块大小实验

Homo\_sapiens.GRCh38.dna.primary\_assembly.fa.gz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| m | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm4 | ***1833.65*** | 1416.69 | 1265.22 | 1089.91 | 954.36 | 937.78 | 918.14 | 848.27 | 728.48 | 719.65 | 591.28 | 621.64 | 497.39 | 536.42 | 406.07 |
| iepsm5 | 1976.54 | 1350.44 | 1045.03 | 865.67 | 763.62 | 685.66 | 663.47 | 612.89 | 567.02 | 480.07 | 386.43 | 374.30 | 346.34 | 364.98 | 273.49 |
| iepsm6 | 2134.28 | ***1345.82*** | ***992.15*** | ***807.76*** | ***683.10*** | ***582.12*** | ***517.52*** | 500.12 | 459.53 | 386.18 | 322.16 | 282.56 | 213.18 | 191.98 | 176.22 |
| iepsm7 | 2516.66 | 1455.80 | 1025.39 | 817.82 | 697.70 | 595.98 | 544.09 | 485.27 | 449.21 | 360.28 | 308.06 | 252.78 | 193.30 | 144.38 | 122.68 |
| iepsm8 | 3077.91 | 1549.02 | 1078.94 | 824.01 | 699.93 | 594.25 | 532.21 | ***466.46*** | ***445.42*** | ***351.45*** | ***303.27*** | ***236.61*** | ***151.72*** | ***116.49*** | ***92.90*** |

Homo\_sapiens.GRCh38.pep.all.fa.gz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| m | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm4 | ***21.97*** | ***15.36*** | ***11.56*** | ***9.23*** | ***9.90*** | ***6.99*** | ***6.34*** | ***5.80*** | ***5.29*** | ***4.51*** | 4.44 | ***2.83*** | 2.22 | 1.39 | 1.36 |
| iepsm5 | 26.37 | 17.30 | 13.17 | 10.78 | 10.73 | 7.65 | 6.84 | 6.10 | 5.48 | 4.75 | 4.47 | 3.08 | 2.30 | 1.60 | 1.35 |
| iepsm6 | 30.75 | 18.80 | 13.85 | 11.14 | 10.88 | 7.95 | 7.12 | 6.50 | 5.57 | 4.58 | ***4.13*** | 3.06 | 2.40 | 1.49 | 1.38 |
| iepsm7 | 36.49 | 20.66 | 14.94 | 11.65 | 11.34 | 8.27 | 7.27 | 6.52 | 5.59 | 4.93 | 4.40 | 3.23 | 2.36 | 1.52 | 1.44 |
| iepsm8 | 44.74 | 22.52 | 15.73 | 11.99 | 11.50 | 8.25 | 7.33 | 6.49 | 5.49 | 4.68 | 4.21 | 2.87 | ***2.11*** | ***1.35*** | ***1.24*** |

Oryza\_sativa.IRGSP-1.0.24.dna.genome.fa.gz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| m | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm4 | ***269.64*** | 192.34 | 154.25 | 134.13 | 130.48 | 116.81 | 108.32 | 103.69 | 100.46 | 86.73 | 74.67 | 72.00 | 71.69 | 68.10 | 60.38 |
| iepsm5 | 271.99 | 190.55 | 145.98 | 120.71 | 108.45 | 96.35 | 88.26 | 79.59 | 77.07 | 60.81 | 53.69 | 48.03 | 48.64 | 46.16 | 37.02 |
| iepsm6 | 296.24 | ***188.66*** | ***137.71*** | ***113.11*** | ***94.04*** | ***81.05*** | 73.69 | 64.99 | 64.88 | 49.67 | 42.68 | 35.22 | 27.21 | 23.70 | 19.37 |
| iepsm7 | 358.05 | 207.44 | 144.98 | 118.34 | 95.81 | 82.95 | 74.96 | 64.81 | 60.37 | 47.32 | 40.90 | 33.56 | 23.38 | 17.28 | 13.45 |
| iepsm8 | 440.13 | 226.16 | 153.86 | 118.23 | 96.98 | 84.19 | ***72.78*** | ***64.14*** | ***59.39*** | ***45.95*** | ***40.89*** | ***30.60*** | ***20.59*** | ***15.19*** | ***10.92*** |

