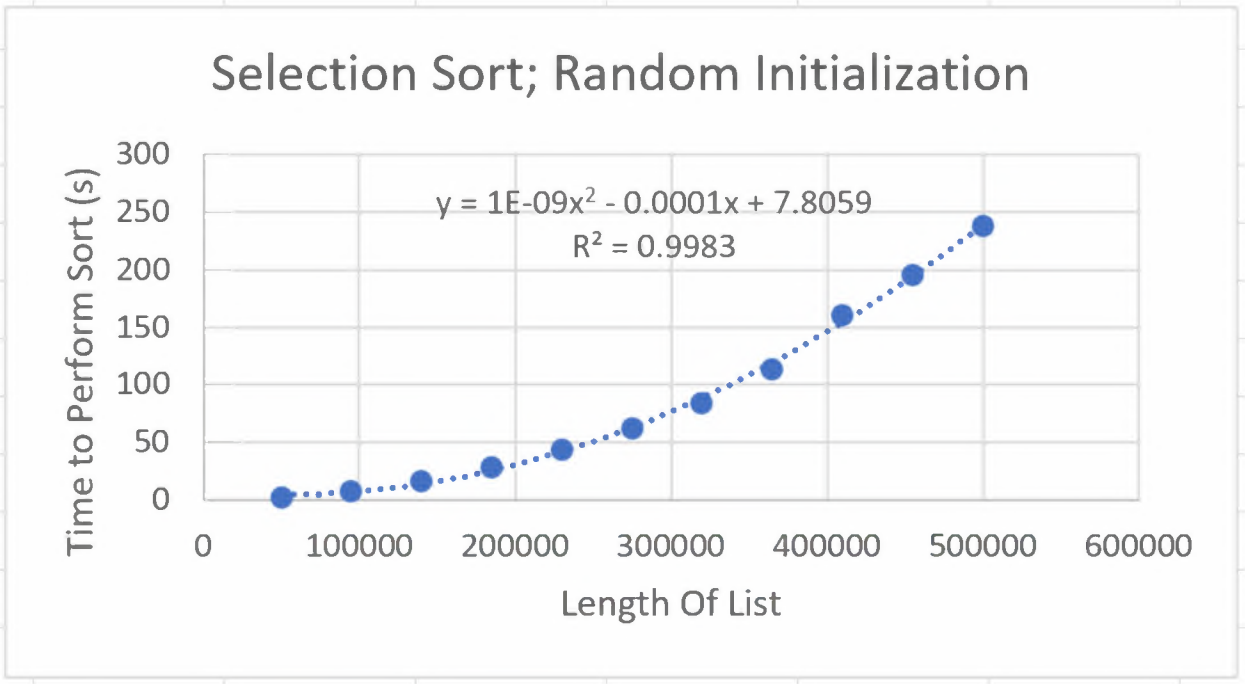
Corey Anderson
2304284
Lab 09

Selection Sort – Random Initialization

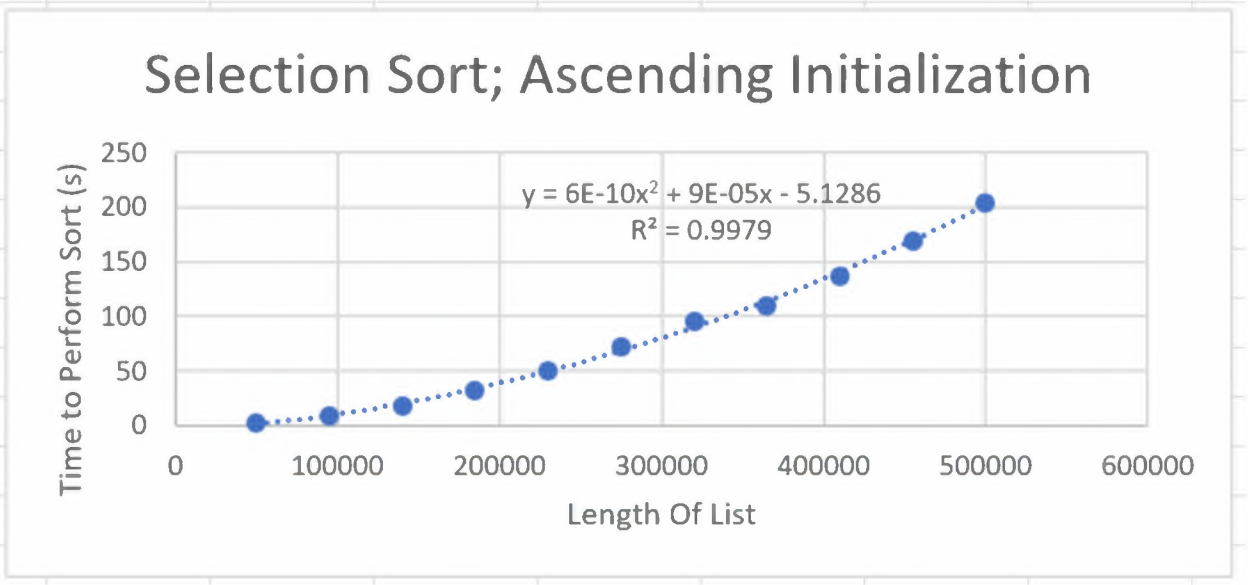
- The 11 data points indicate an $O(n^2)$ relationship between list length and sorting time. The quadratic trendline fits the data with an R^2 value of .9983.
- Prediction for the time required for Selection Sort to sort a randomly initialized list of length 10,000,000: y(10000000)=101007.8059 seconds or 28.05



