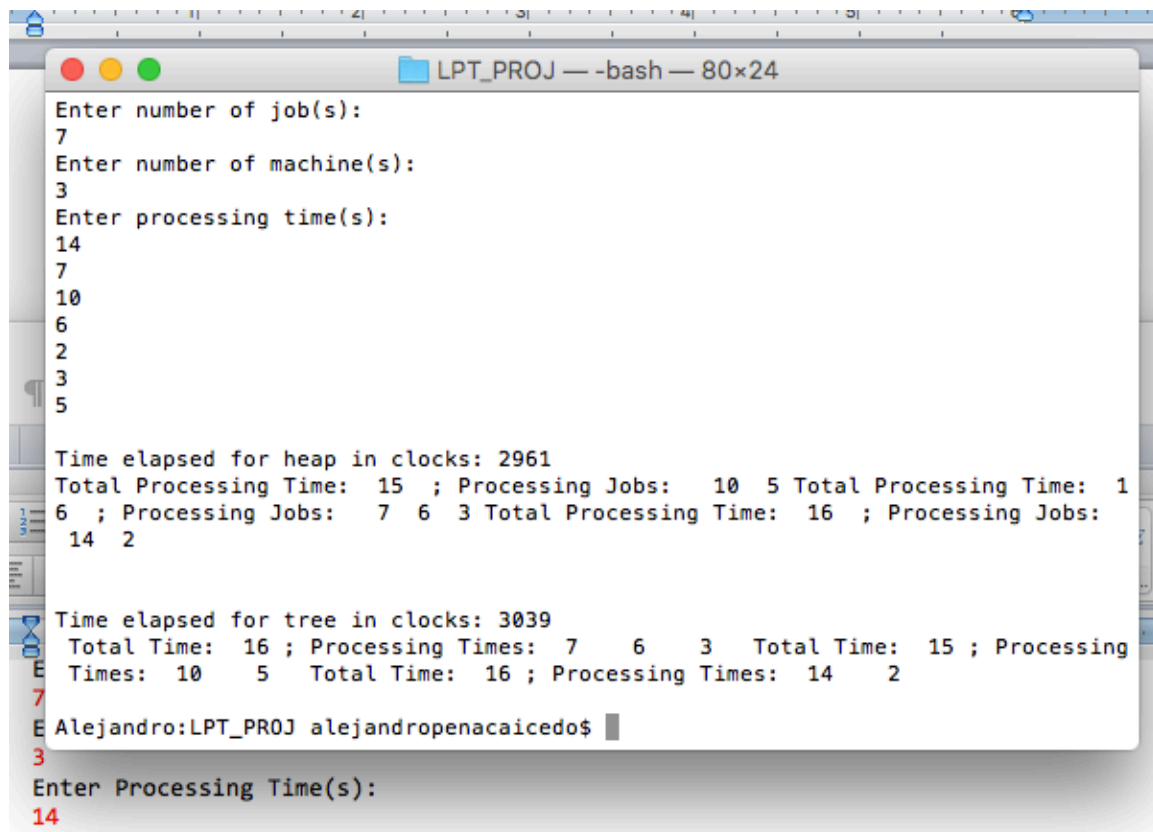


Explanation

I created two classes each representing a minimum priority queue, the first implementation used an array-based min-heap. The second implementation used a pointer-based min height-biased leftist tree. The LPT part of this assignment was implemented in each class using a struct that represented the machines. The most important parts of the structs were the dynamic array used to hold the processing times and a variable that held the total time for each machine. For both the heap and the tree, the machine struct with the smallest total time variable would rise to either the first element of the array or the first node of the tree. In general, the heap performed at a faster time than the tree.

Testing

Test 1:



```
LPT_PROJ — -bash — 80x24
Enter number of job(s):
7
Enter number of machine(s):
3
Enter processing time(s):
14
7
10
6
2
3
5

Time elapsed for heap in clocks: 2961
Total Processing Time: 15 ; Processing Jobs: 10 5 Total Processing Time: 1
6 ; Processing Jobs: 7 6 3 Total Processing Time: 16 ; Processing Jobs:
14 2

Time elapsed for tree in clocks: 3039
Total Time: 16 ; Processing Times: 7 6 3 Total Time: 15 ; Processing
Times: 10 5 Total Time: 16 ; Processing Times: 14 2
E Alejandro:LPT_PROJ alejandropenacaicedo$
3
Enter Processing Time(s):
14
```

Test 2:

```
LPT_PROJ — -bash — 80x24
[Alejandro:LPT_PROJ alejandropenacaicedo$ ./test
Enter number of job(s):
20
Enter number of machine(s):
4
Enter processing time(s):
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
12
13
14
15
16
17
18
19
20

Time elapsed for heap in clocks: 3595
Total Processing Time: 51 ; Processing Jobs: 17 16 9 8 1 Total Processing Time: 53 ; Processing Jobs: 19 14 11 6 3 Total Processing Time: 52 ; Processing Jobs: 18 15 10 7 2 Total Processing Time: 54 ; Processing Jobs: 20 13 12 5 4

Time elapsed for tree in clocks: 3732
Total Time: 54 ; Processing Times: 20 13 9 8 4 Total Time: 52 ; Processing Times: 18 15 11 6 2 Total Time: 53 ; Processing Times: 19 14 10 7 3 Total Time: 51 ; Processing Times: 17 16 12 5 1

Alejandro:LPT_PROJ alejandropenacaicedo$
```

Test 3:

```
LPT_PROJ — -bash — 80x24

[Alejandro:LPT_PROJ alejandropenacaicedo$ ./test
Enter number of job(s):
15
Enter number of machine(s):
3
Enter processing time(s):
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

Time elapsed for heap in clocks: 3359
```

```
LPT_PROJ — -bash — 80x24

5
6
7
8
9
10
11
12
13
14
15

Time elapsed for heap in clocks: 3359
Total Processing Time: 39 ; Processing Jobs: 13 12 7 6 1 Total Processin
g Time: 41 ; Processing Jobs: 15 10 9 4 3 Total Processing Time: 40 ;
Processing Jobs: 14 11 8 5 2

Time elapsed for tree in clocks: 3447
Total Time: 41 ; Processing Times: 15 10 8 5 3 Total Time: 40
; Processing Times: 14 11 9 4 2 Total Time: 39 ; Processing Time
s: 13 12 7 6 1

Alejandro:LPT_PROJ alejandropenacaicedo$
```