C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2021.1.1\lib\idea\_rt.jar=58018:C:\Program Files\JetBrains\IntelliJ IDEA 2021.1.1\bin" -Dfile.encoding=UTF-8 -classpath C:\Users\cenon\IdeaProjects\cs333-fast-string-searching-algorithm\target\classes;C:\Users\cenon\.m2\repository\org\openjdk\jmh\jmh-core\1.26\jmh-core-1.26.jar;C:\Users\cenon\.m2\repository\net\sf\jopt-simple\jopt-simple\4.6\jopt-simple-4.6.jar;C:\Users\cenon\.m2\repository\org\apache\commons\commons-math3\3.2\commons-math3-3.2.jar;C:\Users\cenon\.m2\repository\org\openjdk\jmh\jmh-generator-annprocess\1.26\jmh-generator-annprocess-1.26.jar com.cs333.stringsearch.BenchmarkTests

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = )

# Run progress: 0.00% complete, ETA 00:00:00

# Fork: 1 of 1

Iteration 1: Boyer-Moore - Found instance of starting at character 1

4095772.000 ns/op

Iteration 2: Boyer-Moore - Found instance of starting at character 1

151486.000 ns/op

Iteration 3: Boyer-Moore - Found instance of starting at character 1

150508.000 ns/op

Iteration 4: Boyer-Moore - Found instance of starting at character 1

99803.000 ns/op

Iteration 5: Boyer-Moore - Found instance of starting at character 1

115029.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 922519.600 ±(99.9%) 6831211.957 ns/op

Histogram, ns/op:

[ 0.000, 500000.000) = 4

[ 500000.000, 1000000.000) = 0

[1000000.000, 1500000.000) = 0

[1500000.000, 2000000.000) = 0

[2000000.000, 2500000.000) = 0

[2500000.000, 3000000.000) = 0

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 1

Percentiles, ns/op:

p(0.0000) = 99803.000 ns/op

p(50.0000) = 150508.000 ns/op

p(90.0000) = 4095772.000 ns/op

p(95.0000) = 4095772.000 ns/op

p(99.0000) = 4095772.000 ns/op

p(99.9000) = 4095772.000 ns/op

p(99.9900) = 4095772.000 ns/op

p(99.9990) = 4095772.000 ns/op

p(99.9999) = 4095772.000 ns/op

p(100.0000) = 4095772.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = GCAGAGAG)

# Run progress: 2.78% complete, ETA 00:00:10

# Fork: 1 of 1

Iteration 1: 495384.000 ns/op

Iteration 2: 3842.000 ns/op

Iteration 3: 3352.000 ns/op

Iteration 4: 2793.000 ns/op

Iteration 5: 3701.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 101814.400 ±(99.9%) 847189.670 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 2793.000 ns/op

p(50.0000) = 3701.000 ns/op

p(90.0000) = 495384.000 ns/op

p(95.0000) = 495384.000 ns/op

p(99.0000) = 495384.000 ns/op

p(99.9000) = 495384.000 ns/op

p(99.9900) = 495384.000 ns/op

p(99.9990) = 495384.000 ns/op

p(99.9999) = 495384.000 ns/op

p(100.0000) = 495384.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = TEST)

# Run progress: 5.56% complete, ETA 00:00:09

# Fork: 1 of 1

Iteration 1: 479739.000 ns/op

Iteration 2: 4680.000 ns/op

Iteration 3: 2933.000 ns/op

Iteration 4: 2863.000 ns/op

Iteration 5: 2794.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 98601.800 ±(99.9%) 820432.173 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 2794.000 ns/op

p(50.0000) = 2933.000 ns/op

p(90.0000) = 479739.000 ns/op

p(95.0000) = 479739.000 ns/op

p(99.0000) = 479739.000 ns/op

p(99.9000) = 479739.000 ns/op

p(99.9900) = 479739.000 ns/op

p(99.9990) = 479739.000 ns/op

p(99.9999) = 479739.000 ns/op

p(100.0000) = 479739.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = )

# Run progress: 8.33% complete, ETA 00:00:08

# Fork: 1 of 1

Iteration 1: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

Boyer-Moore - Found instance of starting at character 4

Boyer-Moore - Found instance of starting at character 5

Boyer-Moore - Found instance of starting at character 6

Boyer-Moore - Found instance of starting at character 7

Boyer-Moore - Found instance of starting at character 8

Boyer-Moore - Found instance of starting at character 9

Boyer-Moore - Found instance of starting at character 10

Boyer-Moore - Found instance of starting at character 11

Boyer-Moore - Found instance of starting at character 12

Boyer-Moore - Found instance of starting at character 13

Boyer-Moore - Found instance of starting at character 14

Boyer-Moore - Found instance of starting at character 15

Boyer-Moore - Found instance of starting at character 16

Boyer-Moore - Found instance of starting at character 17

Boyer-Moore - Found instance of starting at character 18

Boyer-Moore - Found instance of starting at character 19

Boyer-Moore - Found instance of starting at character 20

Boyer-Moore - Found instance of starting at character 21

Boyer-Moore - Found instance of starting at character 22

Boyer-Moore - Found instance of starting at character 23

Boyer-Moore - Found instance of starting at character 24

Boyer-Moore - Found instance of starting at character 25

Boyer-Moore - Found instance of starting at character 26

Boyer-Moore - Found instance of starting at character 27

Boyer-Moore - Found instance of starting at character 28

Boyer-Moore - Found instance of starting at character 29

Boyer-Moore - Found instance of starting at character 30

Boyer-Moore - Found instance of starting at character 31

Boyer-Moore - Found instance of starting at character 32

Boyer-Moore - Found instance of starting at character 33

6362121.000 ns/op

Iteration 2: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

Boyer-Moore - Found instance of starting at character 4

Boyer-Moore - Found instance of starting at character 5

Boyer-Moore - Found instance of starting at character 6

Boyer-Moore - Found instance of starting at character 7

Boyer-Moore - Found instance of starting at character 8

Boyer-Moore - Found instance of starting at character 9

Boyer-Moore - Found instance of starting at character 10

Boyer-Moore - Found instance of starting at character 11

Boyer-Moore - Found instance of starting at character 12

Boyer-Moore - Found instance of starting at character 13

Boyer-Moore - Found instance of starting at character 14

Boyer-Moore - Found instance of starting at character 15

Boyer-Moore - Found instance of starting at character 16

Boyer-Moore - Found instance of starting at character 17

Boyer-Moore - Found instance of starting at character 18

Boyer-Moore - Found instance of starting at character 19

Boyer-Moore - Found instance of starting at character 20

Boyer-Moore - Found instance of starting at character 21

Boyer-Moore - Found instance of starting at character 22

Boyer-Moore - Found instance of starting at character 23

Boyer-Moore - Found instance of starting at character 24

Boyer-Moore - Found instance of starting at character 25

Boyer-Moore - Found instance of starting at character 26

Boyer-Moore - Found instance of starting at character 27

Boyer-Moore - Found instance of starting at character 28

Boyer-Moore - Found instance of starting at character 29

Boyer-Moore - Found instance of starting at character 30

Boyer-Moore - Found instance of starting at character 31

Boyer-Moore - Found instance of starting at character 32

Boyer-Moore - Found instance of starting at character 33

2547670.000 ns/op

Iteration 3: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

Boyer-Moore - Found instance of starting at character 4

Boyer-Moore - Found instance of starting at character 5

Boyer-Moore - Found instance of starting at character 6

Boyer-Moore - Found instance of starting at character 7

Boyer-Moore - Found instance of starting at character 8

Boyer-Moore - Found instance of starting at character 9

Boyer-Moore - Found instance of starting at character 10

Boyer-Moore - Found instance of starting at character 11

Boyer-Moore - Found instance of starting at character 12

Boyer-Moore - Found instance of starting at character 13

Boyer-Moore - Found instance of starting at character 14

Boyer-Moore - Found instance of starting at character 15

Boyer-Moore - Found instance of starting at character 16

Boyer-Moore - Found instance of starting at character 17

Boyer-Moore - Found instance of starting at character 18

Boyer-Moore - Found instance of starting at character 19

Boyer-Moore - Found instance of starting at character 20

Boyer-Moore - Found instance of starting at character 21

Boyer-Moore - Found instance of starting at character 22

Boyer-Moore - Found instance of starting at character 23

Boyer-Moore - Found instance of starting at character 24

Boyer-Moore - Found instance of starting at character 25

Boyer-Moore - Found instance of starting at character 26

Boyer-Moore - Found instance of starting at character 27

Boyer-Moore - Found instance of starting at character 28

Boyer-Moore - Found instance of starting at character 29

Boyer-Moore - Found instance of starting at character 30

Boyer-Moore - Found instance of starting at character 31

Boyer-Moore - Found instance of starting at character 32

Boyer-Moore - Found instance of starting at character 33

2169200.000 ns/op

Iteration 4: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

Boyer-Moore - Found instance of starting at character 4

Boyer-Moore - Found instance of starting at character 5

Boyer-Moore - Found instance of starting at character 6

Boyer-Moore - Found instance of starting at character 7

Boyer-Moore - Found instance of starting at character 8

Boyer-Moore - Found instance of starting at character 9

Boyer-Moore - Found instance of starting at character 10

Boyer-Moore - Found instance of starting at character 11

Boyer-Moore - Found instance of starting at character 12

Boyer-Moore - Found instance of starting at character 13

Boyer-Moore - Found instance of starting at character 14

Boyer-Moore - Found instance of starting at character 15

Boyer-Moore - Found instance of starting at character 16

Boyer-Moore - Found instance of starting at character 17

Boyer-Moore - Found instance of starting at character 18

Boyer-Moore - Found instance of starting at character 19

Boyer-Moore - Found instance of starting at character 20

Boyer-Moore - Found instance of starting at character 21

Boyer-Moore - Found instance of starting at character 22

Boyer-Moore - Found instance of starting at character 23

Boyer-Moore - Found instance of starting at character 24

Boyer-Moore - Found instance of starting at character 25

Boyer-Moore - Found instance of starting at character 26

Boyer-Moore - Found instance of starting at character 27

Boyer-Moore - Found instance of starting at character 28

Boyer-Moore - Found instance of starting at character 29

Boyer-Moore - Found instance of starting at character 30

Boyer-Moore - Found instance of starting at character 31

Boyer-Moore - Found instance of starting at character 32

Boyer-Moore - Found instance of starting at character 33

2163054.000 ns/op

Iteration 5: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

Boyer-Moore - Found instance of starting at character 4

Boyer-Moore - Found instance of starting at character 5

Boyer-Moore - Found instance of starting at character 6

Boyer-Moore - Found instance of starting at character 7

Boyer-Moore - Found instance of starting at character 8

Boyer-Moore - Found instance of starting at character 9

Boyer-Moore - Found instance of starting at character 10

Boyer-Moore - Found instance of starting at character 11

Boyer-Moore - Found instance of starting at character 12

Boyer-Moore - Found instance of starting at character 13

Boyer-Moore - Found instance of starting at character 14

Boyer-Moore - Found instance of starting at character 15

Boyer-Moore - Found instance of starting at character 16

Boyer-Moore - Found instance of starting at character 17

Boyer-Moore - Found instance of starting at character 18

Boyer-Moore - Found instance of starting at character 19

Boyer-Moore - Found instance of starting at character 20

Boyer-Moore - Found instance of starting at character 21

Boyer-Moore - Found instance of starting at character 22

Boyer-Moore - Found instance of starting at character 23

Boyer-Moore - Found instance of starting at character 24

Boyer-Moore - Found instance of starting at character 25

Boyer-Moore - Found instance of starting at character 26

Boyer-Moore - Found instance of starting at character 27

Boyer-Moore - Found instance of starting at character 28

Boyer-Moore - Found instance of starting at character 29

Boyer-Moore - Found instance of starting at character 30

Boyer-Moore - Found instance of starting at character 31

Boyer-Moore - Found instance of starting at character 32

Boyer-Moore - Found instance of starting at character 33

2217460.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 3091901.000 ±(99.9%) 7066038.413 ns/op

Histogram, ns/op:

[2000000.000, 2500000.000) = 3

[2500000.000, 3000000.000) = 1

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 0

[4500000.000, 5000000.000) = 0

[5000000.000, 5500000.000) = 0

[5500000.000, 6000000.000) = 0

[6000000.000, 6500000.000) = 1

Percentiles, ns/op:

p(0.0000) = 2163054.000 ns/op

p(50.0000) = 2217460.000 ns/op

p(90.0000) = 6362121.000 ns/op

p(95.0000) = 6362121.000 ns/op

p(99.0000) = 6362121.000 ns/op

p(99.9000) = 6362121.000 ns/op

p(99.9900) = 6362121.000 ns/op

p(99.9990) = 6362121.000 ns/op

p(99.9999) = 6362121.000 ns/op

p(100.0000) = 6362121.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = GCAGAGAG)

# Run progress: 11.11% complete, ETA 00:00:08

# Fork: 1 of 1

Iteration 1: Boyer-Moore - Found instance of GCAGAGAG starting at character 6

Boyer-Moore - Found instance of GCAGAGAG starting at character 25

4083480.000 ns/op

Iteration 2: Boyer-Moore - Found instance of GCAGAGAG starting at character 6

Boyer-Moore - Found instance of GCAGAGAG starting at character 25

244584.000 ns/op

Iteration 3: Boyer-Moore - Found instance of GCAGAGAG starting at character 6

Boyer-Moore - Found instance of GCAGAGAG starting at character 25

214832.000 ns/op

Iteration 4: Boyer-Moore - Found instance of GCAGAGAG starting at character 6

Boyer-Moore - Found instance of GCAGAGAG starting at character 25

190667.000 ns/op

Iteration 5: Boyer-Moore - Found instance of GCAGAGAG starting at character 6

Boyer-Moore - Found instance of GCAGAGAG starting at character 25

185358.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 983784.200 ±(99.9%) 6672938.664 ns/op

