CS492 HW 1

1. CPU Utilization is 1-P^n. P = .4 beacause 40% of time = 40/100 = .4.

n = 6 operations.

1-(.4^6) = 0.9959 = 99%

2. The difference between threads and processes is that multiple threads can share the same memory space where processes occupy one memory space at a time. Threads are generally used for smaller tasks. The biggest advantages of threads in user space are that they can be scheduled to avoid inconvenient stops. Also switching threads in user space is faster because it does not require a trap into the kernel. The biggest disadvantage is if a thread is blocked in a system call, the whole process is blocked because the process will go to sleep.

3. In sequential, each process will execute for 20 minutes and wait for 20 minutes. 20+20=40, Therefore the whole operation will take 80 minutes to complete as both joprocessbs will need 40 minutes.. In Parallel we need to find the CPU Utilization. CPU = 1-P^n. N = .5 for 50% usage. P = 2 for the two process. 1-(.5^2) = .75 so 75% CPU utilization. Each process will share this 75% CPU utilization each minute times n processes. .75/2 = .375. Each process requires 20 minutes to complete so 20/.375 = 53.33 minutes.

4. While a single threaded process is waiting for input, it will continue to execute the process and cannot fork during the process. Therefore, this problem will not occur in a single threaded process.

5. So to use multiple threads you would have n threads, n being the number of server mirrors in the set of mirrors. And each thread wood receive a subset of the total bytes and then join the bytes into the file in memory.

6. The hyperdriver drives the concept of virtualization by allowing the host machine to operate outside machines as virtual machines. An operating system has three main functions, it manages the computer's resources and executes and provide services for applications software. There is no real difference between an OS and hypervisor. Both are pieces of software that facilitate the virtualization of hardware resources for other software. An OS is effectively a hypervisor for user-mode applications.

[www.slideshare.](https://www.google.com/search?q=main+function+of+operating+system&client=safari&rls=en&biw=1680&bih=987&tbm=isch&source=iu&ictx=1&fir=V415F92CvG1OdM%253A%252CIwo3YcHlFizCoM%252C_&usg=AI4_-kQE-hTgkD_kyEZIsx6kLJxvDrEHjQ&sa=X&ved=2ahUKEwjzxvblt93gAhUjnOAKHVbEBpEQ9QEwAHoECAAQBg#imgrc=V415F92CvG1OdM:)