Explain why the time for LinkStrand does not change much at all over all the runs in the benchmark program. Explain why you think memory is exhausted at the specific strand size you see in your timings -- as compared to exhaustion for String and StringBuilder.

Because in LinkStrand, creating a new node that takes on the value of an already created node is much faster than making an entirely new String or a StringBuilder. Memory is also not exhausted because instead of generating new content the only thing new that’s generated is a pointer to the same information that’s already been created.

dna length = 13,917,663 cutting at enzyme gaattc

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Class  
----- LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand: LinkStrand:

splicee recomb

256 14,401,413

512 14,896,773 1,024 15,887,493 2,048 17,868,933 4,096 21,831,813 8,192 29,757,573

time

0.013 0.014 0.012 0.012 0.015 0.015 0.015

appends

3870  
3870  
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0.009 3870 0.009 3870 0.012 3870 0.009 3870 0.023 3870 0.051 3870 0.010 3870 0.011 3870 0.011 3870 0.013 3870 0.020 3870

16,384 45,609,093 32,768 77,312,133 0.016 65,536 140,718,2130.019

131,072 267,530,3730.024 262,144 521,154,6930.017 524,288 1,028,403,333

1,048,576 2,042,900,613 2,097,152 4,071,895,173 4,194,304 8,129,884,293 8,388,608 16,245,862,533 16,777,216 32,477,819,013 33,554,432 64,941,731,973

67,108,864 129,869,557,893 134,217,728259,725,209,733 268,435,456519,436,513,413 536,870,9121,038,859,120,773

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dna length = 13,917,663

cutting at enzyme gaattc

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Class splicee recomb time appends

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LinkStrand: 256 14,401,413 0.013 3870

LinkStrand: 512 14,896,773 0.014 3870

LinkStrand: 1,024 15,887,493 0.012 3870

LinkStrand: 2,048 17,868,933 0.012 3870

LinkStrand: 4,096 21,831,813 0.015 3870

LinkStrand: 8,192 29,757,573 0.015 3870

LinkStrand: 16,384 45,609,093 0.015 3870

LinkStrand: 32,768 77,312,133 0.016 3870

LinkStrand: 65,536 140,718,213 0.019 3870

LinkStrand: 131,072 267,530,373 0.024 3870

LinkStrand: 262,144 521,154,693 0.017 3870

LinkStrand: 524,288 1,028,403,333 0.009 3870

LinkStrand: 1,048,576 2,042,900,613 0.009 3870

LinkStrand: 2,097,152 4,071,895,173 0.012 3870

LinkStrand: 4,194,304 8,129,884,293 0.009 3870

LinkStrand: 8,388,608 16,245,862,533 0.023 3870

LinkStrand: 16,777,216 32,477,819,013 0.051 3870

LinkStrand: 33,554,432 64,941,731,973 0.010 3870

LinkStrand: 67,108,864 129,869,557,893 0.011 3870

LinkStrand: 134,217,728 259,725,209,733 0.011 3870

LinkStrand: 268,435,456 519,436,513,413 0.013 3870

LinkStrand: 536,870,912 1,038,859,120,773 0.020 3870