Corey Anderson
2304284
Lab 09

Selection Sort – Ascending Initialization

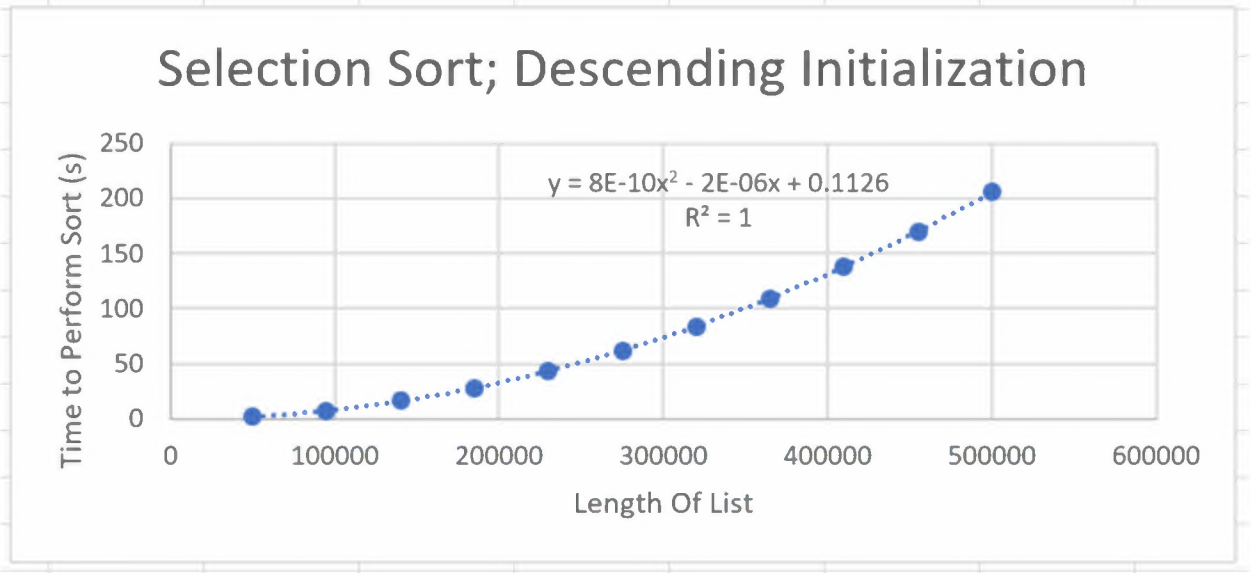
- The 11 data points indicate an $O(n^2)$ relationship between list length and sorting time. The quadratic trendline fits the data with an R^2 value of .9979.
- Prediction for the time required for Selection Sort to sort an ascending (pre-sorted) list of length 10,000,000: y(10000000)=59994.8715 seconds or 16.67 hours



Corey Anderson
2304284
Lab 09

Selection Sort – Descending Initialization

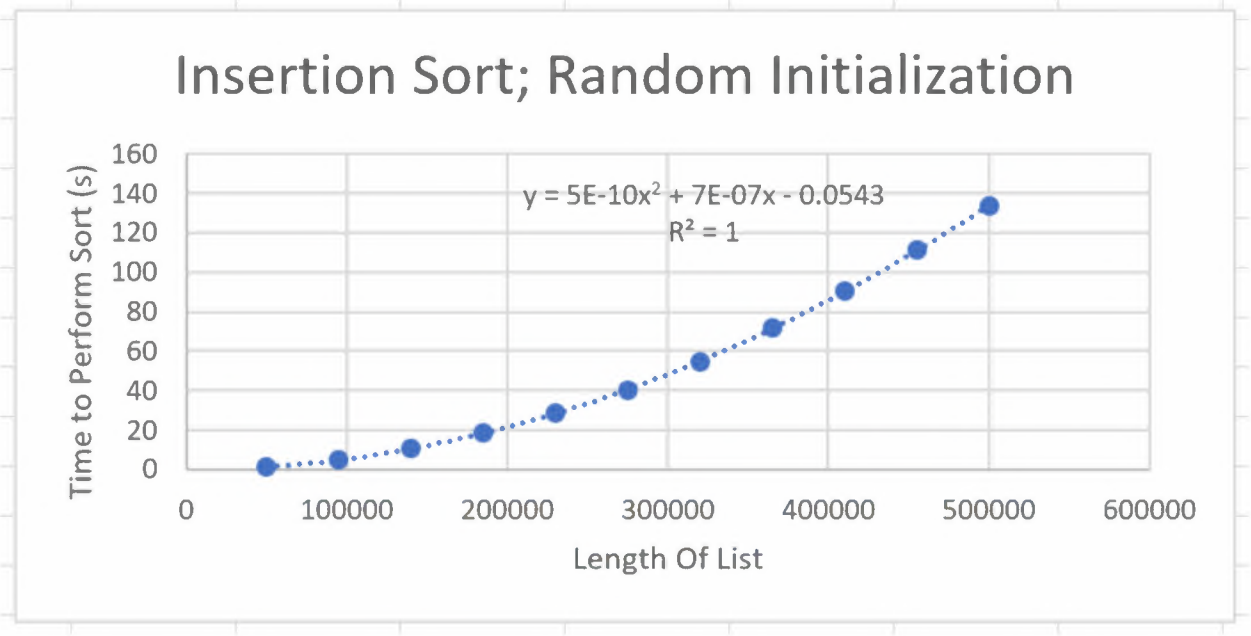
- The 11 data points indicate $O(n^2)$ relationship between list length and sorting time. The quadratic trendline fits the data with an R^2 value of .9999.
- Prediction for the time required for Selection Sort to sort a descending (reverse sorted) list of length 10,000,000: y(10000000)=79940.1126 seconds or 22.21 hours



