Samuel Geremew

G00871227

CS483

Dana Richards

Grey Code Sorting and Data Compression Report

The average number of loop iterations for Grey was 446,675, for Horner was 210,000, and for Radix was 200,260. Radix sort algorithm was the most efficient in that sense by a factor of 2 when compared to the Grey Code comparison algorithm. Radix sort is also the only one that does not do comparisons in order to sort.

|  |  |  |  |
| --- | --- | --- | --- |
| Loop Iterations | Grey | Horner | Radix |
|  | 387277 | 210000 | 200292 |
|  | 508189 | 210000 | 200252 |
|  | 471800 | 210000 | 200254 |
|  | 439340 | 210000 | 200264 |
|  | 482444 | 210000 | 200288 |
|  | 387736 | 210000 | 200256 |
|  | 367112 | 210000 | 200258 |
|  | 393918 | 210000 | 200242 |
|  | 512612 | 210000 | 200224 |
|  | 516323 | 210000 | 200274 |
| Averages | 446675.1 | 210000 | 200260.4 |

If we take a look at the Full and Binary Scores before and after we can get a sense of data compression and how effective the algorithms are. The scores for all three algorithms are the same because they are all just different ways of solving the same problem. On average the Full Score was reduced by 29% and the Binary Score was reduced by 27%.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Full Score | Binary Score | Original Full Score | Original Binary Score |
|  | 284407 | 121660 | 372800 | 159812 |
|  | 203169 | 98684 | 299366 | 136389 |
|  | 213267 | 97840 | 301964 | 136529 |
|  | 222421 | 111357 | 323005 | 148200 |
|  | 270918 | 113516 | 364664 | 152891 |
|  | 212555 | 101505 | 304776 | 137481 |
|  | 218208 | 109312 | 313065 | 145325 |
|  | 179629 | 82390 | 277048 | 118424 |
|  | 161331 | 80135 | 244921 | 119819 |
|  | 262146 | 109751 | 340566 | 151699 |
| Averages | 222805.1 | 102615 | 314217.5 | 140656.9 |