Oryza\_sativa.IRGSP-1.0.24.pep.all.fa.gz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| m | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm4 | ***9.7*** | ***7.25*** | ***5.56*** | ***4.92*** | ***4.3*** | ***3.91*** | ***3.61*** | 3.57 | 2.59 | 3.12 | 2.31 | 1.63 | 1.58 | 1.22 | 1.09 |
| iepsm5 | 11.55 | 7.56 | 6.2 | 5.25 | 4.68 | 4.31 | 4.36 | 3.02 | 3.01 | 2.4 | 2.55 | 1.9 | 1.23 | 0.83 | 0.76 |
| iepsm6 | 11.89 | 8.57 | 6.38 | 5.55 | 4.89 | 4.63 | 3.88 | 3.42 | 3.13 | ***2.27*** | ***2.01*** | ***1.39*** | 1.36 | 1.34 | 1.21 |
| iepsm7 | 14.13 | 8.31 | 6.48 | 5.45 | 4.31 | 4.43 | 4.58 | ***2.74*** | ***2.8*** | 2.31 | 2.05 | 1.73 | 0.74 | 0.85 | 0.64 |
| iepsm8 | 17.74 | 9.31 | 6.58 | 6.08 | 4.42 | 4.04 | 4.22 | 3.67 | 3.34 | 2.84 | 2.39 | 1.72 | ***0.69*** | ***0.69*** | ***0.19*** |

NC\_000913.fna

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| m | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm4 | ***3.27*** | 3.08 | 2.09 | 2.21 | 2.12 | 2.02 | 1.31 | 1.81 | 1.36 | 1.76 | 1.31 | 1.22 | 1.46 | 1.22 | 1.7 |
| iepsm5 | 3.84 | 2.77 | 2.2 | 1.37 | 1.74 | 1.96 | 1.71 | 0.97 | 1.37 | 1.05 | 1.25 | 1.13 | 1.11 | 0.71 | 0.71 |
| iepsm6 | 3.54 | ***2.31*** | ***2.09*** | ***1.14*** | ***1.18*** | ***1.03*** | ***0.83*** | 1.13 | 1.31 | 0.5 | 0.65 | 0.34 | 0.6 | 1.05 | 0.3 |
| iepsm7 | 3.95 | 2.42 | 2.31 | 1.27 | 1.84 | 1.61 | 1.57 | 1.34 | 1.28 | 1.25 | 1.21 | 0.9 | 0.84 | 0.62 | 0.51 |
| iepsm8 | 4.85 | 3.6 | 2.46 | 1.44 | 1.36 | 1.51 | 1.51 | ***0.69*** | ***0.57*** | ***0.52*** | ***0.81*** | ***0.79*** | ***0.17*** | ***0.4*** | ***0.43*** |

NC\_000913.faa

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| m | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm4 | ***1.58*** | ***1.2*** | ***0.79*** | ***0.63*** | ***0.36*** | ***0.46*** | 0.49 | ***0.33*** | ***0.22*** | 0.44 | 0.66 | 0.69 | 0.99 | 0.87 | 1.11 |
| iepsm5 | 1.61 | 1.54 | 1.08 | 0.98 | 0.86 | 1.02 | 1.19 | 0.44 | 0.78 | 0.52 | 0.96 | 0.84 | 0.82 | 0.54 | 0.48 |
| iepsm6 | 1.72 | 1.68 | 0.85 | 1.03 | 0.89 | 1.16 | ***0.31*** | 0.67 | 0.84 | ***0.35*** | ***0.42*** | ***0.16*** | 0.48 | 0.93 | 0.18 |
| iepsm7 | 1.89 | 1.66 | 1.01 | 0.85 | 0.79 | 0.65 | 1.23 | 0.39 | 0.36 | 0.43 | 0.46 | 0.73 | 0.31 | 0.34 | 0.39 |
| iepsm8 | 1.97 | 1.66 | 1.05 | 0.94 | 0.42 | 0.46 | 0.87 | 1.08 | 0.93 | 0.9 | 0.98 | 0.38 | ***0.28*** | ***0.19*** | ***0.15*** |