Corey Anderson
2304284
Lab 09

Insertion Sort – Random Initialization

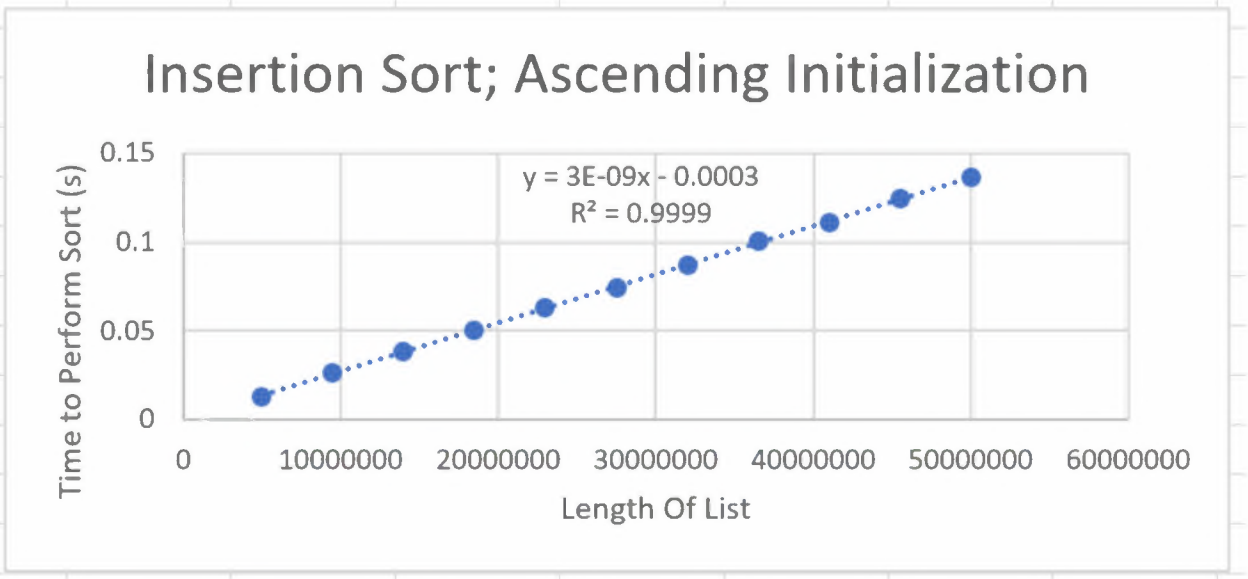
- The 11 data points indicate an $O(n^2)$ relationship between list length and sorting time. The quadratic trendline fits the data with an R^2 value of .9999.
- Prediction for the time required for Insertion Sort to sort a randomly initialized list of length 10,000,000: y(10000000)=50006.9457 seconds or 13.89 hours



