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A3

Compile the programs with make.

run anagrams program with command ./A3q1

The program will prompt you for a string. Since the given file is all integers, try testing with some large integers like 1234567890.

The number of anagrams found by each program and the time it took to do it will be displayed.

Run string search program with command ./A3q2

The program will prompt you for a string.

The number of occurrences found by each program and the time it took to do it will be displayed.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| String | BF shifts | H shifts | Shift ratio  H/BF | BF runtime | H runtime | Runtime ratio H/BF |
| "a" | 3296591 | 3296591 | 1 | 0.018 | 0.019 | 1.055555556 |
| “to” | 3296590 | 1707738 | 0.518031663 | 0.02 | 0.018 | 0.9 |
| “and” | 3296589 | 1163338 | 0.3528914281 | 0.05 | 0.013 | 0.26 |
| “from” | 3296588 | 887990 | 0.2693663873 | 0.017 | 0.009 | 0.5294117647 |
| “other” | 3296587 | 751147 | 0.2278559613 | 0.045 | 0.011 | 0.2444444444 |
| “school” | 3296586 | 594188 | 0.1802434397 | 0.019 | 0.006 | 0.3157894737 |
| “student” | 3296585 | 566976 | 0.1719888915 | 0.021 | 0.006 | 0.2857142857 |
| “academic” | 3296584 | 496337 | 0.150561005 | 0.019 | 0.005 | 0.2631578947 |
| “bbbbbbbbb” | 3296583 | 369393 | 0.1120532988 | 0.018 | 0.004 | 0.2222222222 |
| “misconduct” | 3296582 | 390413 | 0.1184296341 | 0.018 | 0.004 | 0.2222222222 |
|  |  |  |  |  |  |  |
| Avg shift ratio | 0.3101421709 |  |  |  |  |  |
| Avg time ratio | 0.4298517863 |  |  |  |  |  |

Conclusion: The horspool algorithm has a great decrease in both shifts and runtime, as indicated by both ratios in all cases except the first since it cannot shift by more than one. As the string to be matched increases in size, the advantage of the horspool algorithm grows since it is able to shift by larger and larger amounts.