

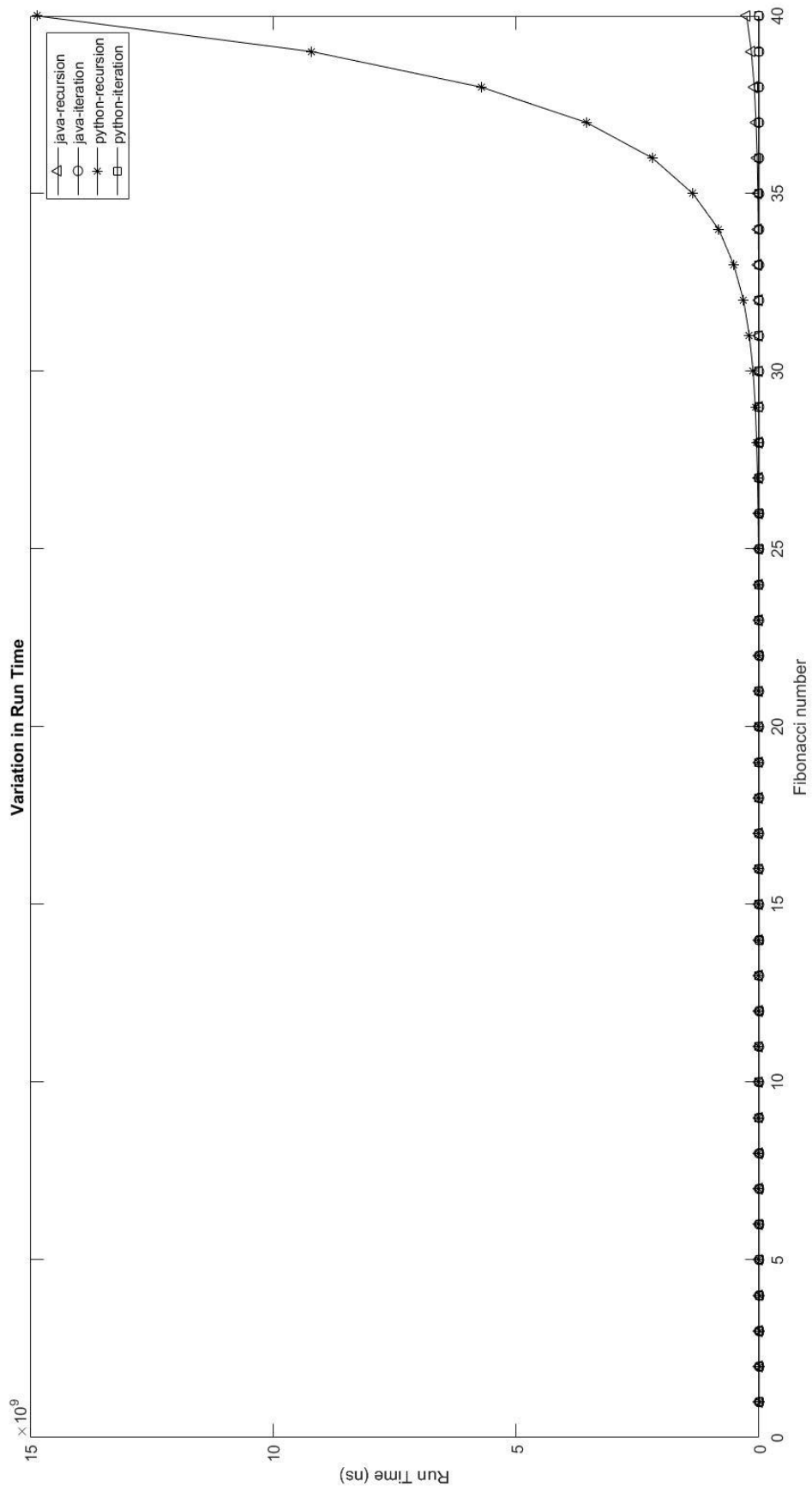
CO322 – LAB 01

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This graph represent the variation of program run time according to Fibonacci number. There are four plots. Two of them are representing java and other two are representing python. In each languages one of them are implement using recursion method and other use iteration method.

According to this graph we can see when the Fibonacci number is small (< 25) there is no any run time differences between plots. So we can say there is no difference in the run-time between the two implementations (recursion, iteration) and also between two languages when the problem is small.

But with the increase of Fibonacci number we can see differences in run time. There are slightly changes in run time between two languages when using iteration method. But when using recursion method there is a considerable variation in run time between two languages and variation is going to be high with the increase of Fibonacci number.

When calculating Fibonacci number 4, run time for program using java recursion method is 444 nanoseconds , using java iteration method run time is 520 nanoseconds , using python recursion method run time is 1907 nanoseconds and using python iteration method run time is 1907 nanoseconds. Here we can see these times are approximately equal. We can see this relation when the Fibonacci number is small. So using these observations we can conclude that if the problem is small both algorithms are useful.

Let's consider run times for Fibonacci number 40, using java recursion method run time is 254.78 milliseconds , using java iteration method run time is 1147 nanoseconds , using python recursion method run time is 14.5 seconds and using python iteration method run time is 5006.79 nanoseconds. Here we can see when using recursion method run times are very large compared to when using iteration method. We can see when using recursion method run times are going to be large with large Fibonacci numbers. So using these observations we can conclude that if the problem is large recursion method is not useful.