LAB 1 SORTING

TASK 1: Describe textually your application scenario (in note form)

- Title: Stock Index
- Players: Stock
- Objects Involved: current price, all-time-high, name, volume.
- Motivation: Many times, when doing an investment there is a lot of information that needs to be processed in a rapid manner, often this data come from huge indexes. Depending on the need data need to be sorted.
- Typical issues/problems/questions: current practices in the financial industry such as high-frequency-trading require latency times between request to be as short as possible therebefore efficiency is key when in comes to sorting algorithms.
- Which data is relevant in your application? The highest value stock at the current time

Task 2:

Generated Stock Index Output:

```
Name  |  Price  |  ATH  | Volume |

AAAA  | $99.546 | 55.28 |  33384 |

AAAB  | $2.954  | 85.60 |  35489 |

AAAC  | $9.933  | 64.75 |  64475 |

AAAD  | $61.653 | 70.78 |  90170 |

AAAE  | $26.307 | 56.18 |  43818 |

AAAF  | $72.394 | 56.01 |  80167 |

AAAG  | $88.562 | 69.78 |  37865 |

AAAH  | $60.985 | 53.80 |  28138 |

AAAI  | $78.068 | 34.79 |  86933 |

AAAJ  | $16.595 | 23.60 |  53164 |
```

Task 3:

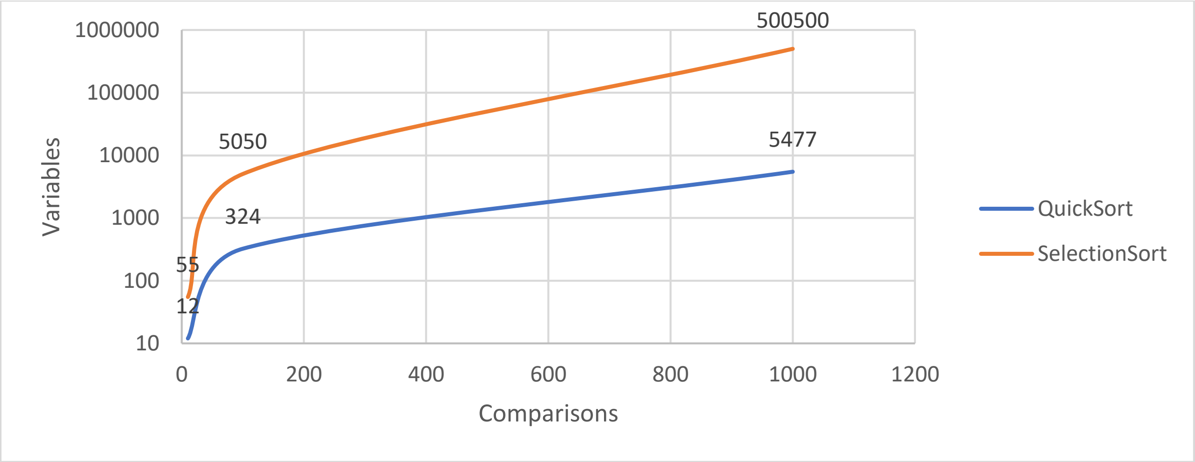
QUICKSORT 1000 Stocks Test 1000 Runs:

Type of Algorithm	**1000 runs AVG**	
	Comparisons	Swaps
QuickSort{Pivot Start}	5509	6176
QuickSort{Pivot End}	5453	6119
QuickSort{Pivot Middle}	5477	6144

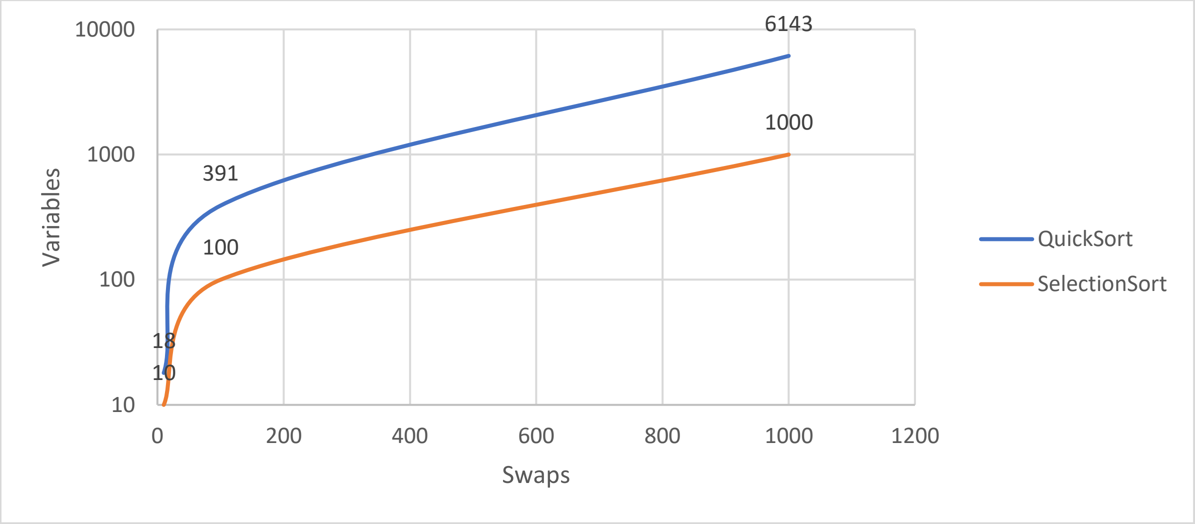
Task 4:

Type of Algorithm		Single Run		1000 runs AVG	
	Load	Comparisons	Swaps	Comparisons	Swaps
QuickSort	10	17	23	12	18
	100	386	454	324	391
	1000	5102	5766	5477	6143
Selection Sort	10	55	10	55	10
	100	5050	100	5050	100
	1000	500500	1000	500500	1000

Number Of Variables vs Comparisons



Number Of Variables vs Swaps


Variables
Swaps
QuickSort
SelectionSort