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Lab-7

Part-1:

How to run:

On ubuntu terminal type: gcc latenightpizza.c -pthread;./a.out

Features:

Implements all the desired features, threads were there for different students and one thread is for the pizza delivery which activates when the pizza slices are exhausted

The solution is deadlock free as on pizza slice cannot be shared among students so there is no dependency of resources among students means if pizza slice are unavailable it will call the pizza hut else it will pick up the pizza slice or sleep until pizza arrives

Sample output:

```
0 got pizza slice
2 got pizza slice
3 got pizza slice
1 got pizza slice
1 finishes pizza slice
1 got pizza slice
0 finishes pizza slice
0 ordered pizza and 0 goes to sleep
3 finishes pizza slice
3 goes to sleep
2 finishes pizza slice
2 goes to sleep
1 finishes pizza slice
1 goes to sleep
the pizza is delivered
3 got pizza slice
2 got pizza slice
1 got pizza slice
3 finishes pizza slice
3 got pizza slice
2 finishes pizza slice
2 got pizza slice
3 finishes pizza slice
3 ordered pizza and 3 goes to sleep
1 finishes pizza slice
1 goes to sleep
```

We can see here that if no pizza slice available then the students order pizza and goes to sleep until the pizza arrives or otherwise they pickup the next pizza slice and continue study

Part2:

a) How to run:
gcc barber_monitor.c -pthread;./a.out
Sample output

```
cutsomer 0 sits on the chair
cutsomer 2 sits on the chair
cutsomer 1 sits on the chair
barber engaged with 0
customer 5 is returning(no chairs left)
cutsomer 4 sits on the chair
cutsomer 3 sits on the chair
barber done with 0, 0 leaves
customer 5 has come back after 5 mins
cutsomer 5 sits on the chair
barber engaged with 2
barber done with 2, 2 leaves
barber engaged with 1
barber done with 1, 1 leaves
barber engaged with 4
barber done with 4, 4 leaves
barber engaged with 3
```

All the functionality are implemented using monitors

b) How to run
g++ banker.cpp ;./a.out

Inputs required -> enter number of process
Enter number of resources
Allocation matrix
Max resources required
Then enter the number of resources you want to allocate for what process and it will tell whether the system is still be safe or not