REPORT

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The program takes 6 integers named k,m,n,a,b,l,u respectively as input from inp.txt file and creates an output file called 'output.txt'.

The program contains 4 functions
1. getsysTime()
2. fun_family()
3. fun_cook()
4. main()

1.Main function(): The main function takes input from inp.txt and initializes the semaphore trays, creates k family threads and 1 cook thread and prints the line "k threads are created" to the output.txt and waits for all threads to join. After every family thread and the cook thread is executed, the main thread computes average waiting time to refill and average waiting time to refill. And prints the values of waiting times to the output.txt. And finally exits destroying the semaphore trays.

2. getsysTime(): The function calculates the time at that instant using chrono in the format hrs:min:sec.milliseconds. And returns the calculated time to the caller function in the form of a string.

3. fun_family(): This function takes an integer id as an input and generates two exponential distributions according to the input. Each family thread executes this function, starts saying that they are hungry and waits for an ice cream tray if no.of trays are zero then they wait for the cook to refill them. After waiting for ice cream they get them and eat them(we simulate them by waiting for a time which follows exponential distribution with average alpha (a here)) and then do community service. We simulate it by waiting for a time which follows exponential distribution with average beta (b here). After doing community service, they will become hungry again and will wait to get ice cream. They do this till they eat ice cream n times.
Then, they calculate the average time they waited to get the ice cream.
After eating and doing community service they exit.

4. fun_cook(): This function generates two exponential distributions according to the input. The cook/vendor executes this function he sleeps till all the ice cream trays become empty. If all the trays become empty he put trays in the pot and refills (we simulate this by waiting for a time which follows exponential distribution with average lambda (l here) and exponential distribution mu (u here)). He sleeps again after refilling.

He did this job till all the families did(complete) their job. And calculates the total waiting time in parallel with refilling.