CMPE 322

Project 2: Implementing a New Scheduler for Minix

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Emotional Process Scheduler

```
double alpha = 0.1;
double beta = 0.8;
if(rmp->priority > 7 && rmp->priority < 15){ /* avoid kernel */
        int r1 = rmp->priority;
        /* randomize */
        r1 = (21401213*r1+2531011);
        r1 = (r1>>16)&0x7FFF;
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        r1 = (r1>>16)&0x7FFF;
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        r1 = (21401213*r1+2531011);
        r1 = (r1>>16)&0x7FFF;
        double temp = r1;
        while(temp >= 1){
                temp = temp / 10;
        }
        if(alpha < temp){
                int r2 = (21401213*r1+2531011);
                r2 = (r2>>16)&0x7FFF;
                temp = r2;
                while(temp >= 1){
                        temp = temp / 10;
                }
                if(temp > beta){ /* we liked the process */
                        rmp->priority -= 1;
                        if(rmp->time_slice<400)   rmp->time_slice *= 1.2;
                }else{ /* we hates it forever! */
                        rmp->priority += 1;
                        if(rmp->time_slice>50)    rmp->time_slice *= 0.8;
                }
        }
}
```

This is the code I added to *minix/src/servers/sched/schedule.c.* According to a process' priority, which is between 8 and 14 included, generates a random value. According to that value, either likes or dislikes the process. I know it's not the best randomization, but since the priority of a process changes, next time it will generate a new random number. I added two more constraints for changing the time slice because without them, after a while my Minix wasn't able to schedule processes. This is a permanent change since it changes the priority of the process permanently. I'm not putting a process with priority m to the nth queue. I declared alpha & beta values locally. Which means when I change them by hand, I had to recompile the kernel to see the results.

Alpha and Beta Values

I used 5 different alpha and beta couples:

- (0.1, 0.8) :
  - Smaller alpha value means new priority and time slice will havily depend on the second randomly-generated number. Since beta is considerably high, we expect our processor to hate the incoming process.
- (0.9, 0.5) :
  - Larger alpha value means mostly we should act neutral.
- (0.3, 0.8) :
  - Similar to the second case, but with a larger alpha. Which should result in more neutral decisions.
- (0.5, 0.5) :
  - We expect 50% of the time to act neutral. If not, scheduler should either like the process or not, with equal probability.
- (0.1, 0.1) :
  - Similar to the second case, but this time we expect the scheduler to like most of the incoming processes.

→ Folder names format:

alpha = 0.x;

beta = 0.y;

Relevant folder name will be:

axby