Histogram, ns/op:

[ 0.000, 500000.000) = 4

[ 500000.000, 1000000.000) = 0

[1000000.000, 1500000.000) = 0

[1500000.000, 2000000.000) = 0

[2000000.000, 2500000.000) = 0

[2500000.000, 3000000.000) = 0

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 1

Percentiles, ns/op:

p(0.0000) = 185358.000 ns/op

p(50.0000) = 214832.000 ns/op

p(90.0000) = 4083480.000 ns/op

p(95.0000) = 4083480.000 ns/op

p(99.0000) = 4083480.000 ns/op

p(99.9000) = 4083480.000 ns/op

p(99.9900) = 4083480.000 ns/op

p(99.9990) = 4083480.000 ns/op

p(99.9999) = 4083480.000 ns/op

p(100.0000) = 4083480.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = TEST)

# Run progress: 13.89% complete, ETA 00:00:07

# Fork: 1 of 1

Iteration 1: 472267.000 ns/op

Iteration 2: 10895.000 ns/op

Iteration 3: 9009.000 ns/op

Iteration 4: 16064.000 ns/op

Iteration 5: 9009.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 103448.800 ±(99.9%) 793986.824 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 9009.000 ns/op

p(50.0000) = 10895.000 ns/op

p(90.0000) = 472267.000 ns/op

p(95.0000) = 472267.000 ns/op

p(99.0000) = 472267.000 ns/op

p(99.9000) = 472267.000 ns/op

p(99.9900) = 472267.000 ns/op

p(99.9990) = 472267.000 ns/op

p(99.9999) = 472267.000 ns/op

p(100.0000) = 472267.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = )

# Run progress: 16.67% complete, ETA 00:00:07

# Fork: 1 of 1

Iteration 1: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

Boyer-Moore - Found instance of starting at character 4

Boyer-Moore - Found instance of starting at character 5

Boyer-Moore - Found instance of starting at character 6

Boyer-Moore - Found instance of starting at character 7

Boyer-Moore - Found instance of starting at character 8

Boyer-Moore - Found instance of starting at character 9

Boyer-Moore - Found instance of starting at character 10

Boyer-Moore - Found instance of starting at character 11

Boyer-Moore - Found instance of starting at character 12

Boyer-Moore - Found instance of starting at character 13

Boyer-Moore - Found instance of starting at character 14

Boyer-Moore - Found instance of starting at character 15

Boyer-Moore - Found instance of starting at character 16

Boyer-Moore - Found instance of starting at character 17

Boyer-Moore - Found instance of starting at character 18

Boyer-Moore - Found instance of starting at character 19

Boyer-Moore - Found instance of starting at character 20

Boyer-Moore - Found instance of starting at character 21

Boyer-Moore - Found instance of starting at character 22

Boyer-Moore - Found instance of starting at character 23

Boyer-Moore - Found instance of starting at character 24

Boyer-Moore - Found instance of starting at character 25

Boyer-Moore - Found instance of starting at character 26

Boyer-Moore - Found instance of starting at character 27

Boyer-Moore - Found instance of starting at character 28

Boyer-Moore - Found instance of starting at character 29

Boyer-Moore - Found instance of starting at character 30

Boyer-Moore - Found instance of starting at character 31

Boyer-Moore - Found instance of starting at character 32

Boyer-Moore - Found instance of starting at character 33

Boyer-Moore - Found instance of starting at character 34

Boyer-Moore - Found instance of starting at character 35

Boyer-Moore - Found instance of starting at character 36

Boyer-Moore - Found instance of starting at character 37

Boyer-Moore - Found instance of starting at character 38

Boyer-Moore - Found instance of starting at character 39

Boyer-Moore - Found instance of starting at character 40

Boyer-Moore - Found instance of starting at character 41

Boyer-Moore - Found instance of starting at character 42

Boyer-Moore - Found instance of starting at character 43

Boyer-Moore - Found instance of starting at character 44

Boyer-Moore - Found instance of starting at character 45

Boyer-Moore - Found instance of starting at character 46

Boyer-Moore - Found instance of starting at character 47

Boyer-Moore - Found instance of starting at character 48

Boyer-Moore - Found instance of starting at character 49

Boyer-Moore - Found instance of starting at character 50

Boyer-Moore - Found instance of starting at character 51

Boyer-Moore - Found instance of starting at character 52

Boyer-Moore - Found instance of starting at character 53

Boyer-Moore - Found instance of starting at character 54

Boyer-Moore - Found instance of starting at character 55

Boyer-Moore - Found instance of starting at character 56

Boyer-Moore - Found instance of starting at character 57

Boyer-Moore - Found instance of starting at character 58

Boyer-Moore - Found instance of starting at character 59

Boyer-Moore - Found instance of starting at character 60

Boyer-Moore - Found instance of starting at character 61

Boyer-Moore - Found instance of starting at character 62

Boyer-Moore - Found instance of starting at character 63

Boyer-Moore - Found instance of starting at character 64

Boyer-Moore - Found instance of starting at character 65

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Iteration 2: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

Boyer-Moore - Found instance of starting at character 4

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Boyer-Moore - Found instance of starting at character 151

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Iteration 3: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

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Iteration 4: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

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Boyer-Moore - Found instance of starting at character 146

Boyer-Moore - Found instance of starting at character 147

Boyer-Moore - Found instance of starting at character 148

Boyer-Moore - Found instance of starting at character 149

Boyer-Moore - Found instance of starting at character 150

Boyer-Moore - Found instance of starting at character 151

Boyer-Moore - Found instance of starting at character 152

Boyer-Moore - Found instance of starting at character 153

4376813.000 ns/op

Iteration 5: Boyer-Moore - Found instance of starting at character 1

Boyer-Moore - Found instance of starting at character 2

Boyer-Moore - Found instance of starting at character 3

Boyer-Moore - Found instance of starting at character 4

Boyer-Moore - Found instance of starting at character 5

Boyer-Moore - Found instance of starting at character 6

Boyer-Moore - Found instance of starting at character 7

Boyer-Moore - Found instance of starting at character 8

Boyer-Moore - Found instance of starting at character 9

Boyer-Moore - Found instance of starting at character 10

Boyer-Moore - Found instance of starting at character 11

Boyer-Moore - Found instance of starting at character 12

Boyer-Moore - Found instance of starting at character 13

Boyer-Moore - Found instance of starting at character 14

Boyer-Moore - Found instance of starting at character 15

Boyer-Moore - Found instance of starting at character 16

Boyer-Moore - Found instance of starting at character 17

Boyer-Moore - Found instance of starting at character 18

Boyer-Moore - Found instance of starting at character 19

Boyer-Moore - Found instance of starting at character 20

Boyer-Moore - Found instance of starting at character 21

Boyer-Moore - Found instance of starting at character 22

Boyer-Moore - Found instance of starting at character 23

Boyer-Moore - Found instance of starting at character 24

Boyer-Moore - Found instance of starting at character 25

Boyer-Moore - Found instance of starting at character 26

Boyer-Moore - Found instance of starting at character 27

Boyer-Moore - Found instance of starting at character 28

Boyer-Moore - Found instance of starting at character 29

Boyer-Moore - Found instance of starting at character 30

Boyer-Moore - Found instance of starting at character 31

Boyer-Moore - Found instance of starting at character 32

Boyer-Moore - Found instance of starting at character 33

Boyer-Moore - Found instance of starting at character 34

Boyer-Moore - Found instance of starting at character 35

Boyer-Moore - Found instance of starting at character 36

Boyer-Moore - Found instance of starting at character 37

Boyer-Moore - Found instance of starting at character 38

Boyer-Moore - Found instance of starting at character 39

Boyer-Moore - Found instance of starting at character 40

Boyer-Moore - Found instance of starting at character 41

Boyer-Moore - Found instance of starting at character 42

Boyer-Moore - Found instance of starting at character 43

Boyer-Moore - Found instance of starting at character 44

Boyer-Moore - Found instance of starting at character 45

Boyer-Moore - Found instance of starting at character 46

Boyer-Moore - Found instance of starting at character 47

Boyer-Moore - Found instance of starting at character 48

Boyer-Moore - Found instance of starting at character 49

Boyer-Moore - Found instance of starting at character 50

Boyer-Moore - Found instance of starting at character 51

Boyer-Moore - Found instance of starting at character 52

Boyer-Moore - Found instance of starting at character 53

Boyer-Moore - Found instance of starting at character 54

Boyer-Moore - Found instance of starting at character 55

Boyer-Moore - Found instance of starting at character 56

Boyer-Moore - Found instance of starting at character 57

Boyer-Moore - Found instance of starting at character 58

Boyer-Moore - Found instance of starting at character 59

Boyer-Moore - Found instance of starting at character 60

Boyer-Moore - Found instance of starting at character 61

Boyer-Moore - Found instance of starting at character 62

Boyer-Moore - Found instance of starting at character 63

Boyer-Moore - Found instance of starting at character 64

Boyer-Moore - Found instance of starting at character 65

Boyer-Moore - Found instance of starting at character 66

Boyer-Moore - Found instance of starting at character 67

Boyer-Moore - Found instance of starting at character 68

Boyer-Moore - Found instance of starting at character 69

Boyer-Moore - Found instance of starting at character 70

Boyer-Moore - Found instance of starting at character 71

Boyer-Moore - Found instance of starting at character 72

Boyer-Moore - Found instance of starting at character 73

Boyer-Moore - Found instance of starting at character 74

Boyer-Moore - Found instance of starting at character 75

Boyer-Moore - Found instance of starting at character 76

Boyer-Moore - Found instance of starting at character 77

Boyer-Moore - Found instance of starting at character 78

Boyer-Moore - Found instance of starting at character 79

Boyer-Moore - Found instance of starting at character 80

Boyer-Moore - Found instance of starting at character 81

Boyer-Moore - Found instance of starting at character 82

Boyer-Moore - Found instance of starting at character 83

Boyer-Moore - Found instance of starting at character 84

Boyer-Moore - Found instance of starting at character 85

Boyer-Moore - Found instance of starting at character 86

Boyer-Moore - Found instance of starting at character 87

Boyer-Moore - Found instance of starting at character 88

Boyer-Moore - Found instance of starting at character 89

Boyer-Moore - Found instance of starting at character 90

Boyer-Moore - Found instance of starting at character 91

Boyer-Moore - Found instance of starting at character 92

Boyer-Moore - Found instance of starting at character 93

Boyer-Moore - Found instance of starting at character 94

Boyer-Moore - Found instance of starting at character 95

Boyer-Moore - Found instance of starting at character 96

Boyer-Moore - Found instance of starting at character 97

Boyer-Moore - Found instance of starting at character 98

Boyer-Moore - Found instance of starting at character 99

Boyer-Moore - Found instance of starting at character 100

Boyer-Moore - Found instance of starting at character 101

Boyer-Moore - Found instance of starting at character 102

Boyer-Moore - Found instance of starting at character 103

Boyer-Moore - Found instance of starting at character 104

Boyer-Moore - Found instance of starting at character 105

Boyer-Moore - Found instance of starting at character 106

Boyer-Moore - Found instance of starting at character 107

Boyer-Moore - Found instance of starting at character 108

Boyer-Moore - Found instance of starting at character 109

Boyer-Moore - Found instance of starting at character 110

Boyer-Moore - Found instance of starting at character 111

Boyer-Moore - Found instance of starting at character 112

Boyer-Moore - Found instance of starting at character 113

Boyer-Moore - Found instance of starting at character 114

Boyer-Moore - Found instance of starting at character 115

Boyer-Moore - Found instance of starting at character 116

Boyer-Moore - Found instance of starting at character 117

Boyer-Moore - Found instance of starting at character 118

Boyer-Moore - Found instance of starting at character 119

Boyer-Moore - Found instance of starting at character 120

Boyer-Moore - Found instance of starting at character 121

Boyer-Moore - Found instance of starting at character 122

Boyer-Moore - Found instance of starting at character 123

Boyer-Moore - Found instance of starting at character 124

Boyer-Moore - Found instance of starting at character 125

Boyer-Moore - Found instance of starting at character 126

Boyer-Moore - Found instance of starting at character 127

Boyer-Moore - Found instance of starting at character 128

Boyer-Moore - Found instance of starting at character 129

Boyer-Moore - Found instance of starting at character 130

Boyer-Moore - Found instance of starting at character 131

Boyer-Moore - Found instance of starting at character 132

Boyer-Moore - Found instance of starting at character 133

Boyer-Moore - Found instance of starting at character 134

Boyer-Moore - Found instance of starting at character 135

Boyer-Moore - Found instance of starting at character 136

Boyer-Moore - Found instance of starting at character 137

Boyer-Moore - Found instance of starting at character 138

Boyer-Moore - Found instance of starting at character 139

Boyer-Moore - Found instance of starting at character 140

Boyer-Moore - Found instance of starting at character 141

Boyer-Moore - Found instance of starting at character 142

Boyer-Moore - Found instance of starting at character 143

Boyer-Moore - Found instance of starting at character 144

Boyer-Moore - Found instance of starting at character 145

Boyer-Moore - Found instance of starting at character 146

Boyer-Moore - Found instance of starting at character 147

Boyer-Moore - Found instance of starting at character 148

Boyer-Moore - Found instance of starting at character 149

Boyer-Moore - Found instance of starting at character 150

Boyer-Moore - Found instance of starting at character 151

Boyer-Moore - Found instance of starting at character 152

Boyer-Moore - Found instance of starting at character 153

5695905.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 7911969.400 ±(99.9%) 16726404.448 ns/op

