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COSC 320 --- 001 Lab 8 4/5/2025

Lab report: In this lab, we were given the header files for the miniPQ class structure, and the implementation to fill out for the procReqRec class structure. We were asked to write a main function that would implement these class structures to create a priority queue of processes. This exercise took me about an hour to finish, cumulatively.

Pre-lab:

1. Understand what we learned about priority queue and read the related book materials.
2. Read and understand the header files: d_pqueue.h, d_heap.h

Exercise 1:

```
//============================================================
// Filename: lab_08.cpp
// Author: Ryan Ellis
// Creation Date: 4/1/2025
// Last Update: 4/4/2025
// Description: Main program that implements the miniPQ and preqrec class
// structure and tests the insertion and pop funcitons in a priority queue.
//============================================================

#include "d_pqueue.h"
#include "preqrec.h"
#include <iostream>
#include <functional>
#include <ctime>

using namespace std;

int main (){

   srand(time(0));     //set time seed

   const int INTRANGE = 39;        //random priority values
   string alpha[10] = {"A", "B", "C", "D", "E", "F", "G", "H", "I", "J"};  //string array for queue names

   miniPQ<procReqRec, less<procReqRec>> mpq;   //miniPQ object

   for(int i = 0; i < 10; i++){    //for loop to set and push processes

      int randP = rand()% + INTRANGE;
      procReqRec proc("Process " + alpha[i], randP);
      mpq.push(proc);

   }
```

```
    while (!mpq.empty()){    //while queue not empty, print and pop

        cout<<mpq.top()<<endl;
        mpq.pop();

    }

    return 0;
}
```

Output:

```
ryan@ryan-MacBookPro:~/Documents/COSC 320/Labs/Lab 8/Lab 8$ ./prog
Process C : 3
Process A : 5
Process J : 6
Process B : 9
Process E : 10
Process H : 11
Process D : 14
Process F : 18
Process I : 23
Process G : 29
ryan@ryan-MacBookPro:~/Documents/COSC 320/Labs/Lab 8/Lab 8$ ./prog
Process A : 0
Process G : 10
Process E : 12
Process B : 15
Process J : 15
Process I : 16
Process D : 28
Process H : 30
Process C : 32
Process F : 37
ryan@ryan-MacBookPro:~/Documents/COSC 320/Labs/Lab 8/Lab 8$
```