Corey Anderson
2304284
Lab 09

Insertion Sort – Ascending Initialization

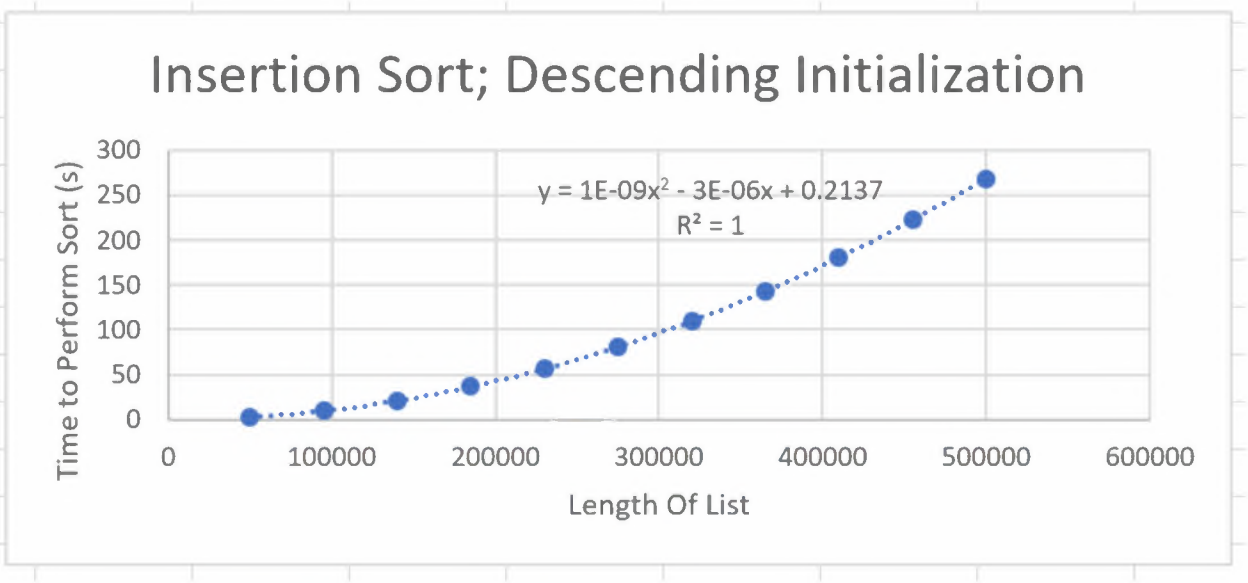
- The 11 data points indicate an linear relationship O(n) between list length and sorting time. The linear trendline fits the data with an R^2 value of .9999.
- Prediction for the time required for Insertion Sort to sort an ascending (pre-sorted) list of length 10,000,000,000: y(10000000000)=29.9997 seconds



Corey Anderson
2304284
Lab 09

Insertion Sort – Descending Initialization

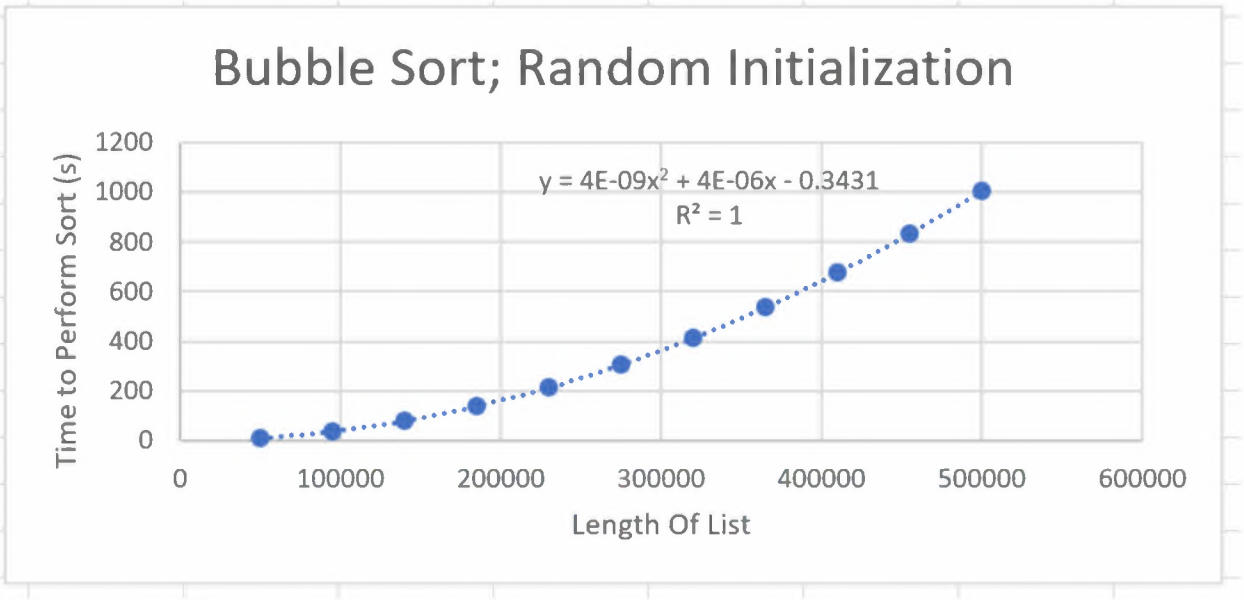
- The 11 data points indicate an $O(n^2)$ relationship between list length and sorting time. The quadratic trendline fits the data with an R^2 value of .9999.
- Prediction for the time required for Insertion Sort to sort a descending (reverse sorted) list of length 10,000,000: y(10000000)=99970.2137 seconds or 27.77 hours



