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| Introduction The Efficiency Tester app lets you sort a list of numbers using two different algorithms and figure out experimentally which algorithm is bucket sort and which is bubble sort. |  |

# Installing the Efficiency Tester App

Use the barcode scanner app on your device to scan the qr code below. Once the Efficiency Tester app has finished downloading, follow the steps to install the app on your device.

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# The Sorting Experiment

Your task is to experimentally determine which algorithm, Sort1 or Sort2, is the ***fast algorithm (bucket sort)*** and which is the ***slow algorithm (bubble sort)***.

## Run the trials and compute the average time for each sort

Run at least 3 trials for each Sort using lists of size 10, 20, 30, 40, and 50.. Then compute the average number of milliseconds required for each sized list:

1. Input a number (e.g. 10) into the TextBox. This specifies the size of list to be sorted.
2. Click 'Make Random List' and then click the Sort1 button.
3. Record the time in ms in the table below.
4. Click 'Make Random List' and then click the Sort2 button.
5. Record the time in ms in the table below
6. Repeat steps 1-5 two more times. Remember to record your data in the table below.
7. After completing steps 1-6, compute the average number of ms.

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| ***List Size (N)*** | ***Sort 1 (ms)*** | ***Sort 2 (ms)*** |
| ***10*** | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |
| ***20*** | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |
| ***30*** | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |
| ***40*** | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |
| ***50*** | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | | *Trial Trial Trial Avg*  *1 2 3*   |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |

## Graph the table

Draw a graph below that shows the average time for each sort, for each sized list. The graph should reveal which sort is bubble sort and which sort is bucket sort (i.e. which graph shows a fast vs slow rate.)