**Performance Analysis**

Performance vs. Sequence Length

1/30: Initial Algorithms

Needleman-Wunsch

|  | 5 | 10 | 20 | 30 | 40 | 50 |
| --- | --- | --- | --- | --- | --- | --- |
| 5 | 0s | 0s | 0s | 0s | 0s | 1.77s  1.76s  1.79s |
| 10 | 0s | 0s | 0s | 0s | 0s | 31.51s  31.63s  31.47s |
| 20 | 0s | 0s | 0s | 0.2s  0.2s  0.2s | 421.83s  432.09s  424.8s | 0.23s  0.23s  0.23s |
| 30 | 0s | 0.1s  0.1s  0.1s | 0s | 0.5s  0.5s  0.5s | 0.4s  0.4s  0.4s | 0.03s  0.03s  0.03s |
| 40 | 1.28s  1.26s  1.26s | 2.10s  2.08s  2.08s | 0s | 0.2s  0.2s  0.2s | 0.8s  0.8s  0.8s | 0.1s  0.1s  0.1s |
| 50 | 2.19s  2.15s  2.16s | 404.81s  407.45s  411.25s | 34.6s  34.21s  34.34s | 0.1s  0.1s  0.1s | 0.09s  0.09s  0.09s | 0.1s  0.1s  0.1s |

Smith-Waterman

|  | 5 | 10 | 20 | 30 | 40 | 50 |
| --- | --- | --- | --- | --- | --- | --- |
| 5 | 0s | 0s | 0s | 0s | 0s | 0s |
| 10 | 0s | Err | 0s | Err | 0s | 0s |
| 20 | 0s | Err | 0s | Err | 0s | Err |
| 30 | 0s | 0s | Err | 0s | 0s | Err |
| 40 | 1.29s  1.27s  1.27s | 2.08s  2.08s  2.09s | 0s | 0.02s  0.02s  0.02s | 0.77s  0.77s  0.79s | 0.01s  0.01s  0.01s |
| 50 | 0.15s  0.15s  0.15s | 402.76s  397.91s | 0s | 0s | Err | 0.01s  0.01s  0.01s |