Histogram, ns/op:

[ 0.000, 1250000.000) = 0

[ 1250000.000, 2500000.000) = 0

[ 2500000.000, 3750000.000) = 0

[ 3750000.000, 5000000.000) = 1

[ 5000000.000, 6250000.000) = 2

[ 6250000.000, 7500000.000) = 0

[ 7500000.000, 8750000.000) = 1

[ 8750000.000, 10000000.000) = 0

[10000000.000, 11250000.000) = 0

[11250000.000, 12500000.000) = 0

[12500000.000, 13750000.000) = 0

[13750000.000, 15000000.000) = 0

[15000000.000, 16250000.000) = 1

[16250000.000, 17500000.000) = 0

[17500000.000, 18750000.000) = 0

Percentiles, ns/op:

p(0.0000) = 4376813.000 ns/op

p(50.0000) = 6195481.000 ns/op

p(90.0000) = 15336098.000 ns/op

p(95.0000) = 15336098.000 ns/op

p(99.0000) = 15336098.000 ns/op

p(99.9000) = 15336098.000 ns/op

p(99.9900) = 15336098.000 ns/op

p(99.9990) = 15336098.000 ns/op

p(99.9999) = 15336098.000 ns/op

p(100.0000) = 15336098.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = GCAGAGAG)

# Run progress: 19.44% complete, ETA 00:00:07

# Fork: 1 of 1

Iteration 1: 435740.000 ns/op

Iteration 2: 10826.000 ns/op

Iteration 3: 8520.000 ns/op

Iteration 4: 10407.000 ns/op

Iteration 5: 9498.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 94998.200 ±(99.9%) 733480.375 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 8520.000 ns/op

p(50.0000) = 10407.000 ns/op

p(90.0000) = 435740.000 ns/op

p(95.0000) = 435740.000 ns/op

p(99.0000) = 435740.000 ns/op

p(99.9000) = 435740.000 ns/op

p(99.9900) = 435740.000 ns/op

p(99.9990) = 435740.000 ns/op

p(99.9999) = 435740.000 ns/op

p(100.0000) = 435740.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureBM

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = TEST)

# Run progress: 22.22% complete, ETA 00:00:06

# Fork: 1 of 1

Iteration 1: Boyer-Moore - Found instance of TEST starting at character 1

Boyer-Moore - Found instance of TEST starting at character 9

Boyer-Moore - Found instance of TEST starting at character 17

Boyer-Moore - Found instance of TEST starting at character 25

Boyer-Moore - Found instance of TEST starting at character 33

Boyer-Moore - Found instance of TEST starting at character 41

Boyer-Moore - Found instance of TEST starting at character 49

Boyer-Moore - Found instance of TEST starting at character 57

Boyer-Moore - Found instance of TEST starting at character 65

Boyer-Moore - Found instance of TEST starting at character 73

Boyer-Moore - Found instance of TEST starting at character 81

Boyer-Moore - Found instance of TEST starting at character 89

Boyer-Moore - Found instance of TEST starting at character 97

Boyer-Moore - Found instance of TEST starting at character 105

Boyer-Moore - Found instance of TEST starting at character 113

Boyer-Moore - Found instance of TEST starting at character 121

Boyer-Moore - Found instance of TEST starting at character 129

Boyer-Moore - Found instance of TEST starting at character 137

Boyer-Moore - Found instance of TEST starting at character 145

5682216.000 ns/op

Iteration 2: Boyer-Moore - Found instance of TEST starting at character 1

Boyer-Moore - Found instance of TEST starting at character 9

Boyer-Moore - Found instance of TEST starting at character 17

Boyer-Moore - Found instance of TEST starting at character 25

Boyer-Moore - Found instance of TEST starting at character 33

Boyer-Moore - Found instance of TEST starting at character 41

Boyer-Moore - Found instance of TEST starting at character 49

Boyer-Moore - Found instance of TEST starting at character 57

Boyer-Moore - Found instance of TEST starting at character 65

Boyer-Moore - Found instance of TEST starting at character 73

Boyer-Moore - Found instance of TEST starting at character 81

Boyer-Moore - Found instance of TEST starting at character 89

Boyer-Moore - Found instance of TEST starting at character 97

Boyer-Moore - Found instance of TEST starting at character 105

Boyer-Moore - Found instance of TEST starting at character 113

Boyer-Moore - Found instance of TEST starting at character 121

Boyer-Moore - Found instance of TEST starting at character 129

Boyer-Moore - Found instance of TEST starting at character 137

Boyer-Moore - Found instance of TEST starting at character 145

1845206.000 ns/op

Iteration 3: Boyer-Moore - Found instance of TEST starting at character 1

Boyer-Moore - Found instance of TEST starting at character 9

Boyer-Moore - Found instance of TEST starting at character 17

Boyer-Moore - Found instance of TEST starting at character 25

Boyer-Moore - Found instance of TEST starting at character 33

Boyer-Moore - Found instance of TEST starting at character 41

Boyer-Moore - Found instance of TEST starting at character 49

Boyer-Moore - Found instance of TEST starting at character 57

Boyer-Moore - Found instance of TEST starting at character 65

Boyer-Moore - Found instance of TEST starting at character 73

Boyer-Moore - Found instance of TEST starting at character 81

Boyer-Moore - Found instance of TEST starting at character 89

Boyer-Moore - Found instance of TEST starting at character 97

Boyer-Moore - Found instance of TEST starting at character 105

Boyer-Moore - Found instance of TEST starting at character 113

Boyer-Moore - Found instance of TEST starting at character 121

Boyer-Moore - Found instance of TEST starting at character 129

Boyer-Moore - Found instance of TEST starting at character 137

Boyer-Moore - Found instance of TEST starting at character 145

1507873.000 ns/op

Iteration 4: Boyer-Moore - Found instance of TEST starting at character 1

Boyer-Moore - Found instance of TEST starting at character 9

Boyer-Moore - Found instance of TEST starting at character 17

Boyer-Moore - Found instance of TEST starting at character 25

Boyer-Moore - Found instance of TEST starting at character 33

Boyer-Moore - Found instance of TEST starting at character 41

Boyer-Moore - Found instance of TEST starting at character 49

Boyer-Moore - Found instance of TEST starting at character 57

Boyer-Moore - Found instance of TEST starting at character 65

Boyer-Moore - Found instance of TEST starting at character 73

Boyer-Moore - Found instance of TEST starting at character 81

Boyer-Moore - Found instance of TEST starting at character 89

Boyer-Moore - Found instance of TEST starting at character 97

Boyer-Moore - Found instance of TEST starting at character 105

Boyer-Moore - Found instance of TEST starting at character 113

Boyer-Moore - Found instance of TEST starting at character 121

Boyer-Moore - Found instance of TEST starting at character 129

Boyer-Moore - Found instance of TEST starting at character 137

Boyer-Moore - Found instance of TEST starting at character 145

1243385.000 ns/op

Iteration 5: Boyer-Moore - Found instance of TEST starting at character 1

Boyer-Moore - Found instance of TEST starting at character 9

Boyer-Moore - Found instance of TEST starting at character 17

Boyer-Moore - Found instance of TEST starting at character 25

Boyer-Moore - Found instance of TEST starting at character 33

Boyer-Moore - Found instance of TEST starting at character 41

Boyer-Moore - Found instance of TEST starting at character 49

Boyer-Moore - Found instance of TEST starting at character 57

Boyer-Moore - Found instance of TEST starting at character 65

Boyer-Moore - Found instance of TEST starting at character 73

Boyer-Moore - Found instance of TEST starting at character 81

Boyer-Moore - Found instance of TEST starting at character 89

Boyer-Moore - Found instance of TEST starting at character 97

Boyer-Moore - Found instance of TEST starting at character 105

Boyer-Moore - Found instance of TEST starting at character 113

Boyer-Moore - Found instance of TEST starting at character 121

Boyer-Moore - Found instance of TEST starting at character 129

Boyer-Moore - Found instance of TEST starting at character 137

Boyer-Moore - Found instance of TEST starting at character 145

1298699.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureBM":

N = 5

mean = 2315475.800 ±(99.9%) 7303933.968 ns/op

Histogram, ns/op:

[1000000.000, 1500000.000) = 2

[1500000.000, 2000000.000) = 2

[2000000.000, 2500000.000) = 0

[2500000.000, 3000000.000) = 0

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 0

[4500000.000, 5000000.000) = 0

[5000000.000, 5500000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1243385.000 ns/op

p(50.0000) = 1507873.000 ns/op

p(90.0000) = 5682216.000 ns/op

p(95.0000) = 5682216.000 ns/op

p(99.0000) = 5682216.000 ns/op

p(99.9000) = 5682216.000 ns/op

p(99.9900) = 5682216.000 ns/op

p(99.9990) = 5682216.000 ns/op

p(99.9999) = 5682216.000 ns/op

p(100.0000) = 5682216.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = )

# Run progress: 25.00% complete, ETA 00:00:06

# Fork: 1 of 1

Iteration 1: 429105.000 ns/op

Iteration 2: 2305.000 ns/op

Iteration 3: 1956.000 ns/op

Iteration 4: 2375.000 ns/op

Iteration 5: 1467.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 87441.600 ±(99.9%) 735457.531 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1467.000 ns/op

p(50.0000) = 2305.000 ns/op

p(90.0000) = 429105.000 ns/op

p(95.0000) = 429105.000 ns/op

p(99.0000) = 429105.000 ns/op

p(99.9000) = 429105.000 ns/op

p(99.9900) = 429105.000 ns/op

p(99.9990) = 429105.000 ns/op

p(99.9999) = 429105.000 ns/op

p(100.0000) = 429105.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = GCAGAGAG)

# Run progress: 27.78% complete, ETA 00:00:06

# Fork: 1 of 1

Iteration 1: 427149.000 ns/op

Iteration 2: 1956.000 ns/op

Iteration 3: 1885.000 ns/op

Iteration 4: 1955.000 ns/op

Iteration 5: 1467.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 86882.400 ±(99.9%) 732449.930 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1467.000 ns/op

p(50.0000) = 1955.000 ns/op

p(90.0000) = 427149.000 ns/op

p(95.0000) = 427149.000 ns/op

p(99.0000) = 427149.000 ns/op

p(99.9000) = 427149.000 ns/op

p(99.9900) = 427149.000 ns/op

p(99.9990) = 427149.000 ns/op

p(99.9999) = 427149.000 ns/op

p(100.0000) = 427149.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = TEST)

# Run progress: 30.56% complete, ETA 00:00:06

# Fork: 1 of 1

Iteration 1: 418768.000 ns/op

Iteration 2: 2375.000 ns/op

Iteration 3: 1886.000 ns/op

Iteration 4: 1467.000 ns/op

Iteration 5: 1397.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 85178.600 ±(99.9%) 718077.909 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1397.000 ns/op

p(50.0000) = 1886.000 ns/op

p(90.0000) = 418768.000 ns/op

p(95.0000) = 418768.000 ns/op

p(99.0000) = 418768.000 ns/op

p(99.9000) = 418768.000 ns/op

p(99.9900) = 418768.000 ns/op

p(99.9990) = 418768.000 ns/op

p(99.9999) = 418768.000 ns/op

p(100.0000) = 418768.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = )

# Run progress: 33.33% complete, ETA 00:00:05

# Fork: 1 of 1

Iteration 1: 429594.000 ns/op

Iteration 2: 1886.000 ns/op

Iteration 3: 2794.000 ns/op

Iteration 4: 1816.000 ns/op

Iteration 5: 1955.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 87609.000 ±(99.9%) 736150.079 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1816.000 ns/op

p(50.0000) = 1955.000 ns/op

p(90.0000) = 429594.000 ns/op

p(95.0000) = 429594.000 ns/op

p(99.0000) = 429594.000 ns/op

p(99.9000) = 429594.000 ns/op

p(99.9900) = 429594.000 ns/op

p(99.9990) = 429594.000 ns/op

p(99.9999) = 429594.000 ns/op

p(100.0000) = 429594.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = GCAGAGAG)

# Run progress: 36.11% complete, ETA 00:00:05

# Fork: 1 of 1

Iteration 1: Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 6

Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 25

3777854.000 ns/op

Iteration 2: Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 6

Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 25

220000.000 ns/op

Iteration 3: Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 6

Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 25

210083.000 ns/op

Iteration 4: Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 6

Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 25

214762.000 ns/op

Iteration 5: Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 6

Knuth-Morris-Pratt - Found instance of GCAGAGAG starting at character 25

192972.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 923134.200 ±(99.9%) 6145123.699 ns/op

Histogram, ns/op:

[ 0.000, 250000.000) = 4

[ 250000.000, 500000.000) = 0

[ 500000.000, 750000.000) = 0

[ 750000.000, 1000000.000) = 0

[1000000.000, 1250000.000) = 0

[1250000.000, 1500000.000) = 0

[1500000.000, 1750000.000) = 0

[1750000.000, 2000000.000) = 0

[2000000.000, 2250000.000) = 0

[2250000.000, 2500000.000) = 0

[2500000.000, 2750000.000) = 0

[2750000.000, 3000000.000) = 0

[3000000.000, 3250000.000) = 0

[3250000.000, 3500000.000) = 0

[3500000.000, 3750000.000) = 0

Percentiles, ns/op:

p(0.0000) = 192972.000 ns/op

p(50.0000) = 214762.000 ns/op

p(90.0000) = 3777854.000 ns/op

p(95.0000) = 3777854.000 ns/op

p(99.0000) = 3777854.000 ns/op

p(99.9000) = 3777854.000 ns/op

p(99.9900) = 3777854.000 ns/op

p(99.9990) = 3777854.000 ns/op

p(99.9999) = 3777854.000 ns/op

p(100.0000) = 3777854.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = TEST)

# Run progress: 38.89% complete, ETA 00:00:05

# Fork: 1 of 1

Iteration 1: 431549.000 ns/op

Iteration 2: 8520.000 ns/op

Iteration 3: 8520.000 ns/op

Iteration 4: 9917.000 ns/op

Iteration 5: 5727.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 92846.600 ±(99.9%) 729106.006 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 5727.000 ns/op

p(50.0000) = 8520.000 ns/op

p(90.0000) = 431549.000 ns/op

p(95.0000) = 431549.000 ns/op

p(99.0000) = 431549.000 ns/op

p(99.9000) = 431549.000 ns/op

p(99.9900) = 431549.000 ns/op

p(99.9990) = 431549.000 ns/op

p(99.9999) = 431549.000 ns/op

p(100.0000) = 431549.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = )

# Run progress: 41.67% complete, ETA 00:00:05

# Fork: 1 of 1

Iteration 1: 473524.000 ns/op

Iteration 2: 1955.000 ns/op

Iteration 3: 2375.000 ns/op

Iteration 4: 1885.000 ns/op

Iteration 5: 1885.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 96324.800 ±(99.9%) 811950.097 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1885.000 ns/op

p(50.0000) = 1955.000 ns/op

p(90.0000) = 473524.000 ns/op

p(95.0000) = 473524.000 ns/op

p(99.0000) = 473524.000 ns/op

p(99.9000) = 473524.000 ns/op

p(99.9900) = 473524.000 ns/op

p(99.9990) = 473524.000 ns/op

p(99.9999) = 473524.000 ns/op

p(100.0000) = 473524.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = GCAGAGAG)

# Run progress: 44.44% complete, ETA 00:00:04

# Fork: 1 of 1

Iteration 1: 431549.000 ns/op

Iteration 2: 16971.000 ns/op

Iteration 3: 24584.000 ns/op

Iteration 4: 16622.000 ns/op

Iteration 5: 24095.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 102764.200 ±(99.9%) 707883.531 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 16622.000 ns/op

p(50.0000) = 24095.000 ns/op

p(90.0000) = 431549.000 ns/op

p(95.0000) = 431549.000 ns/op

p(99.0000) = 431549.000 ns/op

p(99.9000) = 431549.000 ns/op

p(99.9900) = 431549.000 ns/op

p(99.9990) = 431549.000 ns/op

p(99.9999) = 431549.000 ns/op

p(100.0000) = 431549.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKMP

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = TEST)

