Cmpsc 473 Programming Assignment 3- Report

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4.1 Workloads- refer to the .txt files on github

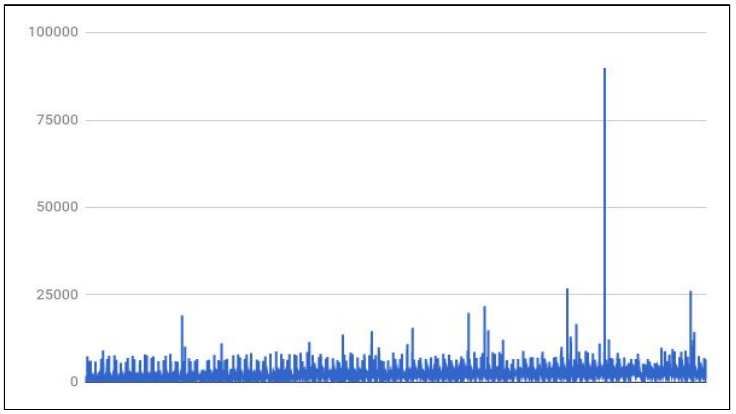
4.2 Measurements

Measure Malloc

For all the graphs: **(x - axis represents processes and y-axis represents the time)**

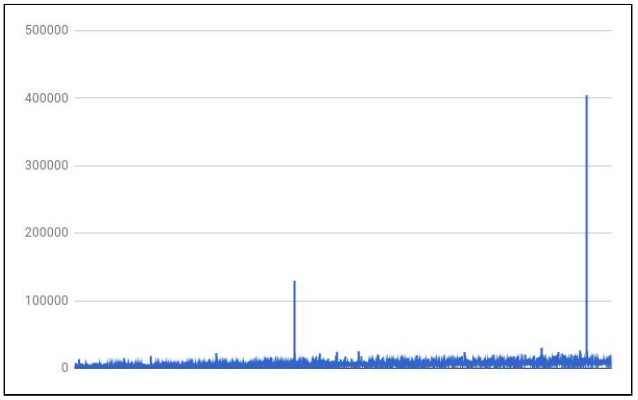
Small - Best

Average = 1991.7526 nanoseconds
Median = 1746 nanoseconds
25th percentile = 1257 nanoseconds
75th percentile = 2444 nanoseconds



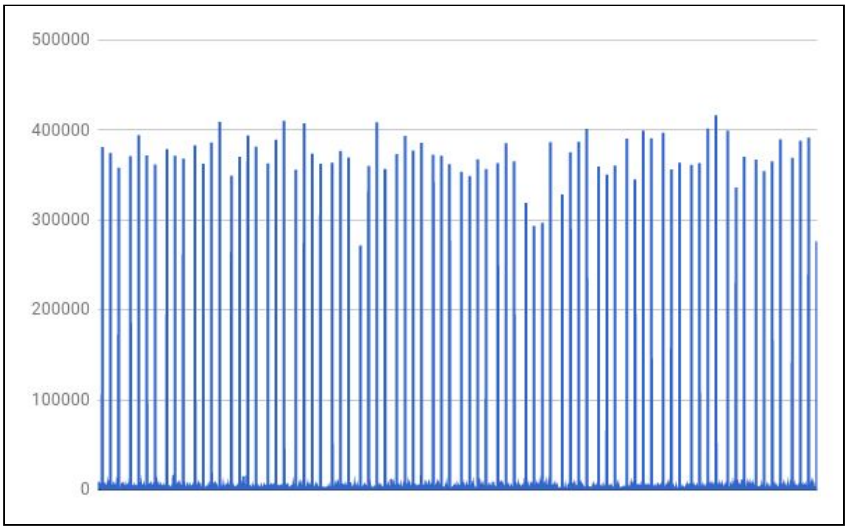
Small - Worst

Average = 5108.3269 nanoseconds
Median = 4819 nanoseconds
25th percentile = 2864 nanoseconds
75th percentile = 6845 nanoseconds



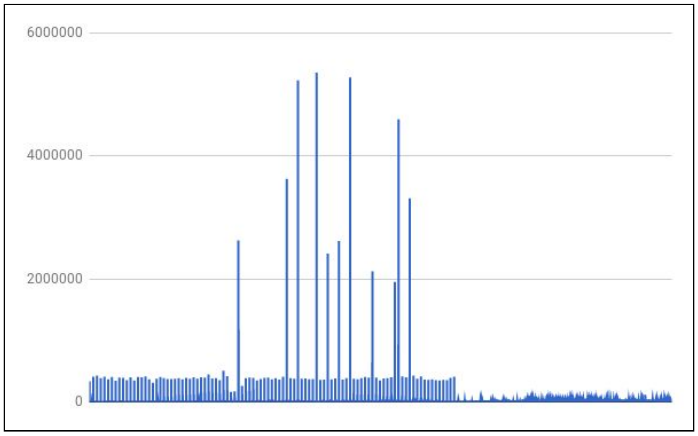
Mixed - Best

Average = 3838.8869 nanoseconds
Median = 908 nanoseconds
25th percentile = 768 nanoseconds
75th percentile = 978 nanoseconds



