Quantitative exercise

We used google sheets as our data analysis tool. Four scripts were used to calculate different maximum pause times of three different languages, Nim, Java and Go. Two of the scripts use Nim, one with warm-up and the other without. What we mean by Nim warming up is that the message queue it uses to calculate maximum waiting time of the garbage collection is already full when the measurements start. The preprocessing is done by taking the output from those scripts and setting them up in tables in our tool of choice.

Our dependant variable is the maximum pause time since it is the outcome and output of what is being studied. Our independent variable is the programming language since our goal is to measure maximum pause time of garbage collection between them. In addition to that we have the computer's hardware since different computers will run the code at different speeds. We expect the maximum garbage collection time to be larger between slower computers, however that should be irrelevant since it should affect every programming language the same.

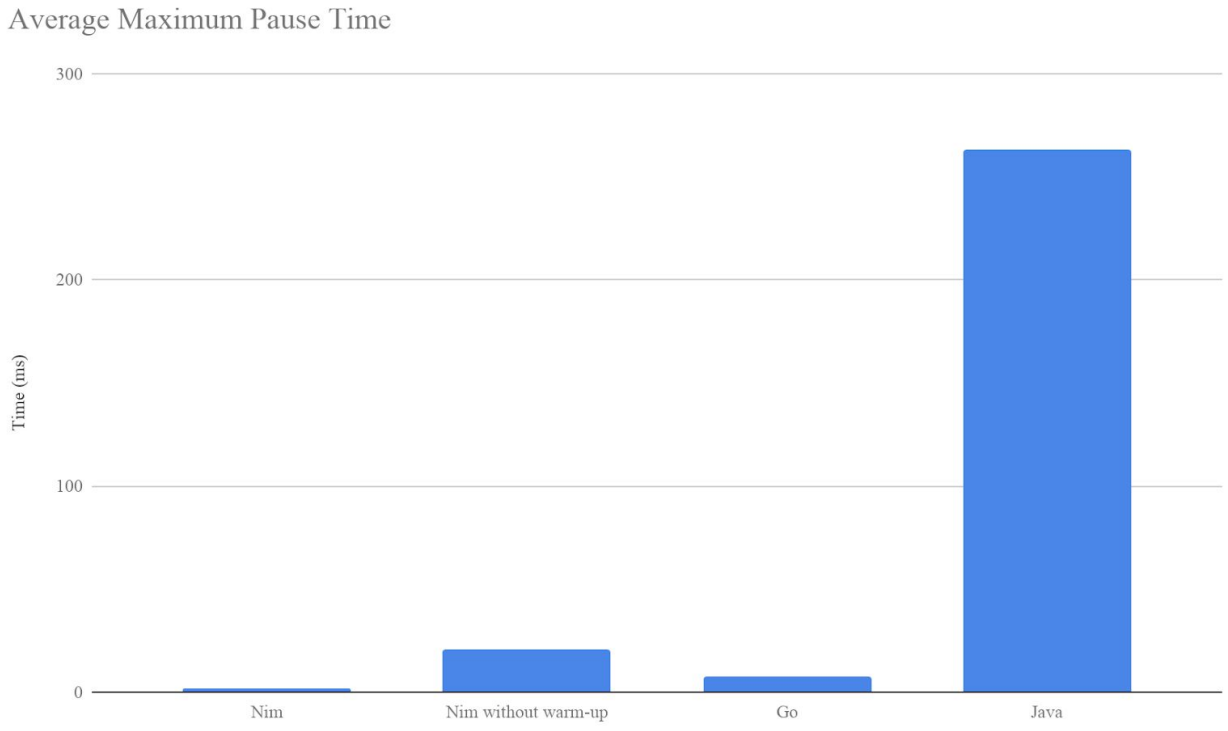
We set our data up in histograms to perform exploratory data analysis. As we can see from the graph below the data we gathered is very similar to what was posted on Nim´s website. However it is interesting to see that if Nim doesn´t get to warm-up it performs significantly worse than is advertised! This shows that the graph on Nim´s website doesn't tell the whole tale.

A model for the data is not relevant to our study. In this research we aim to analyze the performance of garbage collection in Nim. The data is sufficiently analyzed by comparing the results obtained with other programming languages.

Below we have table 1 showing the maximum waiting time for Nim, Go and Java. It is interesting to note that Nim does considerably worse when it is not allowed to warm-up first.

	Nim (ms)	Nim without warm-up (ms)	Go (ms)	Java (ms)
First run	0.817	19.264	8.741	261
Second run	2.291	23.238	7.105	264
Third run	1.16	18.396	6.074	265
Average	**1.422666667**	**20.29933333**	**7.306666667**	**263.3333333**

Table 1: Maximum waiting time for garbage collection


Average Maximum Pause Time
300
200
100
0
Time (ms)
Nim
Nim without warm-up
Go
Java