Corey Anderson
2304284
Lab 09

Bubble Sort – Random Initialization

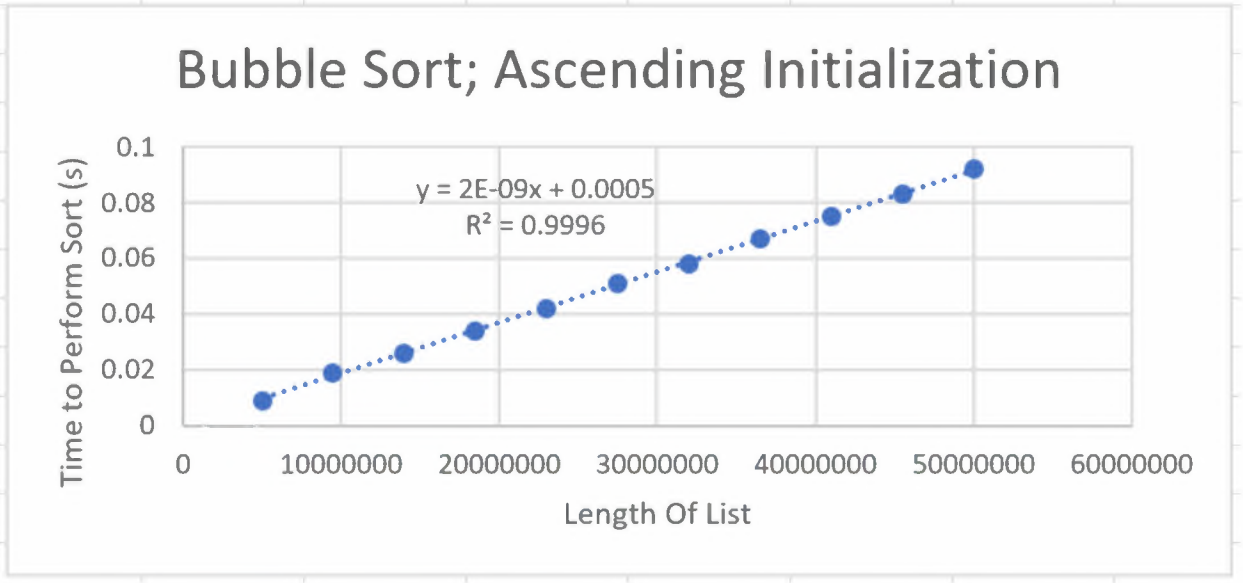
- The 11 data points indicate an $O(n^2)$ relationship between list length and sorting time. The quadratic trendline fits the data with an R^2 value of .9999.
- Prediction for the time required for Insertion Sort to sort a randomly initialized list of length 10,000,000: y(10000000)=99970.2137 seconds or 27.77 hours



Corey Anderson
2304284
Lab 09

Bubble Sort – Ascending Initialization

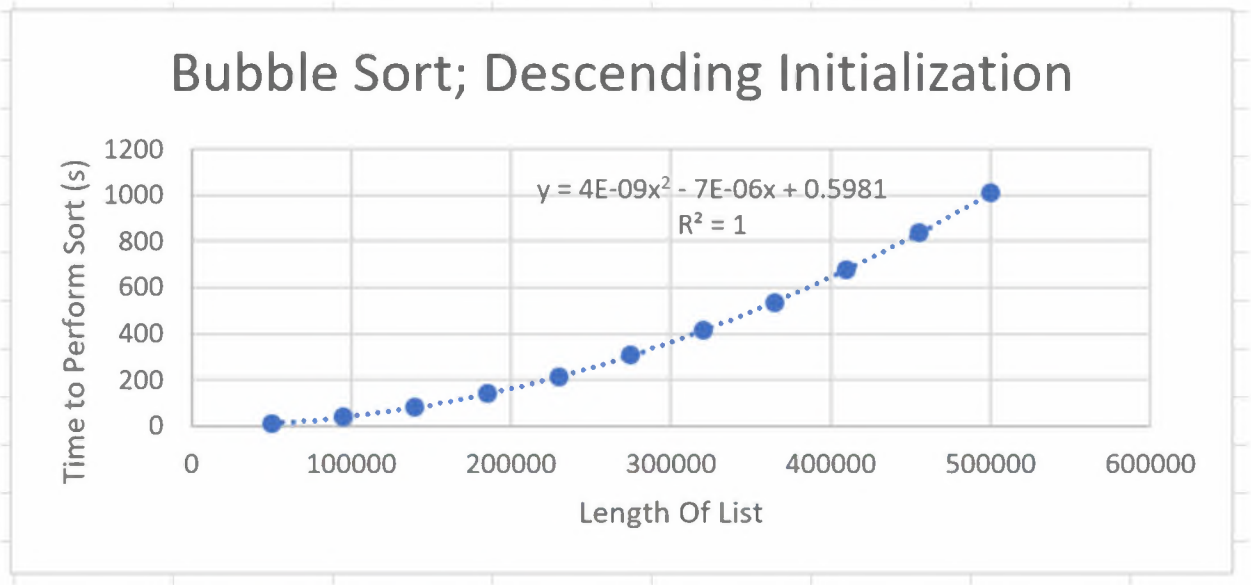
- The 11 data points indicate an O(n) relationship between list length and sorting time. The linear trendline fits the data with an R^2 value of .9996.
- Prediction for the time required for Insertion Sort to sort an ascending (pre-sorted) list of length 10,000,000,000: y(10000000000)=20.0005 seconds



