

CSE344
SYSTEM
PROGRAMING
HW3

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Named and Unnamed Semaphore Initialization

-Named:

```
int semaphore_shared = shm_open(argv[4], O_RDWR | O_CREAT, S_IRUSR | S_IWUSR);
if (semaphore_shared == -1) {
    perror("semaphore_shared");
    return -1;
}
if( ftruncate(semaphore_shared, sizeof(sem_t) * 7)==-1)
{
    perror("ftruncate semaphore");
    return -1;
}
```

```
semaphores = mmap(NULL, sizeof(sem_t) * 7, PROT_READ
PROT_WRITE, MAP_SHARED, semaphore_shared, 0);
```

```
sem_init(&semaphores[0], 1, 0);
sem_init(&semaphores[1], 1, 0);
sem_init(&semaphores[2], 1, 0);
sem_init(&semaphores[3], 1, 1);
sem_init(&semaphores[4], 1, 0);
sem_init(&semaphores[5], 1, 0);
sem_init(&semaphores[6], 1, 0);
```

-Unnamed:

```
semaphores = mmap(0, sizeof(*semaphores), PROT_READ | PROT_WRITE,
MAP_SHARED | MAP_ANON, -1, 0);
```

```
sem_init(&semaphores[0], 1, 0);
sem_init(&semaphores[1], 1, 0);
sem_init(&semaphores[2], 1, 0);
sem_init(&semaphores[3], 1, 1);
sem_init(&semaphores[4], 1, 0);
```

```
sem_init(&semaphores[5], 1, 0);  
sem_init(&semaphores[6], 1, 0);
```

the rest is the same,

```
oo = shmget(IPC_PRIVATE, 150*sizeof(struct request), IPC_CREAT | 0666);  
o = (struct request*) shmat(oo, NULL, 0);  
    shared memory initilization(read file attach shared memory)
```

Wholosaler :

```
void wholesaler(int size, struct request *o, char* filepath)  
{  
    while(*glob_var < size-1)  
    {  
        Deliver(o[*glob_var].buf[0], o[*glob_var].buf[1]);  
  
        sem_post(&semaphores[0]);  
  
        sem_wait(&semaphores[5]);  
        waitingDessert();  
        sem_post(&semaphores[6]);  
  
        sem_wait(&semaphores[1]);  
  
        obtained();  
  
        sem_post(&semaphores[2]);  
  
        done(*glob_var+1);  
        sem_wait(&semaphores[4]);  
        *glob_var = *glob_var+1;  
  
        write(STDOUT_FILENO, "\n", 1);  
  
    }  
}
```

Chef :

```
void cheff(int size,struct request *o,struct Chef chef)
{
    Supply(chef.number,chef);
    while(*glob_var<size)
    {
        sem_wait(&semaphores[0]);
        *glob=1;

        if((o[*glob_var].buf[0]==chef.ingredient[0] && o[*glob_var].buf[1]==chef.ingredient[1])
        {

            taken(chef.number,o[*glob_var].buf[0],o[*glob_var].buf[1]);
            prepare(chef.number);
            sem_post(&semaphores[5]);
            sem_wait(&semaphores[6]);
            finishDessert(chef.number);
            sem_post(&semaphores[1]);
            sem_wait(&semaphores[2]);
            waiting(chef.number,chef.ingredient[0] ,chef.ingredient[1]);
            sem_post(&semaphores[4]);

        }
        else
        {
            sem_post(&semaphores[0]);
            *glob=1;
        }
        if(*glob_var==size-2)
        {
            break;
        }
    }
}
```

semaphores[0] : When wholesaler deliver ingredient,post and triggered process.

semaphores[1] : makes the wholesaler wait until the chef makes the dessert.

semaphores[2] :The semaphore that prints the wholesaler's take after the chef has finished the dessert.

Semaphores[3] : between write semaphore

Semaphores[4] : All prints are printed and passed from shared memory to other ingredient.

Semaphores[5] : Print waiting when chef make dessert

OUTPUT

```
the wholesaler delivers milk and flour
chef4 (13886) has taken the milk
chef4 (13886) has taken the flour
chef4 (13886) is preparing the dessert
the wholesaler (13882) is waiting for the dessert
chef4 (13886) has delivered the dessert
the wholesaler (13882) has obtained the dessert and left
the wholesaler (13882) is done (total desserts: 2)
chef4 (13886) is waiting for milk and flour
```

```
the wholesaler delivers walnuts and sugar
chef1 (13883) has taken the walnuts
chef1 (13883) has taken the sugar
chef1 (13883) is preparing the dessert
the wholesaler (13882) is waiting for the dessert
chef1 (13883) has delivered the dessert
the wholesaler (13882) has obtained the dessert and left
the wholesaler (13882) is done (total desserts: 3)
chef1 (13883) is waiting for walnuts and sugar
```

```
the wholesaler delivers milk and sugar
chef6 (13888) has taken the milk
chef6 (13888) has taken the sugar
chef6 (13888) is preparing the dessert
the wholesaler (13882) is waiting for the dessert
chef6 (13888) has delivered the dessert
the wholesaler (13882) has obtained the dessert and left
the wholesaler (13882) is done (total desserts: 4)
chef6 (13888) is waiting for milk and sugar
```

```
the wholesaler delivers milk and walnuts
chef5 (13887) has taken the milk
chef5 (13887) has taken the walnuts
chef5 (13887) is preparing the dessert
the wholesaler (13882) is waiting for the dessert
chef5 (13887) has delivered the dessert
the wholesaler (13882) has obtained the dessert and left
the wholesaler (13882) is done (total desserts: 5)
chef5 (13887) is waiting for milk and walnuts
```

```
the wholesaler delivers flour and sugar
chef3 (13885) has taken the flour
chef3 (13885) has taken the sugar
chef3 (13885) is preparing the dessert
the wholesaler (13882) is waiting for the dessert
chef3 (13885) has delivered the dessert
the wholesaler (13882) has obtained the dessert and left
the wholesaler (13882) is done (total desserts: 6)
chef3 (13885) is waiting for flour and sugar
```