不同算法在各种类型数据下的对比实验

NC\_000913.fna

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm | 1.12 | 1.95 | 2.11 | 1.58 | 1.17 | 0.95 | 0.79 | 0.72 | 0.63 | 0.53 | 0.52 | 0.41 | 0.34 | 0.26 | 0.17 | 0.13 | 0.11 |
| ssecp | 2.09 | 2.03 | 2.70 | 2.59 | 2.58 | 2.21 | 2.21 | 1.86 | 1.86 | 1.67 | 1.67 | 1.25 | 1.09 | 0.81 | 0.76 | 0.31 | 0.27 |
| hashq |  | 9.87 | 5.75 | 4.32 | 3.43 | 2.90 | 2.82 | 2.44 | 2.28 | 2.06 | 1.97 | 1.50 | 1.12 | 1.24 | 0.90 | 1.09 | 0.84 |
| tvsbs | 8.52 | 7.43 | 8.72 | 5.28 | 5.19 | 4.63 | 5.49 | 5.67 | 6.48 | 4.91 | 6.01 | 3.98 | 5.92 | 5.43 | 3.46 | 3.56 |  |
| ufndmq | 3.45 | 3.13 | 2.40 | 1.96 | 1.65 | 1.42 | 1.25 |  |  |  |  | 1.23 | 1.28 | 1.25 | 1.33 | 1.29 |  |
| fsbndmq | 3.78 | 2.87 | 4.44 | 3.89 | 3.06 | 2.73 | 2.31 | 2.12 | 2.32 | 2.28 | 2.31 | 2.22 | 2.34 | 2.21 | 2.40 | 2.27 | 2.26 |

NC\_000913.faa

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm | 0.32 | 0.55 | 0.64 | 0.44 | 0.34 | 0.27 | 0.22 | 0.20 | 0.19 | 0.17 | 0.16 | 0.13 | 0.12 | 0.09 | 0.06 | 0.04 | 0.03 |
| ssecp | 0.59 | 0.57 | 0.76 | 0.73 | 0.72 | 0.63 | 0.62 | 0.52 | 0.52 | 0.47 | 0.47 | 0.35 | 0.31 | 0.23 | 0.21 | 0.09 | 0.08 |
| hashq |  | 2.80 | 1.92 | 1.37 | 1.09 | 0.90 | 0.78 | 0.70 | 0.61 | 0.57 | 0.53 | 0.39 | 0.29 | 0.22 | 0.22 | 0.22 | 0.20 |
| tvsbs | 2.41 | 2.11 | 1.00 | 0.92 | 0.65 | 0.66 | 0.48 | 0.45 | 0.49 | 0.37 | 0.35 | 0.27 | 0.17 | 0.17 | 0.19 | 0.16 |  |
| ufndmq | 0.97 | 0.88 | 0.72 | 0.54 | 0.44 | 0.37 | 0.33 |  |  |  |  | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 |  |
| fsbndmq | 1.07 | 0.81 | 0.82 | 0.80 | 0.81 | 0.42 | 0.42 | 0.31 | 0.33 | 0.30 | 0.33 | 0.31 | 0.32 | 0.30 | 0.27 | 0.30 | 0.30 |

Oryza\_sativa.IRGSP-1.0.24.dna.genome.fa.gz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm | 169.92 | 165.04 | 228.40 | 151.26 | 114.72 | 91.36 | 78.11 | 68.68 | 61.67 | 54.29 | 52.82 | 41.62 | 35.23 | 26.67 | 18.35 | 13.29 | 12.02 |
| ssecp | 213.13 | 385.75 | 239.51 | 209.75 | 179.67 | 151.22 | 148.94 | 135.77 | 123.39 | 101.63 | 88.62 | 80.36 | 65.85 | 61.79 | 55.02 | 26.20 | 21.95 |
| hashq |  | 1987.80 | 566.15 | 418.70 | 339.13 | 286.26 | 249.91 | 218.80 | 210.56 | 194.73 | 339.62 | 155.96 | 199.81 | 133.05 | 77.25 | 101.84 | 78.27 |
| tvsbs | 1698.78 | 1483.86 | 714.36 | 511.05 | 498.46 | 407.29 | 480.13 | 481.57 | 404.24 | 417.95 | 381.82 | 351.14 | 408.67 | 400.34 | 214.64 | 327.43 |  |
| ufndmq | 678.29 | 626.31 | 247.87 | 183.08 | 166.76 | 130.78 | 125.88 |  |  |  |  | 124.32 | 129.60 | 123.76 | 117.68 | 129.39 |  |
| fsbndmq | 742.37 | 577.44 | 497.26 | 344.86 | 314.94 | 264.39 | 232.95 | 209.70 | 201.34 | 225.78 | 206.67 | 220.97 | 216.02 | 218.17 | 196.92 | 214.52 | 223.56 |