Corey Anderson
2304284
Lab 09

Bubble Sort – Descending Initialization

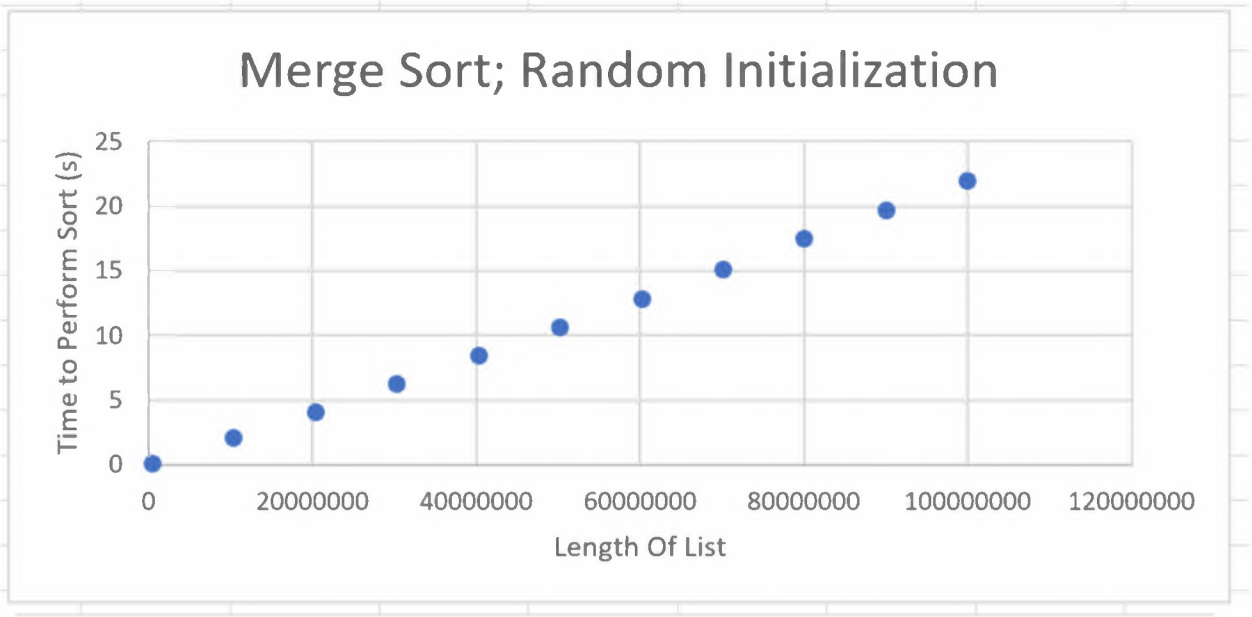
- The 11 data points indicate an $O(n^2)$ relationship between list length and sorting time. The quadratic trendline fits the data with an R^2 value of .9999.
- Prediction for the time required for Bubble Sort to sort a descending (reverse sorted) list of length 10,000,000: y(10000000)=399930.5981 seconds or 111.09 hours



Corey Anderson
2304284
Lab 09

Merge Sort – Random Initialization

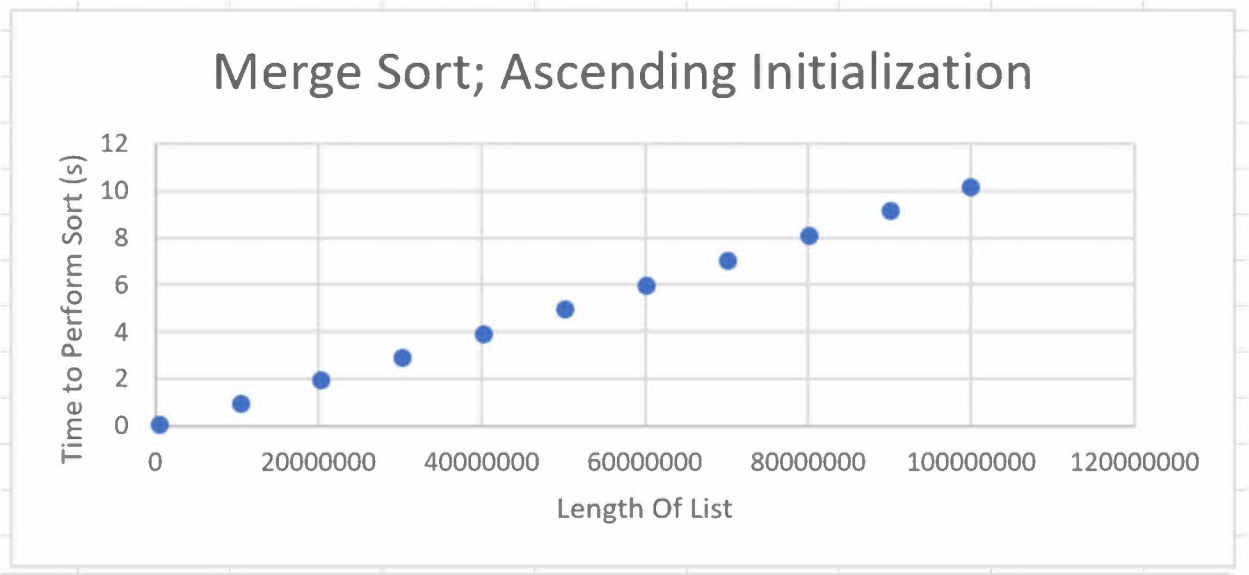
- The 11 data points indicate an $O(n \log_2 n)$ relationship between list length and sorting time. The relation can be modeled by $n*\log_2(n)/120667964.798$.
- Prediction for the time required for Merge Sort to sort a randomly initialized list of length 10,000,000,000,000: y(100000000000)=2752.95 seconds or 45.88 minutes



