Lab 08 Process Heap

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# Problem

In this lab, we must make a simulator for a process heap. We are given a driver that has the processes to send in. We must make an object for process that has the time, name, and priority. We must also make a heap to store the processes, add, processes, remove them, and then run the simulation.

# Solution

I started off by looking over the driver and the format and classes it wants. I started by creating a class to create the object process that uses comparable. The instance variables are the priority, time, and name. I have a default constructor as well as a parameterized one. Then with my setters and getters, I check for correct values. I also have a too string function to display process as well as a compare to function to use to sort the heap. Then in my process heap class, I make a heap with a given size using an array. I have an add function that takes in a process and adds it using bubble up. Bubble up runs through the heap to see where the value should go and then adds it to that spot and moves the other data. Similarly, I have a remove function that will use bubble down to move up data that can be replacing the data element that was removed from the heap. I have a print heap function that uses a for loop to send all of the heaps to strings. I finally have a check to see if the heap is empty.

# Implementation Problems Encountered

No problems were encountered in this lab.

# Lab Report Questions

1. Heaps are similar to binary search trees, however with heaps, the higher values are always higher up on the tree for a max heap or lower down for a min heap. This means it increases or decreases down each level of branches. With a Binary search tree, it uses a left right method where going left will give you smaller values and going right will give you larger values.
2. Heaps can be used for applications such as tracking the priority of projects and creating an order, as it will have higher priorities on top of the list. It is a good dada structure that can have increasing or decreasing values, so it can be uses for ranking or having more important things on top.