Oryza\_sativa.IRGSP-1.0.24.pep.all.fa.gz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm | 3.70 | 6.44 | 7.22 | 4.91 | 3.79 | 3.02 | 2.56 | 2.33 | 2.18 | 2.31 | 1.74 | 1.53 | 1.36 | 0.98 | 0.67 | 0.51 | 0.40 |
| ssecp | 8.55 | 15.49 | 9.61 | 8.42 | 7.22 | 6.07 | 5.98 | 5.45 | 4.95 | 4.08 | 3.56 | 3.22 | 2.64 | 2.48 | 2.21 | 1.05 | 0.88 |
| hashq |  | 32.61 | 22.51 | 15.59 | 12.16 | 10.41 | 8.70 | 7.94 | 7.33 | 6.69 | 5.93 | 4.55 | 3.24 | 2.50 | 2.76 | 3.54 | 2.21 |
| tvsbs | 28.15 | 24.54 | 11.22 | 10.10 | 7.87 | 7.06 | 5.61 | 5.43 | 4.71 | 4.40 | 3.54 | 3.01 | 2.13 | 1.92 | 2.13 | 1.72 |  |
| ufndmq | 11.39 | 10.34 | 8.24 | 6.20 | 5.14 | 4.19 | 3.64 |  |  |  |  | 3.57 | 3.63 | 3.64 | 3.58 | 3.62 |  |
| fsbndmq | 12.47 | 9.48 | 9.11 | 9.03 | 9.13 | 4.83 | 4.85 | 3.44 | 3.52 | 4.09 | 3.18 | 3.55 | 3.30 | 3.16 | 3.40 | 3.33 | 3.38 |

Homo\_sapiens.GRCh38.dna.primary\_assembly.fa.gz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm | 414.69 | 721.54 | 1832.40 | 1264.26 | 928.72 | 776.36 | 616.11 | 560.68 | 536.67 | 424.29 | 400.82 | 320.62 | 280.23 | 200.67 | 136.35 | 96.29 | 88.02 |
| ssecp | 1813.73 | 3282.73 | 2038.23 | 1784.97 | 1528.99 | 1286.82 | 1267.48 | 1155.40 | 1050.05 | 864.87 | 754.16 | 683.86 | 560.38 | 525.83 | 468.22 | 222.96 | 186.79 |
| hashq |  | 3550.90 | 4720.15 | 3536.70 | 3528.13 | 2424.26 | 2200.91 | 1936.80 | 1592.56 | 1672.73 | 1488.62 | 1304.96 | 840.81 | 1080.05 | 904.25 | 576.84 | 952.27 |
| tvsbs | 3152.41 | 2749.97 | 6080.36 | 7264.05 | 6016.46 | 4960.29 | 3200.13 | 4640.57 | 3320.24 | 3624.95 | 3440.82 | 3800.14 | 2352.67 | 3216.34 | 3128.64 | 1632.43 |  |
| ufndmq | 1276.52 | 1158.25 | 2008.87 | 1592.08 | 1368.76 | 1272.78 | 968.88 |  |  |  |  | 1040.32 | 1040.60 | 1056.76 | 1000.68 | 1192.39 |  |
| fsbndmq | 1398.64 | 1061.92 | 3736.26 | 2664.86 | 2360.94 | 2320.39 | 1736.95 | 1768.70 | 1928.34 | 1864.78 | 1800.67 | 1896.97 | 1760.02 | 1808.17 | 1704.92 | 1848.52 | 1848.56 |

Homo\_sapiens.GRCh38.pep.all.fa.gz

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 44 | 64 | 128 | 256 | 512 | 1024 | 2048 |
| iepsm | 9.44 | 16.38 | 22.93 | 13.81 | 10.97 | 8.48 | 7.23 | 7.85 | 5.85 | 5.48 | 5.09 | 4.29 | 4.03 | 2.85 | 1.82 | 1.37 | 1.22 |
| ssecp | 12.38 | 23.30 | 33.35 | 20.66 | 18.10 | 15.52 | 13.05 | 12.86 | 11.71 | 10.64 | 8.77 | 7.65 | 6.92 | 5.67 | 4.75 | 3.25 | 2.89 |
| hashq |  | 83.20 | 61.35 | 43.74 | 34.90 | 28.81 | 24.88 | 22.20 | 20.06 | 18.19 | 23.74 | 11.00 | 9.31 | 7.45 | 7.36 | 9.43 | 5.81 |
| tvsbs | 71.82 | 62.49 | 36.04 | 23.78 | 22.83 | 17.70 | 17.90 | 14.40 | 12.69 | 12.33 | 9.87 | 6.68 | 5.63 | 5.70 | 6.07 | 5.16 |  |
| ufndmq | 29.08 | 26.38 | 24.87 | 17.45 | 14.20 | 11.98 | 10.32 |  |  |  |  | 10.26 | 11.96 | 10.42 | 10.19 | 10.15 |  |
| fsbndmq | 31.86 | 24.19 | 26.25 | 25.73 | 25.74 | 13.52 | 13.77 | 11.74 | 8.59 | 9.86 | 8.74 | 8.89 | 13.34 | 9.57 | 9.10 | 9.84 | 9.40 |