Corey Anderson
2304284
Lab 09

Merge Sort – Ascending Initialization

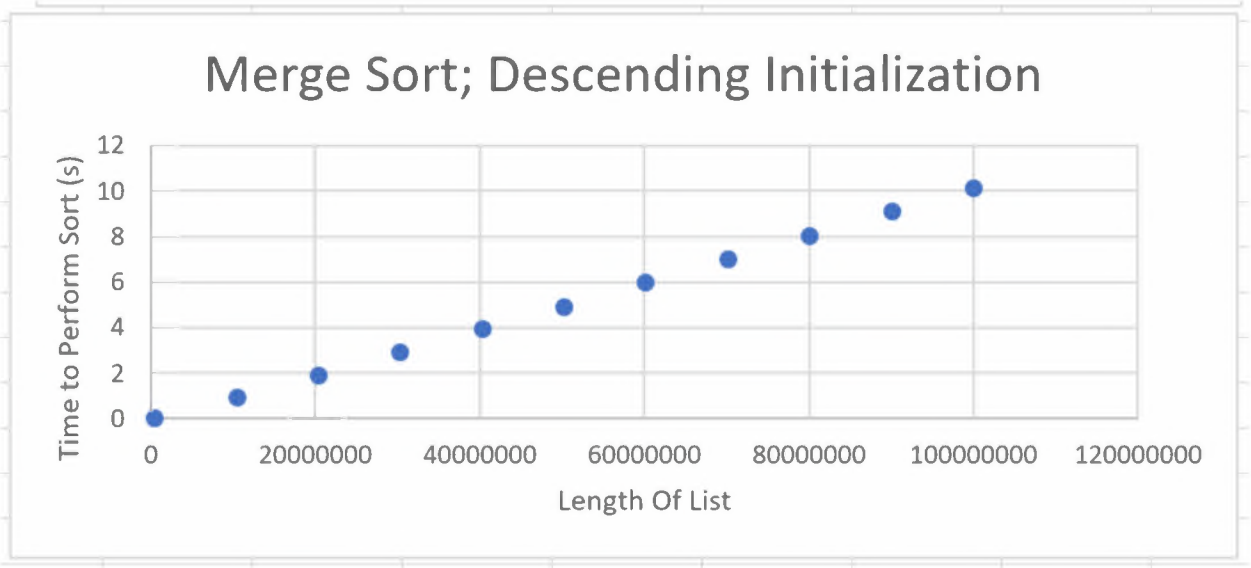
- The 11 data points indicate an $O(n \log_2 n)$ relationship between list length and sorting time. The relation between length of list and time can be modeled by $n*\log_2(n)/259558503.407$.
- Prediction for the time required for Merge Sort to sort an ascending (pre-sorted) list of length 10,000,000,000: y(10000000000)=1279.84 seconds or 21.33 minutes