# Run progress: 47.22% complete, ETA 00:00:04

# Fork: 1 of 1

Iteration 1: Knuth-Morris-Pratt - Found instance of TEST starting at character 1

Knuth-Morris-Pratt - Found instance of TEST starting at character 5

Knuth-Morris-Pratt - Found instance of TEST starting at character 9

Knuth-Morris-Pratt - Found instance of TEST starting at character 13

Knuth-Morris-Pratt - Found instance of TEST starting at character 17

Knuth-Morris-Pratt - Found instance of TEST starting at character 21

Knuth-Morris-Pratt - Found instance of TEST starting at character 25

Knuth-Morris-Pratt - Found instance of TEST starting at character 29

Knuth-Morris-Pratt - Found instance of TEST starting at character 33

Knuth-Morris-Pratt - Found instance of TEST starting at character 37

Knuth-Morris-Pratt - Found instance of TEST starting at character 41

Knuth-Morris-Pratt - Found instance of TEST starting at character 45

Knuth-Morris-Pratt - Found instance of TEST starting at character 49

Knuth-Morris-Pratt - Found instance of TEST starting at character 53

Knuth-Morris-Pratt - Found instance of TEST starting at character 57

Knuth-Morris-Pratt - Found instance of TEST starting at character 61

Knuth-Morris-Pratt - Found instance of TEST starting at character 65

Knuth-Morris-Pratt - Found instance of TEST starting at character 69

Knuth-Morris-Pratt - Found instance of TEST starting at character 73

Knuth-Morris-Pratt - Found instance of TEST starting at character 77

Knuth-Morris-Pratt - Found instance of TEST starting at character 81

Knuth-Morris-Pratt - Found instance of TEST starting at character 85

Knuth-Morris-Pratt - Found instance of TEST starting at character 89

Knuth-Morris-Pratt - Found instance of TEST starting at character 93

Knuth-Morris-Pratt - Found instance of TEST starting at character 97

Knuth-Morris-Pratt - Found instance of TEST starting at character 101

Knuth-Morris-Pratt - Found instance of TEST starting at character 105

Knuth-Morris-Pratt - Found instance of TEST starting at character 109

Knuth-Morris-Pratt - Found instance of TEST starting at character 113

Knuth-Morris-Pratt - Found instance of TEST starting at character 117

Knuth-Morris-Pratt - Found instance of TEST starting at character 121

Knuth-Morris-Pratt - Found instance of TEST starting at character 125

Knuth-Morris-Pratt - Found instance of TEST starting at character 129

Knuth-Morris-Pratt - Found instance of TEST starting at character 133

Knuth-Morris-Pratt - Found instance of TEST starting at character 137

Knuth-Morris-Pratt - Found instance of TEST starting at character 141

Knuth-Morris-Pratt - Found instance of TEST starting at character 145

Knuth-Morris-Pratt - Found instance of TEST starting at character 149

6852617.000 ns/op

Iteration 2: Knuth-Morris-Pratt - Found instance of TEST starting at character 1

Knuth-Morris-Pratt - Found instance of TEST starting at character 5

Knuth-Morris-Pratt - Found instance of TEST starting at character 9

Knuth-Morris-Pratt - Found instance of TEST starting at character 13

Knuth-Morris-Pratt - Found instance of TEST starting at character 17

Knuth-Morris-Pratt - Found instance of TEST starting at character 21

Knuth-Morris-Pratt - Found instance of TEST starting at character 25

Knuth-Morris-Pratt - Found instance of TEST starting at character 29

Knuth-Morris-Pratt - Found instance of TEST starting at character 33

Knuth-Morris-Pratt - Found instance of TEST starting at character 37

Knuth-Morris-Pratt - Found instance of TEST starting at character 41

Knuth-Morris-Pratt - Found instance of TEST starting at character 45

Knuth-Morris-Pratt - Found instance of TEST starting at character 49

Knuth-Morris-Pratt - Found instance of TEST starting at character 53

Knuth-Morris-Pratt - Found instance of TEST starting at character 57

Knuth-Morris-Pratt - Found instance of TEST starting at character 61

Knuth-Morris-Pratt - Found instance of TEST starting at character 65

Knuth-Morris-Pratt - Found instance of TEST starting at character 69

Knuth-Morris-Pratt - Found instance of TEST starting at character 73

Knuth-Morris-Pratt - Found instance of TEST starting at character 77

Knuth-Morris-Pratt - Found instance of TEST starting at character 81

Knuth-Morris-Pratt - Found instance of TEST starting at character 85

Knuth-Morris-Pratt - Found instance of TEST starting at character 89

Knuth-Morris-Pratt - Found instance of TEST starting at character 93

Knuth-Morris-Pratt - Found instance of TEST starting at character 97

Knuth-Morris-Pratt - Found instance of TEST starting at character 101

Knuth-Morris-Pratt - Found instance of TEST starting at character 105

Knuth-Morris-Pratt - Found instance of TEST starting at character 109

Knuth-Morris-Pratt - Found instance of TEST starting at character 113

Knuth-Morris-Pratt - Found instance of TEST starting at character 117

Knuth-Morris-Pratt - Found instance of TEST starting at character 121

Knuth-Morris-Pratt - Found instance of TEST starting at character 125

Knuth-Morris-Pratt - Found instance of TEST starting at character 129

Knuth-Morris-Pratt - Found instance of TEST starting at character 133

Knuth-Morris-Pratt - Found instance of TEST starting at character 137

Knuth-Morris-Pratt - Found instance of TEST starting at character 141

Knuth-Morris-Pratt - Found instance of TEST starting at character 145

Knuth-Morris-Pratt - Found instance of TEST starting at character 149

2730375.000 ns/op

Iteration 3: Knuth-Morris-Pratt - Found instance of TEST starting at character 1

Knuth-Morris-Pratt - Found instance of TEST starting at character 5

Knuth-Morris-Pratt - Found instance of TEST starting at character 9

Knuth-Morris-Pratt - Found instance of TEST starting at character 13

Knuth-Morris-Pratt - Found instance of TEST starting at character 17

Knuth-Morris-Pratt - Found instance of TEST starting at character 21

Knuth-Morris-Pratt - Found instance of TEST starting at character 25

Knuth-Morris-Pratt - Found instance of TEST starting at character 29

Knuth-Morris-Pratt - Found instance of TEST starting at character 33

Knuth-Morris-Pratt - Found instance of TEST starting at character 37

Knuth-Morris-Pratt - Found instance of TEST starting at character 41

Knuth-Morris-Pratt - Found instance of TEST starting at character 45

Knuth-Morris-Pratt - Found instance of TEST starting at character 49

Knuth-Morris-Pratt - Found instance of TEST starting at character 53

Knuth-Morris-Pratt - Found instance of TEST starting at character 57

Knuth-Morris-Pratt - Found instance of TEST starting at character 61

Knuth-Morris-Pratt - Found instance of TEST starting at character 65

Knuth-Morris-Pratt - Found instance of TEST starting at character 69

Knuth-Morris-Pratt - Found instance of TEST starting at character 73

Knuth-Morris-Pratt - Found instance of TEST starting at character 77

Knuth-Morris-Pratt - Found instance of TEST starting at character 81

Knuth-Morris-Pratt - Found instance of TEST starting at character 85

Knuth-Morris-Pratt - Found instance of TEST starting at character 89

Knuth-Morris-Pratt - Found instance of TEST starting at character 93

Knuth-Morris-Pratt - Found instance of TEST starting at character 97

Knuth-Morris-Pratt - Found instance of TEST starting at character 101

Knuth-Morris-Pratt - Found instance of TEST starting at character 105

Knuth-Morris-Pratt - Found instance of TEST starting at character 109

Knuth-Morris-Pratt - Found instance of TEST starting at character 113

Knuth-Morris-Pratt - Found instance of TEST starting at character 117

Knuth-Morris-Pratt - Found instance of TEST starting at character 121

Knuth-Morris-Pratt - Found instance of TEST starting at character 125

Knuth-Morris-Pratt - Found instance of TEST starting at character 129

Knuth-Morris-Pratt - Found instance of TEST starting at character 133

Knuth-Morris-Pratt - Found instance of TEST starting at character 137

Knuth-Morris-Pratt - Found instance of TEST starting at character 141

Knuth-Morris-Pratt - Found instance of TEST starting at character 145

Knuth-Morris-Pratt - Found instance of TEST starting at character 149

2417137.000 ns/op

Iteration 4: Knuth-Morris-Pratt - Found instance of TEST starting at character 1

Knuth-Morris-Pratt - Found instance of TEST starting at character 5

Knuth-Morris-Pratt - Found instance of TEST starting at character 9

Knuth-Morris-Pratt - Found instance of TEST starting at character 13

Knuth-Morris-Pratt - Found instance of TEST starting at character 17

Knuth-Morris-Pratt - Found instance of TEST starting at character 21

Knuth-Morris-Pratt - Found instance of TEST starting at character 25

Knuth-Morris-Pratt - Found instance of TEST starting at character 29

Knuth-Morris-Pratt - Found instance of TEST starting at character 33

Knuth-Morris-Pratt - Found instance of TEST starting at character 37

Knuth-Morris-Pratt - Found instance of TEST starting at character 41

Knuth-Morris-Pratt - Found instance of TEST starting at character 45

Knuth-Morris-Pratt - Found instance of TEST starting at character 49

Knuth-Morris-Pratt - Found instance of TEST starting at character 53

Knuth-Morris-Pratt - Found instance of TEST starting at character 57

Knuth-Morris-Pratt - Found instance of TEST starting at character 61

Knuth-Morris-Pratt - Found instance of TEST starting at character 65

Knuth-Morris-Pratt - Found instance of TEST starting at character 69

Knuth-Morris-Pratt - Found instance of TEST starting at character 73

Knuth-Morris-Pratt - Found instance of TEST starting at character 77

Knuth-Morris-Pratt - Found instance of TEST starting at character 81

Knuth-Morris-Pratt - Found instance of TEST starting at character 85

Knuth-Morris-Pratt - Found instance of TEST starting at character 89

Knuth-Morris-Pratt - Found instance of TEST starting at character 93

Knuth-Morris-Pratt - Found instance of TEST starting at character 97

Knuth-Morris-Pratt - Found instance of TEST starting at character 101

Knuth-Morris-Pratt - Found instance of TEST starting at character 105

Knuth-Morris-Pratt - Found instance of TEST starting at character 109

Knuth-Morris-Pratt - Found instance of TEST starting at character 113

Knuth-Morris-Pratt - Found instance of TEST starting at character 117

Knuth-Morris-Pratt - Found instance of TEST starting at character 121

Knuth-Morris-Pratt - Found instance of TEST starting at character 125

Knuth-Morris-Pratt - Found instance of TEST starting at character 129

Knuth-Morris-Pratt - Found instance of TEST starting at character 133

Knuth-Morris-Pratt - Found instance of TEST starting at character 137

Knuth-Morris-Pratt - Found instance of TEST starting at character 141

Knuth-Morris-Pratt - Found instance of TEST starting at character 145

Knuth-Morris-Pratt - Found instance of TEST starting at character 149

2201886.000 ns/op

Iteration 5: Knuth-Morris-Pratt - Found instance of TEST starting at character 1

Knuth-Morris-Pratt - Found instance of TEST starting at character 5

Knuth-Morris-Pratt - Found instance of TEST starting at character 9

Knuth-Morris-Pratt - Found instance of TEST starting at character 13

Knuth-Morris-Pratt - Found instance of TEST starting at character 17

Knuth-Morris-Pratt - Found instance of TEST starting at character 21

Knuth-Morris-Pratt - Found instance of TEST starting at character 25

Knuth-Morris-Pratt - Found instance of TEST starting at character 29

Knuth-Morris-Pratt - Found instance of TEST starting at character 33

Knuth-Morris-Pratt - Found instance of TEST starting at character 37

Knuth-Morris-Pratt - Found instance of TEST starting at character 41

Knuth-Morris-Pratt - Found instance of TEST starting at character 45

Knuth-Morris-Pratt - Found instance of TEST starting at character 49

Knuth-Morris-Pratt - Found instance of TEST starting at character 53

Knuth-Morris-Pratt - Found instance of TEST starting at character 57

Knuth-Morris-Pratt - Found instance of TEST starting at character 61

Knuth-Morris-Pratt - Found instance of TEST starting at character 65

Knuth-Morris-Pratt - Found instance of TEST starting at character 69

Knuth-Morris-Pratt - Found instance of TEST starting at character 73

Knuth-Morris-Pratt - Found instance of TEST starting at character 77

Knuth-Morris-Pratt - Found instance of TEST starting at character 81

Knuth-Morris-Pratt - Found instance of TEST starting at character 85

Knuth-Morris-Pratt - Found instance of TEST starting at character 89

Knuth-Morris-Pratt - Found instance of TEST starting at character 93

Knuth-Morris-Pratt - Found instance of TEST starting at character 97

Knuth-Morris-Pratt - Found instance of TEST starting at character 101

Knuth-Morris-Pratt - Found instance of TEST starting at character 105

Knuth-Morris-Pratt - Found instance of TEST starting at character 109

Knuth-Morris-Pratt - Found instance of TEST starting at character 113

Knuth-Morris-Pratt - Found instance of TEST starting at character 117

Knuth-Morris-Pratt - Found instance of TEST starting at character 121

Knuth-Morris-Pratt - Found instance of TEST starting at character 125

Knuth-Morris-Pratt - Found instance of TEST starting at character 129

Knuth-Morris-Pratt - Found instance of TEST starting at character 133

Knuth-Morris-Pratt - Found instance of TEST starting at character 137

Knuth-Morris-Pratt - Found instance of TEST starting at character 141

Knuth-Morris-Pratt - Found instance of TEST starting at character 145

Knuth-Morris-Pratt - Found instance of TEST starting at character 149

1857010.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKMP":

N = 5

mean = 3211805.000 ±(99.9%) 7932277.419 ns/op

Histogram, ns/op:

[1000000.000, 1500000.000) = 0

[1500000.000, 2000000.000) = 1

[2000000.000, 2500000.000) = 2

[2500000.000, 3000000.000) = 1

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 0

[4500000.000, 5000000.000) = 0

[5000000.000, 5500000.000) = 0

[5500000.000, 6000000.000) = 0

[6000000.000, 6500000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1857010.000 ns/op

p(50.0000) = 2417137.000 ns/op

p(90.0000) = 6852617.000 ns/op

p(95.0000) = 6852617.000 ns/op

p(99.0000) = 6852617.000 ns/op

p(99.9000) = 6852617.000 ns/op

p(99.9900) = 6852617.000 ns/op

p(99.9990) = 6852617.000 ns/op

p(99.9999) = 6852617.000 ns/op

p(100.0000) = 6852617.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = )

# Run progress: 50.00% complete, ETA 00:00:04

# Fork: 1 of 1

Iteration 1: 5949430.000 ns/op

Iteration 2: 2794.000 ns/op

Iteration 3: 1816.000 ns/op

Iteration 4: 1816.000 ns/op

Iteration 5: 1886.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 1191548.400 ±(99.9%) 10241698.990 ns/op

Histogram, ns/op:

[ 0.000, 500000.000) = 4

[ 500000.000, 1000000.000) = 0

[1000000.000, 1500000.000) = 0

[1500000.000, 2000000.000) = 0

[2000000.000, 2500000.000) = 0

[2500000.000, 3000000.000) = 0

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 0

[4500000.000, 5000000.000) = 0

[5000000.000, 5500000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1816.000 ns/op

p(50.0000) = 1886.000 ns/op

p(90.0000) = 5949430.000 ns/op

p(95.0000) = 5949430.000 ns/op

p(99.0000) = 5949430.000 ns/op

p(99.9000) = 5949430.000 ns/op

p(99.9900) = 5949430.000 ns/op

p(99.9990) = 5949430.000 ns/op

p(99.9999) = 5949430.000 ns/op

p(100.0000) = 5949430.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = GCAGAGAG)

# Run progress: 52.78% complete, ETA 00:00:04

# Fork: 1 of 1

Iteration 1: 480229.000 ns/op

Iteration 2: 1885.000 ns/op

Iteration 3: 1886.000 ns/op

Iteration 4: 1397.000 ns/op

Iteration 5: 1327.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 97344.800 ±(99.9%) 824187.730 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1327.000 ns/op

p(50.0000) = 1885.000 ns/op

p(90.0000) = 480229.000 ns/op

p(95.0000) = 480229.000 ns/op

p(99.0000) = 480229.000 ns/op

p(99.9000) = 480229.000 ns/op

p(99.9900) = 480229.000 ns/op

p(99.9990) = 480229.000 ns/op

p(99.9999) = 480229.000 ns/op

p(100.0000) = 480229.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = TEST)

# Run progress: 55.56% complete, ETA 00:00:03

# Fork: 1 of 1

Iteration 1: 473105.000 ns/op

Iteration 2: 2304.000 ns/op

Iteration 3: 1886.000 ns/op

Iteration 4: 1886.000 ns/op

Iteration 5: 1886.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 96213.400 ±(99.9%) 811287.884 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1886.000 ns/op

p(50.0000) = 1886.000 ns/op

p(90.0000) = 473105.000 ns/op

p(95.0000) = 473105.000 ns/op

p(99.0000) = 473105.000 ns/op

p(99.9000) = 473105.000 ns/op

p(99.9900) = 473105.000 ns/op

p(99.9990) = 473105.000 ns/op

p(99.9999) = 473105.000 ns/op

p(100.0000) = 473105.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = )

# Run progress: 58.33% complete, ETA 00:00:03

# Fork: 1 of 1

Iteration 1: 512775.000 ns/op

Iteration 2: 2375.000 ns/op

Iteration 3: 1956.000 ns/op

Iteration 4: 1467.000 ns/op

Iteration 5: 1467.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 104008.000 ±(99.9%) 879902.999 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

[450000.000, 500000.000) = 0

[500000.000, 550000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1467.000 ns/op

p(50.0000) = 1956.000 ns/op

p(90.0000) = 512775.000 ns/op

p(95.0000) = 512775.000 ns/op

p(99.0000) = 512775.000 ns/op

p(99.9000) = 512775.000 ns/op

p(99.9900) = 512775.000 ns/op

p(99.9990) = 512775.000 ns/op

p(99.9999) = 512775.000 ns/op

p(100.0000) = 512775.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = GCAGAGAG)

# Run progress: 61.11% complete, ETA 00:00:03

# Fork: 1 of 1

Iteration 1: Karp-Rapin - Found instance of GCAGAGAG starting at character 6

Karp-Rapin - Found instance of GCAGAGAG starting at character 25

4077823.000 ns/op

Iteration 2: Karp-Rapin - Found instance of GCAGAGAG starting at character 6

Karp-Rapin - Found instance of GCAGAGAG starting at character 25

231314.000 ns/op

Iteration 3: Karp-Rapin - Found instance of GCAGAGAG starting at character 6

Karp-Rapin - Found instance of GCAGAGAG starting at character 25

249892.000 ns/op

Iteration 4: Karp-Rapin - Found instance of GCAGAGAG starting at character 6

Karp-Rapin - Found instance of GCAGAGAG starting at character 25

204425.000 ns/op

Iteration 5: Karp-Rapin - Found instance of GCAGAGAG starting at character 6

Karp-Rapin - Found instance of GCAGAGAG starting at character 25

233689.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 999428.600 ±(99.9%) 6626773.915 ns/op

Histogram, ns/op:

[ 0.000, 500000.000) = 4

[ 500000.000, 1000000.000) = 0

[1000000.000, 1500000.000) = 0

[1500000.000, 2000000.000) = 0

[2000000.000, 2500000.000) = 0

[2500000.000, 3000000.000) = 0

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 1

Percentiles, ns/op:

p(0.0000) = 204425.000 ns/op

p(50.0000) = 233689.000 ns/op

p(90.0000) = 4077823.000 ns/op

p(95.0000) = 4077823.000 ns/op

p(99.0000) = 4077823.000 ns/op

p(99.9000) = 4077823.000 ns/op

p(99.9900) = 4077823.000 ns/op

p(99.9990) = 4077823.000 ns/op

p(99.9999) = 4077823.000 ns/op

p(100.0000) = 4077823.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = TEST)

# Run progress: 63.89% complete, ETA 00:00:03

# Fork: 1 of 1

Iteration 1: 467936.000 ns/op

Iteration 2: 20324.000 ns/op

Iteration 3: 31638.000 ns/op

Iteration 4: 24095.000 ns/op

Iteration 5: 27447.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 114288.000 ±(99.9%) 761423.579 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 20324.000 ns/op

p(50.0000) = 27447.000 ns/op

p(90.0000) = 467936.000 ns/op

p(95.0000) = 467936.000 ns/op

p(99.0000) = 467936.000 ns/op

p(99.9000) = 467936.000 ns/op

p(99.9900) = 467936.000 ns/op

p(99.9990) = 467936.000 ns/op

p(99.9999) = 467936.000 ns/op

p(100.0000) = 467936.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = )

# Run progress: 66.67% complete, ETA 00:00:02

# Fork: 1 of 1

Iteration 1: 453270.000 ns/op

Iteration 2: 2794.000 ns/op

Iteration 3: 2375.000 ns/op

Iteration 4: 1955.000 ns/op

Iteration 5: 1816.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 92442.000 ±(99.9%) 776710.873 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1816.000 ns/op

p(50.0000) = 2375.000 ns/op

p(90.0000) = 453270.000 ns/op

p(95.0000) = 453270.000 ns/op

p(99.0000) = 453270.000 ns/op

p(99.9000) = 453270.000 ns/op

p(99.9900) = 453270.000 ns/op

p(99.9990) = 453270.000 ns/op

p(99.9999) = 453270.000 ns/op

p(100.0000) = 453270.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = GCAGAGAG)

# Run progress: 69.44% complete, ETA 00:00:02

# Fork: 1 of 1

Iteration 1: 567251.000 ns/op

Iteration 2: 123969.000 ns/op

Iteration 3: 125365.000 ns/op

Iteration 4: 58177.000 ns/op

Iteration 5: 83251.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 191602.600 ±(99.9%) 815972.945 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 0

[ 50000.000, 100000.000) = 2

[100000.000, 150000.000) = 2

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

[450000.000, 500000.000) = 0

[500000.000, 550000.000) = 0

Percentiles, ns/op:

p(0.0000) = 58177.000 ns/op

p(50.0000) = 123969.000 ns/op

p(90.0000) = 567251.000 ns/op

p(95.0000) = 567251.000 ns/op

p(99.0000) = 567251.000 ns/op

p(99.9000) = 567251.000 ns/op

p(99.9900) = 567251.000 ns/op

p(99.9990) = 567251.000 ns/op

p(99.9999) = 567251.000 ns/op

p(100.0000) = 567251.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureKR

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = TEST)

