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

Class
----- 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
3870
3870
3870
3870
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3870
3870
3870
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

Class	splicee	recomb	time	appends	
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:	134,217,728259,725,209,733	0.011	3870
LinkStrand:	268,435,456519,436,513,413	0.013	3870
LinkStrand:	536,870,9121,038,859,120,773	0.020	3870