Corey Anderson
2304284
Lab 09

Merge Sort – Descending Initialization

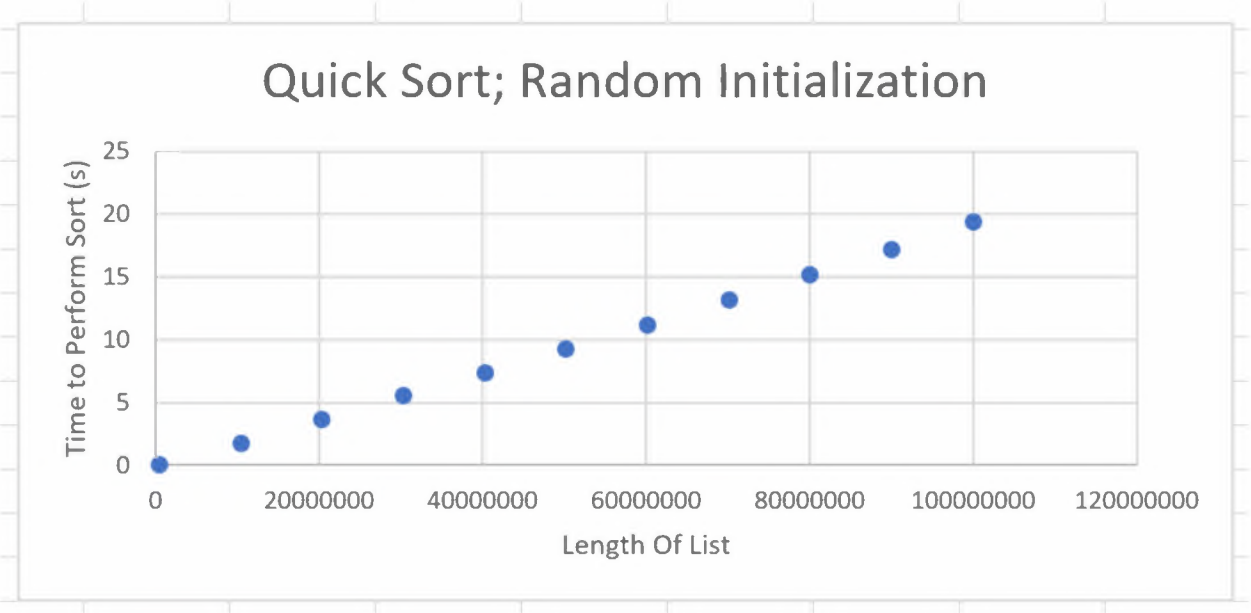
- The 11 data points indicate an $O(n \log_2 n)$ relationship between list length and sorting time. The relation between length of list and time can be modeled by $n*\log_2(n)/472462081.921$.
- Prediction for the time required for Merge Sort to sort a descending (reverse sorted) list of length 10,000,000,000: y(10000000000)=703.110 seconds or 11.72 minutes



Corey Anderson
2304284
Lab 09

Quick Sort – Random Initialization

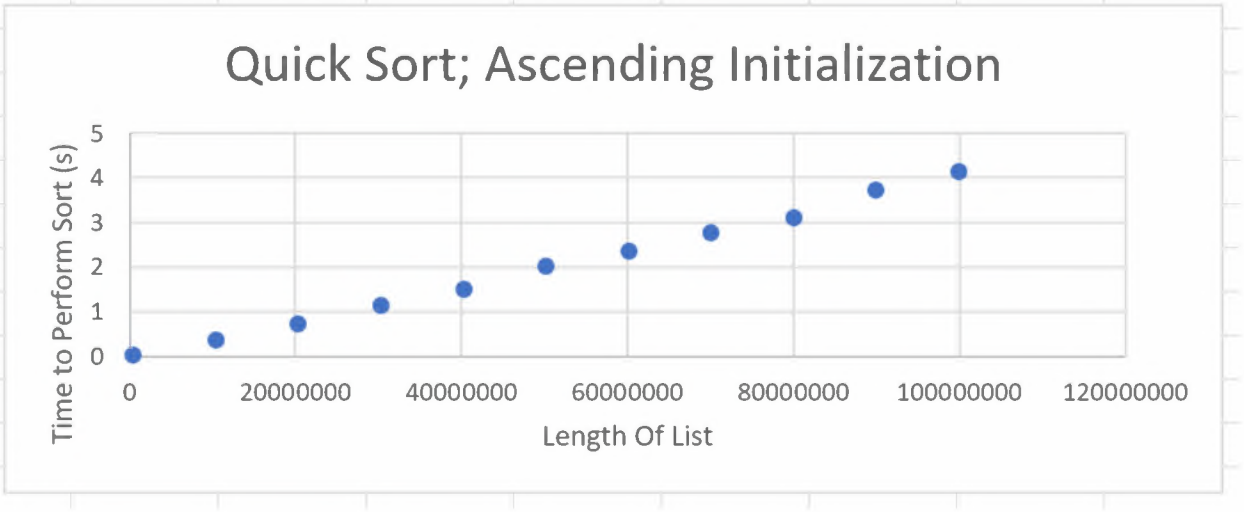
- The 11 data points indicate an $O(n \log_2 n)$ relationship between list length and sorting time. The relation between length of list and time can be modeled by $n*\log_2(n)/138064820.914$
- Prediction for the time required for Quick Sort to sort a randomly initialized list of length 10,000,000,000: y(10000000000)=2406.06 seconds or 40.101 minutes



Corey Anderson
2304284
Lab 09

Quick Sort – Ascending Initialization

- The 11 data points indicate an O(n $\log_2$ n) relationship between list length and sorting time. The relation between length of list and time can be modeled by n*$\log_2$(n)/660939165.693
- Prediction for the time required for Quick Sort to sort an ascending (pre-sorted) list of length 10,000,000,000: y(10000000000)=502.61 seconds or 8.38 minutes



Corey Anderson
2304284
Lab 09

Quick Sort – Descending Initialization

- The 11 data points indicate an $O(n^2)$ relationship between list length and sorting time. The relation between length of list and time can be modeled by $n*\log_2(n)/340194666.03$
- Prediction for the time required for Quick Sort to sort descending (reverse sorted) list of length 10,000,000,000: y(10000000000)=976.48 seconds or 16.27 minutes