Mixed - Worst

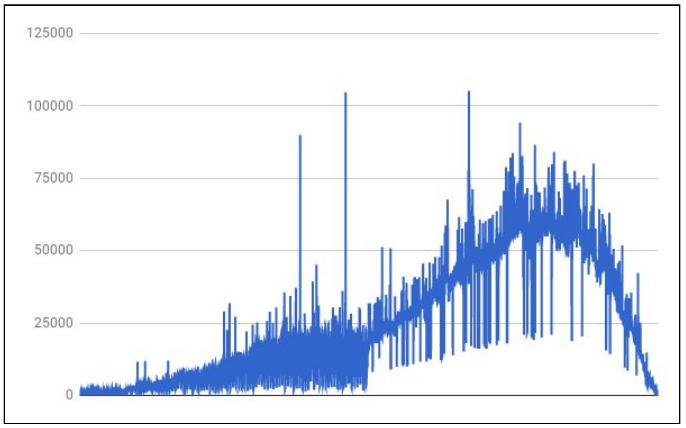
Average = 13778.9167 nanoseconds
Median = 4400 nanoseconds
25th percentile = 2444 nanoseconds
75th percentile = 8939 nanoseconds



Measure Free

Small - Best

Average = 24153.8451 nanoseconds
Median = 18997 nanoseconds
25th percentile = 4959 nanoseconds
75th percentile = 42463 nanoseconds

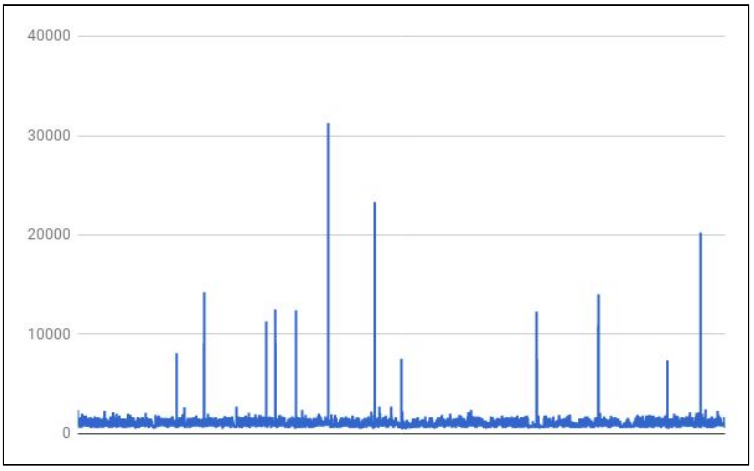


Small - Worst

Average = -41293.5702 (int overflow) nanoseconds
Median = 39111 nanoseconds
25th percentile = 10965 nanoseconds
75th percentile = 99942.5 nanoseconds

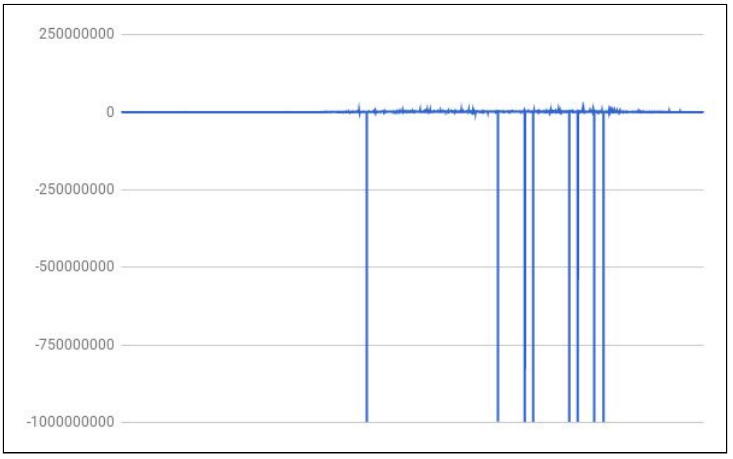
Mixed - Best

Average = 1044.3812 nanoseconds
Median = 1047 nanoseconds
25th percentile = 768 nanoseconds
75th percentile = 1188 nanoseconds



Mixed - Worst

Average = -144780.016 nanoseconds
Median = 342325.5 nanoseconds
25th percentile = 39442.5 nanoseconds
75th percentile = 1132053.5 nanoseconds



Table

(Times in nanoseconds)	**Average**	**Median**	**25th percentile**	**75th percentile**
Malloc(small-best)	1991.7526	1746	1257	2444
Malloc(small-worst)	5108.3269	4819	2864	6845
Malloc(mixed-best)	3838.8869	908	768	978
Malloc (mixed-worst)	13778.9167	4400	2444	8939
Free(small-best)	24153.8451	18997	4959	42463
Free(small-worst)	-41293.5702	39111	10965	99942.5
Free(mixed-best)	1044.3812	1047	768	1188
Free(mixed-worst)	-144780.016	342325.5	39442.5	1132053.5

The malloc_fail.txt is currently an empty file (not shown on Github currently as it is an empty file) But if reset.sh is run, there will be a new malloc_fail.txt file will be generated (as referenced in the README)

-> Number of occasions when a psumalloc() could not be satisfied due to lack of memory- there will be a malloc_fail.txt and it will display “lack of memory has occurred”.

-> Number of occasions when a psumalloc() could not be satisfied due to internal fragmentation - there will be a malloc_fail.txt and it will display “ internal fragmentation has occurred” and it occurs inside the allocated memory for the process.

5.1

In this project we use a linked list to store data. A linked list is like an array that's bound together by memory addresses. With link lists we can allocate and deallocate memory when the program is running.

The possible data structures one could use are:
Array (Did not use)
Tree -
Linked List -
As you don’t how many items will be in the list and with an array you would have to redeclare and copy every time which we thought would be inconvenient and here we would like to insert items middle of the list.