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CSCD 340

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HW4 Analysis

In order to prepare for this write-up, I did 4 tests with varying entries for adding processes. The following report will detail the pattern of data entry and the performance of the algorithms First Fit, Best Fit, and Worst Fit as they pertain to fragmentation, average fragment size, and average placement time of processes.

The first run was composed of a series of larger numbers followed by a few smaller numbers. In this run, First Fit and Best Fit both only had one fragment, while Worst Fit had three. Worst Fit is clearly the underperformer for fragmentation. First Fit and Best Fit also tied for average fragment size at 18, while Worst Fit's average fragment size was 6. Again, Worst Fit comes out on bottom. Finally, First Fit had the best average placement time at just under 10 time units while both Best Fit and Worst Fit were around 20 time units; First Fit clearly wins here.

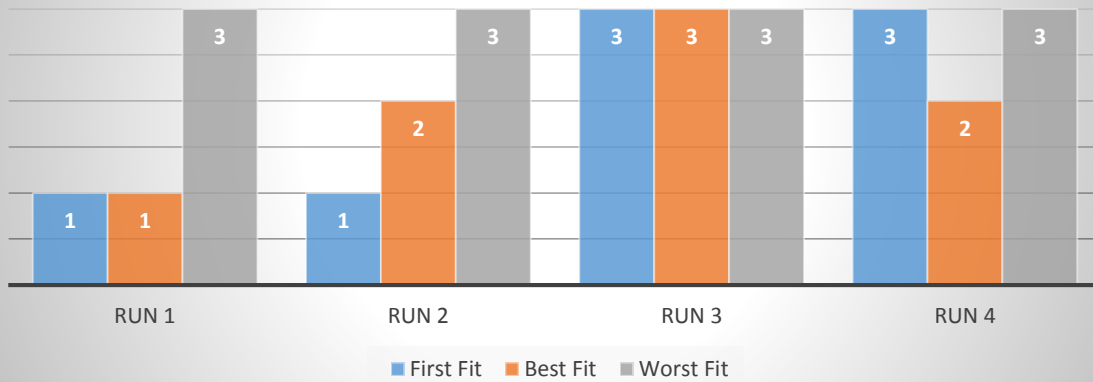
The second run added processes incrementally with a segment size equal to their process id (e.g. Process 7 had a segment size of 7). In this test First Fit had one remaining fragment, Best Fit had two, and Worst Fit had 3. Again, Worst Fit comes out last for fragmentation. For average fragment size, First Fit and Worst Fit both had a size of 12, while Best Fit had a size of 6. In this case, Best Fit underperformed. For average placement time, First Fit again blows the others away with around 13 time units to their roughly 30 time units.

The third run added processes that were all 7 in size. In this case, all three algorithms had 3 fragments remaining. The average Fragment size was 35 for each. The only variance was in the average placement time, where First Fit sat around 18 time units while the other two sat around 38 time units.

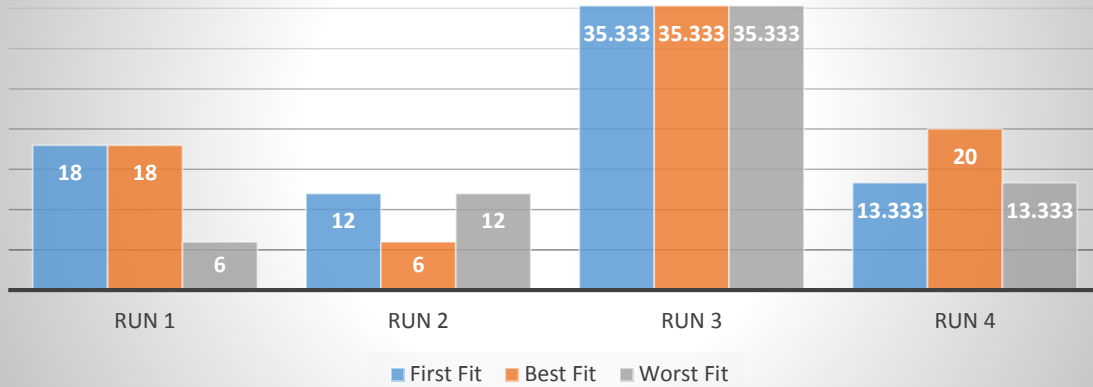
The fourth run added processes with numbers mostly sitting between 4 and 20 with a few in the upper 20's and 30's. In this case Best fit had only 2 fragments while First Fit and Worst Fit had 3. Best Fit also had the best Fragment size at 20 while the others were both at around 13. Finally, First Fit again had the best average placement time at around 12 time units while Best Fit and Worst Fit were around 25 time units. This scenario probably best resembles a real world scenario as the numbers do not follow any pattern.

In summary: First Fit and Best Fit both have few fragments, but with more and lengthier runs Best Fit would most likely come out on top here. For fragment size, again both First and Best Fit are competitive, but Best Fit is slightly better. Finally, for average placement time, First Fit is the clear winner by a factor of 2x – 3x. In conclusion, both First Fit and Best Fit are good algorithms, with First Fit being preferred for speed and Best Fit being preferred for space.

Fragments



Average Fragment Size



Average Placement Time