# Run progress: 72.22% complete, ETA 00:00:02

# Fork: 1 of 1

Iteration 1: Karp-Rapin - Found instance of TEST starting at character 1

Karp-Rapin - Found instance of TEST starting at character 5

Karp-Rapin - Found instance of TEST starting at character 9

Karp-Rapin - Found instance of TEST starting at character 13

Karp-Rapin - Found instance of TEST starting at character 17

Karp-Rapin - Found instance of TEST starting at character 21

Karp-Rapin - Found instance of TEST starting at character 25

Karp-Rapin - Found instance of TEST starting at character 29

Karp-Rapin - Found instance of TEST starting at character 33

Karp-Rapin - Found instance of TEST starting at character 37

Karp-Rapin - Found instance of TEST starting at character 41

Karp-Rapin - Found instance of TEST starting at character 45

Karp-Rapin - Found instance of TEST starting at character 49

Karp-Rapin - Found instance of TEST starting at character 53

Karp-Rapin - Found instance of TEST starting at character 57

Karp-Rapin - Found instance of TEST starting at character 61

Karp-Rapin - Found instance of TEST starting at character 65

Karp-Rapin - Found instance of TEST starting at character 69

Karp-Rapin - Found instance of TEST starting at character 73

Karp-Rapin - Found instance of TEST starting at character 77

Karp-Rapin - Found instance of TEST starting at character 81

Karp-Rapin - Found instance of TEST starting at character 85

Karp-Rapin - Found instance of TEST starting at character 89

Karp-Rapin - Found instance of TEST starting at character 93

Karp-Rapin - Found instance of TEST starting at character 97

Karp-Rapin - Found instance of TEST starting at character 101

Karp-Rapin - Found instance of TEST starting at character 105

Karp-Rapin - Found instance of TEST starting at character 109

Karp-Rapin - Found instance of TEST starting at character 113

Karp-Rapin - Found instance of TEST starting at character 117

Karp-Rapin - Found instance of TEST starting at character 121

Karp-Rapin - Found instance of TEST starting at character 125

Karp-Rapin - Found instance of TEST starting at character 129

Karp-Rapin - Found instance of TEST starting at character 133

Karp-Rapin - Found instance of TEST starting at character 137

Karp-Rapin - Found instance of TEST starting at character 141

Karp-Rapin - Found instance of TEST starting at character 145

Karp-Rapin - Found instance of TEST starting at character 149

7501233.000 ns/op

Iteration 2: Karp-Rapin - Found instance of TEST starting at character 1

Karp-Rapin - Found instance of TEST starting at character 5

Karp-Rapin - Found instance of TEST starting at character 9

Karp-Rapin - Found instance of TEST starting at character 13

Karp-Rapin - Found instance of TEST starting at character 17

Karp-Rapin - Found instance of TEST starting at character 21

Karp-Rapin - Found instance of TEST starting at character 25

Karp-Rapin - Found instance of TEST starting at character 29

Karp-Rapin - Found instance of TEST starting at character 33

Karp-Rapin - Found instance of TEST starting at character 37

Karp-Rapin - Found instance of TEST starting at character 41

Karp-Rapin - Found instance of TEST starting at character 45

Karp-Rapin - Found instance of TEST starting at character 49

Karp-Rapin - Found instance of TEST starting at character 53

Karp-Rapin - Found instance of TEST starting at character 57

Karp-Rapin - Found instance of TEST starting at character 61

Karp-Rapin - Found instance of TEST starting at character 65

Karp-Rapin - Found instance of TEST starting at character 69

Karp-Rapin - Found instance of TEST starting at character 73

Karp-Rapin - Found instance of TEST starting at character 77

Karp-Rapin - Found instance of TEST starting at character 81

Karp-Rapin - Found instance of TEST starting at character 85

Karp-Rapin - Found instance of TEST starting at character 89

Karp-Rapin - Found instance of TEST starting at character 93

Karp-Rapin - Found instance of TEST starting at character 97

Karp-Rapin - Found instance of TEST starting at character 101

Karp-Rapin - Found instance of TEST starting at character 105

Karp-Rapin - Found instance of TEST starting at character 109

Karp-Rapin - Found instance of TEST starting at character 113

Karp-Rapin - Found instance of TEST starting at character 117

Karp-Rapin - Found instance of TEST starting at character 121

Karp-Rapin - Found instance of TEST starting at character 125

Karp-Rapin - Found instance of TEST starting at character 129

Karp-Rapin - Found instance of TEST starting at character 133

Karp-Rapin - Found instance of TEST starting at character 137

Karp-Rapin - Found instance of TEST starting at character 141

Karp-Rapin - Found instance of TEST starting at character 145

Karp-Rapin - Found instance of TEST starting at character 149

2820261.000 ns/op

Iteration 3: Karp-Rapin - Found instance of TEST starting at character 1

Karp-Rapin - Found instance of TEST starting at character 5

Karp-Rapin - Found instance of TEST starting at character 9

Karp-Rapin - Found instance of TEST starting at character 13

Karp-Rapin - Found instance of TEST starting at character 17

Karp-Rapin - Found instance of TEST starting at character 21

Karp-Rapin - Found instance of TEST starting at character 25

Karp-Rapin - Found instance of TEST starting at character 29

Karp-Rapin - Found instance of TEST starting at character 33

Karp-Rapin - Found instance of TEST starting at character 37

Karp-Rapin - Found instance of TEST starting at character 41

Karp-Rapin - Found instance of TEST starting at character 45

Karp-Rapin - Found instance of TEST starting at character 49

Karp-Rapin - Found instance of TEST starting at character 53

Karp-Rapin - Found instance of TEST starting at character 57

Karp-Rapin - Found instance of TEST starting at character 61

Karp-Rapin - Found instance of TEST starting at character 65

Karp-Rapin - Found instance of TEST starting at character 69

Karp-Rapin - Found instance of TEST starting at character 73

Karp-Rapin - Found instance of TEST starting at character 77

Karp-Rapin - Found instance of TEST starting at character 81

Karp-Rapin - Found instance of TEST starting at character 85

Karp-Rapin - Found instance of TEST starting at character 89

Karp-Rapin - Found instance of TEST starting at character 93

Karp-Rapin - Found instance of TEST starting at character 97

Karp-Rapin - Found instance of TEST starting at character 101

Karp-Rapin - Found instance of TEST starting at character 105

Karp-Rapin - Found instance of TEST starting at character 109

Karp-Rapin - Found instance of TEST starting at character 113

Karp-Rapin - Found instance of TEST starting at character 117

Karp-Rapin - Found instance of TEST starting at character 121

Karp-Rapin - Found instance of TEST starting at character 125

Karp-Rapin - Found instance of TEST starting at character 129

Karp-Rapin - Found instance of TEST starting at character 133

Karp-Rapin - Found instance of TEST starting at character 137

Karp-Rapin - Found instance of TEST starting at character 141

Karp-Rapin - Found instance of TEST starting at character 145

Karp-Rapin - Found instance of TEST starting at character 149

2453105.000 ns/op

Iteration 4: Karp-Rapin - Found instance of TEST starting at character 1

Karp-Rapin - Found instance of TEST starting at character 5

Karp-Rapin - Found instance of TEST starting at character 9

Karp-Rapin - Found instance of TEST starting at character 13

Karp-Rapin - Found instance of TEST starting at character 17

Karp-Rapin - Found instance of TEST starting at character 21

Karp-Rapin - Found instance of TEST starting at character 25

Karp-Rapin - Found instance of TEST starting at character 29

Karp-Rapin - Found instance of TEST starting at character 33

Karp-Rapin - Found instance of TEST starting at character 37

Karp-Rapin - Found instance of TEST starting at character 41

Karp-Rapin - Found instance of TEST starting at character 45

Karp-Rapin - Found instance of TEST starting at character 49

Karp-Rapin - Found instance of TEST starting at character 53

Karp-Rapin - Found instance of TEST starting at character 57

Karp-Rapin - Found instance of TEST starting at character 61

Karp-Rapin - Found instance of TEST starting at character 65

Karp-Rapin - Found instance of TEST starting at character 69

Karp-Rapin - Found instance of TEST starting at character 73

Karp-Rapin - Found instance of TEST starting at character 77

Karp-Rapin - Found instance of TEST starting at character 81

Karp-Rapin - Found instance of TEST starting at character 85

Karp-Rapin - Found instance of TEST starting at character 89

Karp-Rapin - Found instance of TEST starting at character 93

Karp-Rapin - Found instance of TEST starting at character 97

Karp-Rapin - Found instance of TEST starting at character 101

Karp-Rapin - Found instance of TEST starting at character 105

Karp-Rapin - Found instance of TEST starting at character 109

Karp-Rapin - Found instance of TEST starting at character 113

Karp-Rapin - Found instance of TEST starting at character 117

Karp-Rapin - Found instance of TEST starting at character 121

Karp-Rapin - Found instance of TEST starting at character 125

Karp-Rapin - Found instance of TEST starting at character 129

Karp-Rapin - Found instance of TEST starting at character 133

Karp-Rapin - Found instance of TEST starting at character 137

Karp-Rapin - Found instance of TEST starting at character 141

Karp-Rapin - Found instance of TEST starting at character 145

Karp-Rapin - Found instance of TEST starting at character 149

2418044.000 ns/op

Iteration 5: Karp-Rapin - Found instance of TEST starting at character 1

Karp-Rapin - Found instance of TEST starting at character 5

Karp-Rapin - Found instance of TEST starting at character 9

Karp-Rapin - Found instance of TEST starting at character 13

Karp-Rapin - Found instance of TEST starting at character 17

Karp-Rapin - Found instance of TEST starting at character 21

Karp-Rapin - Found instance of TEST starting at character 25

Karp-Rapin - Found instance of TEST starting at character 29

Karp-Rapin - Found instance of TEST starting at character 33

Karp-Rapin - Found instance of TEST starting at character 37

Karp-Rapin - Found instance of TEST starting at character 41

Karp-Rapin - Found instance of TEST starting at character 45

Karp-Rapin - Found instance of TEST starting at character 49

Karp-Rapin - Found instance of TEST starting at character 53

Karp-Rapin - Found instance of TEST starting at character 57

Karp-Rapin - Found instance of TEST starting at character 61

Karp-Rapin - Found instance of TEST starting at character 65

Karp-Rapin - Found instance of TEST starting at character 69

Karp-Rapin - Found instance of TEST starting at character 73

Karp-Rapin - Found instance of TEST starting at character 77

Karp-Rapin - Found instance of TEST starting at character 81

Karp-Rapin - Found instance of TEST starting at character 85

Karp-Rapin - Found instance of TEST starting at character 89

Karp-Rapin - Found instance of TEST starting at character 93

Karp-Rapin - Found instance of TEST starting at character 97

Karp-Rapin - Found instance of TEST starting at character 101

Karp-Rapin - Found instance of TEST starting at character 105

Karp-Rapin - Found instance of TEST starting at character 109

Karp-Rapin - Found instance of TEST starting at character 113

Karp-Rapin - Found instance of TEST starting at character 117

Karp-Rapin - Found instance of TEST starting at character 121

Karp-Rapin - Found instance of TEST starting at character 125

Karp-Rapin - Found instance of TEST starting at character 129

Karp-Rapin - Found instance of TEST starting at character 133

Karp-Rapin - Found instance of TEST starting at character 137

Karp-Rapin - Found instance of TEST starting at character 141

Karp-Rapin - Found instance of TEST starting at character 145

Karp-Rapin - Found instance of TEST starting at character 149

2685397.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureKR":

N = 5

mean = 3575608.000 ±(99.9%) 8474374.942 ns/op

Histogram, ns/op:

[2000000.000, 2500000.000) = 2

[2500000.000, 3000000.000) = 2

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 0

[4500000.000, 5000000.000) = 0

[5000000.000, 5500000.000) = 0

[5500000.000, 6000000.000) = 0

[6000000.000, 6500000.000) = 0

[6500000.000, 7000000.000) = 0

[7000000.000, 7500000.000) = 0

Percentiles, ns/op:

p(0.0000) = 2418044.000 ns/op

p(50.0000) = 2685397.000 ns/op

p(90.0000) = 7501233.000 ns/op

p(95.0000) = 7501233.000 ns/op

p(99.0000) = 7501233.000 ns/op

p(99.9000) = 7501233.000 ns/op

p(99.9900) = 7501233.000 ns/op

p(99.9990) = 7501233.000 ns/op

p(99.9999) = 7501233.000 ns/op

p(100.0000) = 7501233.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = )

# Run progress: 75.00% complete, ETA 00:00:02

# Fork: 1 of 1

Iteration 1: 489727.000 ns/op

Iteration 2: 2305.000 ns/op

Iteration 3: 1816.000 ns/op

Iteration 4: 1955.000 ns/op

Iteration 5: 1816.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 99523.800 ±(99.9%) 839942.160 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1816.000 ns/op

p(50.0000) = 1955.000 ns/op

p(90.0000) = 489727.000 ns/op

p(95.0000) = 489727.000 ns/op

p(99.0000) = 489727.000 ns/op

p(99.9000) = 489727.000 ns/op

p(99.9900) = 489727.000 ns/op

p(99.9990) = 489727.000 ns/op

p(99.9999) = 489727.000 ns/op

p(100.0000) = 489727.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = GCAGAGAG)

# Run progress: 77.78% complete, ETA 00:00:01

# Fork: 1 of 1

Iteration 1: 489238.000 ns/op

Iteration 2: 1397.000 ns/op

Iteration 3: 1956.000 ns/op

Iteration 4: 1816.000 ns/op

Iteration 5: 1466.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 99174.600 ±(99.9%) 839641.360 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

Percentiles, ns/op:

p(0.0000) = 1397.000 ns/op

p(50.0000) = 1816.000 ns/op

p(90.0000) = 489238.000 ns/op

p(95.0000) = 489238.000 ns/op

p(99.0000) = 489238.000 ns/op

p(99.9000) = 489238.000 ns/op

p(99.9900) = 489238.000 ns/op

p(99.9990) = 489238.000 ns/op

p(99.9999) = 489238.000 ns/op

p(100.0000) = 489238.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = , PARTIAL\_STRING = TEST)

# Run progress: 80.56% complete, ETA 00:00:01

# Fork: 1 of 1

Iteration 1: 436229.000 ns/op

Iteration 2: 1816.000 ns/op

Iteration 3: 1885.000 ns/op

Iteration 4: 1886.000 ns/op

Iteration 5: 1885.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 88740.200 ±(99.9%) 747995.850 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1816.000 ns/op

p(50.0000) = 1885.000 ns/op

p(90.0000) = 436229.000 ns/op

p(95.0000) = 436229.000 ns/op

p(99.0000) = 436229.000 ns/op

p(99.9000) = 436229.000 ns/op

p(99.9900) = 436229.000 ns/op

p(99.9990) = 436229.000 ns/op

p(99.9999) = 436229.000 ns/op

p(100.0000) = 436229.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = )

# Run progress: 83.33% complete, ETA 00:00:01

# Fork: 1 of 1

Iteration 1: 504323.000 ns/op

Iteration 2: 2375.000 ns/op

Iteration 3: 2444.000 ns/op

Iteration 4: 1886.000 ns/op

Iteration 5: 2374.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 102680.400 ±(99.9%) 864566.406 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 0

[450000.000, 500000.000) = 0

[500000.000, 550000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1886.000 ns/op

p(50.0000) = 2375.000 ns/op

p(90.0000) = 504323.000 ns/op

p(95.0000) = 504323.000 ns/op

p(99.0000) = 504323.000 ns/op

p(99.9000) = 504323.000 ns/op

p(99.9900) = 504323.000 ns/op

p(99.9990) = 504323.000 ns/op

p(99.9999) = 504323.000 ns/op

p(100.0000) = 504323.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = GCAGAGAG)

# Run progress: 86.11% complete, ETA 00:00:01

# Fork: 1 of 1

Iteration 1: Zhu-Takaoka - Found instance of GCAGAGAG starting at character 6

Zhu-Takaoka - Found instance of GCAGAGAG starting at character 25

4302014.000 ns/op

Iteration 2: Zhu-Takaoka - Found instance of GCAGAGAG starting at character 6

Zhu-Takaoka - Found instance of GCAGAGAG starting at character 25

290469.000 ns/op

Iteration 3: Zhu-Takaoka - Found instance of GCAGAGAG starting at character 6

Zhu-Takaoka - Found instance of GCAGAGAG starting at character 25

206241.000 ns/op

Iteration 4: Zhu-Takaoka - Found instance of GCAGAGAG starting at character 6

Zhu-Takaoka - Found instance of GCAGAGAG starting at character 25

197232.000 ns/op

Iteration 5: Zhu-Takaoka - Found instance of GCAGAGAG starting at character 6

Zhu-Takaoka - Found instance of GCAGAGAG starting at character 25

184032.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 1035997.600 ±(99.9%) 7032182.836 ns/op

Histogram, ns/op:

[ 0.000, 500000.000) = 4

[ 500000.000, 1000000.000) = 0

[1000000.000, 1500000.000) = 0

[1500000.000, 2000000.000) = 0

[2000000.000, 2500000.000) = 0

[2500000.000, 3000000.000) = 0

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 1

Percentiles, ns/op:

p(0.0000) = 184032.000 ns/op

p(50.0000) = 206241.000 ns/op

p(90.0000) = 4302014.000 ns/op

p(95.0000) = 4302014.000 ns/op

p(99.0000) = 4302014.000 ns/op

p(99.9000) = 4302014.000 ns/op

p(99.9900) = 4302014.000 ns/op

p(99.9990) = 4302014.000 ns/op

p(99.9999) = 4302014.000 ns/op

p(100.0000) = 4302014.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = GCATCGCAGAGAGTATACAGTACGGCAGAGAG, PARTIAL\_STRING = TEST)

# Run progress: 88.89% complete, ETA 00:00:00

# Fork: 1 of 1

Iteration 1: 3056883.000 ns/op

Iteration 2: 34013.000 ns/op

Iteration 3: 24584.000 ns/op

Iteration 4: 18927.000 ns/op

Iteration 5: 18996.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 630680.600 ±(99.9%) 5222637.288 ns/op

Histogram, ns/op:

[ 0.000, 250000.000) = 4

[ 250000.000, 500000.000) = 0

[ 500000.000, 750000.000) = 0

[ 750000.000, 1000000.000) = 0

[1000000.000, 1250000.000) = 0

[1250000.000, 1500000.000) = 0

[1500000.000, 1750000.000) = 0

[1750000.000, 2000000.000) = 0

[2000000.000, 2250000.000) = 0

[2250000.000, 2500000.000) = 0

[2500000.000, 2750000.000) = 0

[2750000.000, 3000000.000) = 0

[3000000.000, 3250000.000) = 1

[3250000.000, 3500000.000) = 0

[3500000.000, 3750000.000) = 0

Percentiles, ns/op:

p(0.0000) = 18927.000 ns/op

p(50.0000) = 24584.000 ns/op

p(90.0000) = 3056883.000 ns/op

p(95.0000) = 3056883.000 ns/op

p(99.0000) = 3056883.000 ns/op

p(99.9000) = 3056883.000 ns/op

p(99.9900) = 3056883.000 ns/op

p(99.9990) = 3056883.000 ns/op

p(99.9999) = 3056883.000 ns/op

p(100.0000) = 3056883.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = )

# Run progress: 91.67% complete, ETA 00:00:00

# Fork: 1 of 1

Iteration 1: 418698.000 ns/op

Iteration 2: 2723.000 ns/op

Iteration 3: 2445.000 ns/op

Iteration 4: 1886.000 ns/op

Iteration 5: 2374.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 85625.200 ±(99.9%) 716965.255 ns/op

Histogram, ns/op:

[ 0.000, 50000.000) = 4

[ 50000.000, 100000.000) = 0

[100000.000, 150000.000) = 0

[150000.000, 200000.000) = 0

[200000.000, 250000.000) = 0

[250000.000, 300000.000) = 0

[300000.000, 350000.000) = 0

[350000.000, 400000.000) = 0

[400000.000, 450000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1886.000 ns/op

p(50.0000) = 2445.000 ns/op

p(90.0000) = 418698.000 ns/op

p(95.0000) = 418698.000 ns/op

p(99.0000) = 418698.000 ns/op

p(99.9000) = 418698.000 ns/op

p(99.9900) = 418698.000 ns/op

p(99.9990) = 418698.000 ns/op

p(99.9999) = 418698.000 ns/op

p(100.0000) = 418698.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = GCAGAGAG)

# Run progress: 94.44% complete, ETA 00:00:00

# Fork: 1 of 1

Iteration 1: 3042217.000 ns/op

Iteration 2: 27448.000 ns/op

Iteration 3: 29263.000 ns/op

Iteration 4: 24096.000 ns/op

Iteration 5: 38832.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 632371.200 ±(99.9%) 5187417.610 ns/op

Histogram, ns/op:

[ 0.000, 250000.000) = 4

[ 250000.000, 500000.000) = 0

[ 500000.000, 750000.000) = 0

[ 750000.000, 1000000.000) = 0

[1000000.000, 1250000.000) = 0

[1250000.000, 1500000.000) = 0

[1500000.000, 1750000.000) = 0

[1750000.000, 2000000.000) = 0

[2000000.000, 2250000.000) = 0

[2250000.000, 2500000.000) = 0

[2500000.000, 2750000.000) = 0

[2750000.000, 3000000.000) = 0

[3000000.000, 3250000.000) = 1

[3250000.000, 3500000.000) = 0

[3500000.000, 3750000.000) = 0

Percentiles, ns/op:

