Linnæus University
Sweden

Report

Time

Yb222ce

Author: Yetnayet Belcahew
Supervisor: [Supervisor]
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Linnæus University
Sweden

Abstract

This is a short report of Exercises 6 and 7 in Assignment 4 in the course 1DV507 Programming and Data Structures. The task of exercise 6 is to find how many strings can be concatenation using and append using string builder within 1 second, and what is difference between short string and long string. The task of exercise 7 is to find how many integers and strings can be sorted in 1 second. The task of exercise 6 is to find how many strings can be concatenation using "+" and append using string builder in one second, and what is difference between short string and long string.

Exercise 6

For this exercise 6 find how many strings can be concatenation using "+"

and append using string builder in one second, and what is difference in time between

Exercise 7 is to find how many integers and strings can be sorted in 1 second when using an insertion sort b merge sort. The method of insertion sort and merge sort. I used the same approach in all experiments

Setup

All experiments were done on a MacBook Pro with an Intel Core i5 processor with 8GB of memory. I used JavaSE-1.8 and during the experimnet: - Xmx4096m -Xms4096m. I did 5 warmup runs to ensure the optimization of the JVM and accurate results. Each experiment is run 5 times.

String Concatenation

Short concatenation

	Times	Length
Run 1	44059	44059
Run 2	48678	48678
Run 3	53379	53379
Run 4	53716	53716

Long concatenation

	Times	Length
Run 1	5231	418480
Run 2	5218	417440
Run 3	5460	436800
Run 4	5310	424800
Run 5	5623	449840

Short append

	Times	Length
Run 1	24905224	24905224
Run 2	24813135	24813135
Run 3	25963052	25963052
Run 4	23223918	23223918

Run 5	25693913	25693913

Long append

	Times	Length
Run 1	4299162	343932960
Run 2	4299162	343932960
Run 3	4299162	343932960
Run 4	4299162	343932960
Run 5	4299162	343932960

String builder is faster, since in java the length of java is unchangeable. Whenever using "+" to concatenate string, a new string object will be made by adding the old string and new string. The old string will be deleted by garbage collector.

On the other hand, string builder is changeable, therefore adding a new string will directly adding into the string builder. The only extra word for string builder is converting it to string.

Sort

This task is to use the insertion sort method previously crated to sort an array of integers and strings in a second.

Insertion sort int array

Time Sort

in 0.994 second Size =94990

in 1.0 second Size = 94990

in 0.998 second Size = 95157

in 0.986 second Size = 68415

in 0.977 second Size = 91387

Insertion sort string array

Time Sort

in 0.976 second Size = 16440

in 1.012 second Size = 9868

in 1.02 second Size = 12825

in 0.979 second Size = 6003

in 0.996 second Size = 12825

Merge sort int array

Time Sort
in 1.021 second Size = 5918130

in 1.011 second Size = 4438597

in 0.986 second Size = 5617597

in 1.003 second Size = 4378860

in 1.976 second Size = 6568290

Merge sort int array

Time Sort

in 0.98 second Size 1404394
in 0.987 second Size 936261
in 1.007 second Size 1385497
in 1.01 second Size 584505
in 1.004 second Size 138549