# 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**