p(0.0000) = 24096.000 ns/op

p(50.0000) = 29263.000 ns/op

p(90.0000) = 3042217.000 ns/op

p(95.0000) = 3042217.000 ns/op

p(99.0000) = 3042217.000 ns/op

p(99.9000) = 3042217.000 ns/op

p(99.9900) = 3042217.000 ns/op

p(99.9990) = 3042217.000 ns/op

p(99.9999) = 3042217.000 ns/op

p(100.0000) = 3042217.000 ns/op

# JMH version: 1.26

# VM version: JDK 16.0.1, OpenJDK 64-Bit Server VM, 16.0.1+9-24

# VM invoker: C:\Users\cenon\.jdks\openjdk-16.0.1\bin\java.exe

# VM options: -Xms2G -Xmx2G

# Warmup: <none>

# Measurement: 5 iterations, single-shot each

# Timeout: 10 min per iteration

# Threads: 1 thread

# Benchmark mode: Single shot invocation time

# Benchmark: com.cs333.stringsearch.BenchmarkTests.measureZhu

# Parameters: (FULL\_STRING = TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST, PARTIAL\_STRING = TEST)

# Run progress: 97.22% complete, ETA 00:00:00

# Fork: 1 of 1

Iteration 1: Zhu-Takaoka - Found instance of TEST starting at character 1

Zhu-Takaoka - Found instance of TEST starting at character 5

Zhu-Takaoka - Found instance of TEST starting at character 9

Zhu-Takaoka - Found instance of TEST starting at character 13

Zhu-Takaoka - Found instance of TEST starting at character 17

Zhu-Takaoka - Found instance of TEST starting at character 21

Zhu-Takaoka - Found instance of TEST starting at character 25

Zhu-Takaoka - Found instance of TEST starting at character 29

Zhu-Takaoka - Found instance of TEST starting at character 33

Zhu-Takaoka - Found instance of TEST starting at character 37

Zhu-Takaoka - Found instance of TEST starting at character 41

Zhu-Takaoka - Found instance of TEST starting at character 45

Zhu-Takaoka - Found instance of TEST starting at character 49

Zhu-Takaoka - Found instance of TEST starting at character 53

Zhu-Takaoka - Found instance of TEST starting at character 57

Zhu-Takaoka - Found instance of TEST starting at character 61

Zhu-Takaoka - Found instance of TEST starting at character 65

Zhu-Takaoka - Found instance of TEST starting at character 69

Zhu-Takaoka - Found instance of TEST starting at character 73

Zhu-Takaoka - Found instance of TEST starting at character 77

Zhu-Takaoka - Found instance of TEST starting at character 81

Zhu-Takaoka - Found instance of TEST starting at character 85

Zhu-Takaoka - Found instance of TEST starting at character 89

Zhu-Takaoka - Found instance of TEST starting at character 93

Zhu-Takaoka - Found instance of TEST starting at character 97

Zhu-Takaoka - Found instance of TEST starting at character 101

Zhu-Takaoka - Found instance of TEST starting at character 105

Zhu-Takaoka - Found instance of TEST starting at character 109

Zhu-Takaoka - Found instance of TEST starting at character 113

Zhu-Takaoka - Found instance of TEST starting at character 117

Zhu-Takaoka - Found instance of TEST starting at character 121

Zhu-Takaoka - Found instance of TEST starting at character 125

Zhu-Takaoka - Found instance of TEST starting at character 129

Zhu-Takaoka - Found instance of TEST starting at character 133

Zhu-Takaoka - Found instance of TEST starting at character 137

Zhu-Takaoka - Found instance of TEST starting at character 141

Zhu-Takaoka - Found instance of TEST starting at character 145

Zhu-Takaoka - Found instance of TEST starting at character 149

7216001.000 ns/op

Iteration 2: Zhu-Takaoka - Found instance of TEST starting at character 1

Zhu-Takaoka - Found instance of TEST starting at character 5

Zhu-Takaoka - Found instance of TEST starting at character 9

Zhu-Takaoka - Found instance of TEST starting at character 13

Zhu-Takaoka - Found instance of TEST starting at character 17

Zhu-Takaoka - Found instance of TEST starting at character 21

Zhu-Takaoka - Found instance of TEST starting at character 25

Zhu-Takaoka - Found instance of TEST starting at character 29

Zhu-Takaoka - Found instance of TEST starting at character 33

Zhu-Takaoka - Found instance of TEST starting at character 37

Zhu-Takaoka - Found instance of TEST starting at character 41

Zhu-Takaoka - Found instance of TEST starting at character 45

Zhu-Takaoka - Found instance of TEST starting at character 49

Zhu-Takaoka - Found instance of TEST starting at character 53

Zhu-Takaoka - Found instance of TEST starting at character 57

Zhu-Takaoka - Found instance of TEST starting at character 61

Zhu-Takaoka - Found instance of TEST starting at character 65

Zhu-Takaoka - Found instance of TEST starting at character 69

Zhu-Takaoka - Found instance of TEST starting at character 73

Zhu-Takaoka - Found instance of TEST starting at character 77

Zhu-Takaoka - Found instance of TEST starting at character 81

Zhu-Takaoka - Found instance of TEST starting at character 85

Zhu-Takaoka - Found instance of TEST starting at character 89

Zhu-Takaoka - Found instance of TEST starting at character 93

Zhu-Takaoka - Found instance of TEST starting at character 97

Zhu-Takaoka - Found instance of TEST starting at character 101

Zhu-Takaoka - Found instance of TEST starting at character 105

Zhu-Takaoka - Found instance of TEST starting at character 109

Zhu-Takaoka - Found instance of TEST starting at character 113

Zhu-Takaoka - Found instance of TEST starting at character 117

Zhu-Takaoka - Found instance of TEST starting at character 121

Zhu-Takaoka - Found instance of TEST starting at character 125

Zhu-Takaoka - Found instance of TEST starting at character 129

Zhu-Takaoka - Found instance of TEST starting at character 133

Zhu-Takaoka - Found instance of TEST starting at character 137

Zhu-Takaoka - Found instance of TEST starting at character 141

Zhu-Takaoka - Found instance of TEST starting at character 145

Zhu-Takaoka - Found instance of TEST starting at character 149

2639022.000 ns/op

Iteration 3: Zhu-Takaoka - Found instance of TEST starting at character 1

Zhu-Takaoka - Found instance of TEST starting at character 5

Zhu-Takaoka - Found instance of TEST starting at character 9

Zhu-Takaoka - Found instance of TEST starting at character 13

Zhu-Takaoka - Found instance of TEST starting at character 17

Zhu-Takaoka - Found instance of TEST starting at character 21

Zhu-Takaoka - Found instance of TEST starting at character 25

Zhu-Takaoka - Found instance of TEST starting at character 29

Zhu-Takaoka - Found instance of TEST starting at character 33

Zhu-Takaoka - Found instance of TEST starting at character 37

Zhu-Takaoka - Found instance of TEST starting at character 41

Zhu-Takaoka - Found instance of TEST starting at character 45

Zhu-Takaoka - Found instance of TEST starting at character 49

Zhu-Takaoka - Found instance of TEST starting at character 53

Zhu-Takaoka - Found instance of TEST starting at character 57

Zhu-Takaoka - Found instance of TEST starting at character 61

Zhu-Takaoka - Found instance of TEST starting at character 65

Zhu-Takaoka - Found instance of TEST starting at character 69

Zhu-Takaoka - Found instance of TEST starting at character 73

Zhu-Takaoka - Found instance of TEST starting at character 77

Zhu-Takaoka - Found instance of TEST starting at character 81

Zhu-Takaoka - Found instance of TEST starting at character 85

Zhu-Takaoka - Found instance of TEST starting at character 89

Zhu-Takaoka - Found instance of TEST starting at character 93

Zhu-Takaoka - Found instance of TEST starting at character 97

Zhu-Takaoka - Found instance of TEST starting at character 101

Zhu-Takaoka - Found instance of TEST starting at character 105

Zhu-Takaoka - Found instance of TEST starting at character 109

Zhu-Takaoka - Found instance of TEST starting at character 113

Zhu-Takaoka - Found instance of TEST starting at character 117

Zhu-Takaoka - Found instance of TEST starting at character 121

Zhu-Takaoka - Found instance of TEST starting at character 125

Zhu-Takaoka - Found instance of TEST starting at character 129

Zhu-Takaoka - Found instance of TEST starting at character 133

Zhu-Takaoka - Found instance of TEST starting at character 137

Zhu-Takaoka - Found instance of TEST starting at character 141

Zhu-Takaoka - Found instance of TEST starting at character 145

Zhu-Takaoka - Found instance of TEST starting at character 149

2280457.000 ns/op

Iteration 4: Zhu-Takaoka - Found instance of TEST starting at character 1

Zhu-Takaoka - Found instance of TEST starting at character 5

Zhu-Takaoka - Found instance of TEST starting at character 9

Zhu-Takaoka - Found instance of TEST starting at character 13

Zhu-Takaoka - Found instance of TEST starting at character 17

Zhu-Takaoka - Found instance of TEST starting at character 21

Zhu-Takaoka - Found instance of TEST starting at character 25

Zhu-Takaoka - Found instance of TEST starting at character 29

Zhu-Takaoka - Found instance of TEST starting at character 33

Zhu-Takaoka - Found instance of TEST starting at character 37

Zhu-Takaoka - Found instance of TEST starting at character 41

Zhu-Takaoka - Found instance of TEST starting at character 45

Zhu-Takaoka - Found instance of TEST starting at character 49

Zhu-Takaoka - Found instance of TEST starting at character 53

Zhu-Takaoka - Found instance of TEST starting at character 57

Zhu-Takaoka - Found instance of TEST starting at character 61

Zhu-Takaoka - Found instance of TEST starting at character 65

Zhu-Takaoka - Found instance of TEST starting at character 69

Zhu-Takaoka - Found instance of TEST starting at character 73

Zhu-Takaoka - Found instance of TEST starting at character 77

Zhu-Takaoka - Found instance of TEST starting at character 81

Zhu-Takaoka - Found instance of TEST starting at character 85

Zhu-Takaoka - Found instance of TEST starting at character 89

Zhu-Takaoka - Found instance of TEST starting at character 93

Zhu-Takaoka - Found instance of TEST starting at character 97

Zhu-Takaoka - Found instance of TEST starting at character 101

Zhu-Takaoka - Found instance of TEST starting at character 105

Zhu-Takaoka - Found instance of TEST starting at character 109

Zhu-Takaoka - Found instance of TEST starting at character 113

Zhu-Takaoka - Found instance of TEST starting at character 117

Zhu-Takaoka - Found instance of TEST starting at character 121

Zhu-Takaoka - Found instance of TEST starting at character 125

Zhu-Takaoka - Found instance of TEST starting at character 129

Zhu-Takaoka - Found instance of TEST starting at character 133

Zhu-Takaoka - Found instance of TEST starting at character 137

Zhu-Takaoka - Found instance of TEST starting at character 141

Zhu-Takaoka - Found instance of TEST starting at character 145

Zhu-Takaoka - Found instance of TEST starting at character 149

2149435.000 ns/op

Iteration 5: Zhu-Takaoka - Found instance of TEST starting at character 1

Zhu-Takaoka - Found instance of TEST starting at character 5

Zhu-Takaoka - Found instance of TEST starting at character 9

Zhu-Takaoka - Found instance of TEST starting at character 13

Zhu-Takaoka - Found instance of TEST starting at character 17

Zhu-Takaoka - Found instance of TEST starting at character 21

Zhu-Takaoka - Found instance of TEST starting at character 25

Zhu-Takaoka - Found instance of TEST starting at character 29

Zhu-Takaoka - Found instance of TEST starting at character 33

Zhu-Takaoka - Found instance of TEST starting at character 37

Zhu-Takaoka - Found instance of TEST starting at character 41

Zhu-Takaoka - Found instance of TEST starting at character 45

Zhu-Takaoka - Found instance of TEST starting at character 49

Zhu-Takaoka - Found instance of TEST starting at character 53

Zhu-Takaoka - Found instance of TEST starting at character 57

Zhu-Takaoka - Found instance of TEST starting at character 61

Zhu-Takaoka - Found instance of TEST starting at character 65

Zhu-Takaoka - Found instance of TEST starting at character 69

Zhu-Takaoka - Found instance of TEST starting at character 73

Zhu-Takaoka - Found instance of TEST starting at character 77

Zhu-Takaoka - Found instance of TEST starting at character 81

Zhu-Takaoka - Found instance of TEST starting at character 85

Zhu-Takaoka - Found instance of TEST starting at character 89

Zhu-Takaoka - Found instance of TEST starting at character 93

Zhu-Takaoka - Found instance of TEST starting at character 97

Zhu-Takaoka - Found instance of TEST starting at character 101

Zhu-Takaoka - Found instance of TEST starting at character 105

Zhu-Takaoka - Found instance of TEST starting at character 109

Zhu-Takaoka - Found instance of TEST starting at character 113

Zhu-Takaoka - Found instance of TEST starting at character 117

Zhu-Takaoka - Found instance of TEST starting at character 121

Zhu-Takaoka - Found instance of TEST starting at character 125

Zhu-Takaoka - Found instance of TEST starting at character 129

Zhu-Takaoka - Found instance of TEST starting at character 133

Zhu-Takaoka - Found instance of TEST starting at character 137

Zhu-Takaoka - Found instance of TEST starting at character 141

Zhu-Takaoka - Found instance of TEST starting at character 145

Zhu-Takaoka - Found instance of TEST starting at character 149

1842832.000 ns/op

Result "com.cs333.stringsearch.BenchmarkTests.measureZhu":

N = 5

mean = 3225549.400 ±(99.9%) 8659850.703 ns/op

Histogram, ns/op:

[1000000.000, 1500000.000) = 0

[1500000.000, 2000000.000) = 1

[2000000.000, 2500000.000) = 2

[2500000.000, 3000000.000) = 1

[3000000.000, 3500000.000) = 0

[3500000.000, 4000000.000) = 0

[4000000.000, 4500000.000) = 0

[4500000.000, 5000000.000) = 0

[5000000.000, 5500000.000) = 0

[5500000.000, 6000000.000) = 0

[6000000.000, 6500000.000) = 0

[6500000.000, 7000000.000) = 0

[7000000.000, 7500000.000) = 1

Percentiles, ns/op:

p(0.0000) = 1842832.000 ns/op

p(50.0000) = 2280457.000 ns/op

p(90.0000) = 7216001.000 ns/op

p(95.0000) = 7216001.000 ns/op

p(99.0000) = 7216001.000 ns/op

p(99.9000) = 7216001.000 ns/op

p(99.9900) = 7216001.000 ns/op

p(99.9990) = 7216001.000 ns/op

p(99.9999) = 7216001.000 ns/op

p(100.0000) = 7216001.000 ns/op

# Run complete. Total time: 00:00:08

REMEMBER: The numbers below are just data. To gain reusable insights, you need to follow up on

why the numbers are the way they are. Use profilers (see -prof, -lprof), design factorial

experiments, perform baseline and negative tests that provide experimental control, make sure

the benchmarking environment is safe on JVM/OS/HW level, ask for reviews from the domain experts.

Do not assume the numbers tell you what you want them to tell.

Benchmark (FULL\_STRING) (PARTIAL\_STRING) Mode Cnt Score Error Units

BenchmarkTests.measureBM ss 5 922519.600 ± 6831211.957 ns/op

BenchmarkTests.measureBM GCAGAGAG ss 5 101814.400 ± 847189.670 ns/op

BenchmarkTests.measureBM TEST ss 5 98601.800 ± 820432.173 ns/op

BenchmarkTests.measureBM GCATCGCAGAGAGTATACAGTACGGCAGAGAG ss 5 3091901.000 ± 7066038.413 ns/op

BenchmarkTests.measureBM GCATCGCAGAGAGTATACAGTACGGCAGAGAG GCAGAGAG ss 5 983784.200 ± 6672938.664 ns/op

BenchmarkTests.measureBM GCATCGCAGAGAGTATACAGTACGGCAGAGAG TEST ss 5 103448.800 ± 793986.824 ns/op

BenchmarkTests.measureBM TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST ss 5 7911969.400 ± 16726404.448 ns/op

BenchmarkTests.measureBM TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST GCAGAGAG ss 5 94998.200 ± 733480.375 ns/op

BenchmarkTests.measureBM TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST TEST ss 5 2315475.800 ± 7303933.968 ns/op

BenchmarkTests.measureKMP ss 5 87441.600 ± 735457.531 ns/op

BenchmarkTests.measureKMP GCAGAGAG ss 5 86882.400 ± 732449.930 ns/op

BenchmarkTests.measureKMP TEST ss 5 85178.600 ± 718077.909 ns/op

BenchmarkTests.measureKMP GCATCGCAGAGAGTATACAGTACGGCAGAGAG ss 5 87609.000 ± 736150.079 ns/op

BenchmarkTests.measureKMP GCATCGCAGAGAGTATACAGTACGGCAGAGAG GCAGAGAG ss 5 923134.200 ± 6145123.699 ns/op

BenchmarkTests.measureKMP GCATCGCAGAGAGTATACAGTACGGCAGAGAG TEST ss 5 92846.600 ± 729106.006 ns/op

BenchmarkTests.measureKMP TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST ss 5 96324.800 ± 811950.097 ns/op

BenchmarkTests.measureKMP TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST GCAGAGAG ss 5 102764.200 ± 707883.531 ns/op

BenchmarkTests.measureKMP TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST TEST ss 5 3211805.000 ± 7932277.419 ns/op

BenchmarkTests.measureKR ss 5 1191548.400 ± 10241698.990 ns/op

BenchmarkTests.measureKR GCAGAGAG ss 5 97344.800 ± 824187.730 ns/op

BenchmarkTests.measureKR TEST ss 5 96213.400 ± 811287.884 ns/op

BenchmarkTests.measureKR GCATCGCAGAGAGTATACAGTACGGCAGAGAG ss 5 104008.000 ± 879902.999 ns/op

BenchmarkTests.measureKR GCATCGCAGAGAGTATACAGTACGGCAGAGAG GCAGAGAG ss 5 999428.600 ± 6626773.915 ns/op

BenchmarkTests.measureKR GCATCGCAGAGAGTATACAGTACGGCAGAGAG TEST ss 5 114288.000 ± 761423.579 ns/op

BenchmarkTests.measureKR TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST ss 5 92442.000 ± 776710.873 ns/op

BenchmarkTests.measureKR TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST GCAGAGAG ss 5 191602.600 ± 815972.945 ns/op

BenchmarkTests.measureKR TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST TEST ss 5 3575608.000 ± 8474374.942 ns/op

BenchmarkTests.measureZhu ss 5 99523.800 ± 839942.160 ns/op

BenchmarkTests.measureZhu GCAGAGAG ss 5 99174.600 ± 839641.360 ns/op

BenchmarkTests.measureZhu TEST ss 5 88740.200 ± 747995.850 ns/op

BenchmarkTests.measureZhu GCATCGCAGAGAGTATACAGTACGGCAGAGAG ss 5 102680.400 ± 864566.406 ns/op

BenchmarkTests.measureZhu GCATCGCAGAGAGTATACAGTACGGCAGAGAG GCAGAGAG ss 5 1035997.600 ± 7032182.836 ns/op

BenchmarkTests.measureZhu GCATCGCAGAGAGTATACAGTACGGCAGAGAG TEST ss 5 630680.600 ± 5222637.288 ns/op

BenchmarkTests.measureZhu TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST ss 5 85625.200 ± 716965.255 ns/op

BenchmarkTests.measureZhu TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST GCAGAGAG ss 5 632371.200 ± 5187417.610 ns/op

BenchmarkTests.measureZhu TESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTESTTEST TEST ss 5 3225549.400 ± 8659850.703 ns/op

Process finished with exit code 0