I have used 12 semaphores to solve this problem. One of them makes wholesaler's helper process wait until wholesaler reads the ingredients from the given file. In part of the homework which wants named semaphores, its name taken from command line arguments. One of them prevents the pushers from working at the same time. Four of them are used by pushers to notify each other. Six of them are used to make the chef know the ingredients waited for are ready.

Hard part was controlling semaphores. For the named part, I gave used semaphore's names as arguments to child processes. Different pusher and chef processes use different semaphores. I saved the order of them and I used them in the same order I saved. So that program does not wait for the same semaphore in different chef processes so program runs correctly. In shared memory, only 6 char is hold. 2 of them holds taken ingredients, and 4 of them is used as boolean values by pusher processes.

For the unnamed part, I converted the named semaphores into unnamed semaphores. Previously given names are assigned to numbers. Wholesaler gives them as parameters to the child processes. So child processes know what is the index of the semaphore they should use. In shared memory, there are enough space for semaphores and 6 number of chars. Six chars are used as it they are used in named part.

When the program ends, wholesaler notifies and waits for all of its children to exit. It takes return values of them. Only chef processes returns nonzero integers (If there is no error). It adds them and shows total number of güllaç prepared.

Input files should be in the same directory with makefile.

Test named:

```
mustafa@mustafa-Aspire-A515-52G:/media/mustafa/Yerel Disk 2/3_Sınıf_2_Donem/Syst
mustafa@mustafa-Aspire-A515-52G:/media/mustafa/Yerel Disk 2/3_Sınıf_2_Donem/Syst
 Programming/hw3/hw3$ ./hw3named -i 1.txt -n name
chef1 (pid 25449) is waiting for milk and walnuts
chef2 (pid 25450) is waiting for flour and walnuts
the wholesaler (pid 25448) delivers flour and sugar
the wholesaler (pid 25448) is waiting for the dessert
chef3 (pid 25451) is waiting for flour and milk
chef4 (pid 25452) is waiting for sugar and walnuts
chef6 (pid 25454) is waiting for flour and sugar
chef5 (pid 25453) is waiting for milk and sugar
chef6 (pid 25454) has taken the flour
chef6 (pid 25454) has taken the sugar
chef6 (pid 25454) is preparing the dessert
chef6 (pid 25454) has delivered the dessert
the wholesaler (pid 25448) has obtained the dessert and left
the wholesaler (pid 25448) delivers flour and walnuts
the wholesaler (pid 25448) is waiting for the dessert
chef2 (pid 25450) has taken the flour
chef2 (pid 25450) has taken the walnuts
chef2 (pid 25450) is preparing the dessert
chef2 (pid 25450) has delivered the dessert
the wholesaler (pid 25448) has obtained the dessert and left
the wholesaler (pid 25448) delivers milk and sugar
the wholesaler (pid 25448) is waiting for the dessert
chef5 (pid 25453) has taken the milk
chef5 (pid 25453) has taken the sugar
chef5 (pid 25453) is preparing the dessert
chef5 (pid 25453) has delivered the dessert
the wholesaler (pid 25448) has obtained the dessert and left
the wholesaler (pid 25448) delivers sugar and walnuts
the wholesaler (pid 25448) is waiting for the dessert
chef4 (pid 25452) has taken the sugar
chef4 (pid 25452) has taken the walnuts
chef4 (pid 25452) is preparing the dessert
chef4 (pid 25452) has delivered the dessert
the wholesaler (pid 25448) has obtained the dessert and left
chef6 (pid 25454) is exiting
chef1 (pid 25449) is exiting
chef5 (pid 25453) is exiting
chef3 (pid 25451) is exiting
chef4 (pid 25452) is exiting
chef2 (pid 25450) is exiting
the wholesaler (pid 25448) is done (total desserts: 4)
mustafa@mustafa-Aspire-A515-52G:/media/mustafa/Yerel Disk 2/3_S
 Programming/hw3/hw3$
```

Open ▾

```
FS
WF
MS
WS
```

Unnamed test:

```
mustafa@mustafa-Aspire-A515-52G:/media/mustafa/Yerel Disk 2/3_Sınıf_2_Donem/Syst
 Programming/hw3/hw3$ ./hw3unnamed -i 1.txt
the wholesaler (pid 25561) delivers flour and sugar
the wholesaler (pid 25561) is waiting for the dessert
chef2 (pid 25563) is waiting for flour and walnuts
chef1 (pid 25562) is waiting for milk and walnuts
chef3 (pid 25564) is waiting for flour and milk
chef4 (pid 25565) is waiting for sugar and walnuts
chef5 (pid 25566) is waiting for milk and sugar
chef6 (pid 25567) is waiting for flour and sugar
chef6 (pid 25567) has taken the flour
chef6 (pid 25567) has taken the sugar
chef6 (pid 25567) is preparing the dessert
chef6 (pid 25567) has delivered the dessert
the wholesaler (pid 25561) has obtained the dessert and left
the wholesaler (pid 25561) delivers flour and walnuts
the wholesaler (pid 25561) is waiting for the dessert
chef2 (pid 25563) has taken the flour
chef2 (pid 25563) has taken the walnuts
chef2 (pid 25563) is preparing the dessert
chef2 (pid 25563) has delivered the dessert
the wholesaler (pid 25561) has obtained the dessert and left
the wholesaler (pid 25561) delivers milk and sugar
the wholesaler (pid 25561) is waiting for the dessert
chef5 (pid 25566) has taken the milk
chef5 (pid 25566) has taken the sugar
chef5 (pid 25566) is preparing the dessert
chef5 (pid 25566) has delivered the dessert
the wholesaler (pid 25561) has obtained the dessert and left
the wholesaler (pid 25561) delivers sugar and walnuts
the wholesaler (pid 25561) is waiting for the dessert
chef4 (pid 25565) has taken the sugar
chef4 (pid 25565) has taken the walnuts
chef4 (pid 25565) is preparing the dessert
chef4 (pid 25565) has delivered the dessert
the wholesaler (pid 25561) has obtained the dessert and left
chef1 (pid 25562) is exiting
chef5 (pid 25566) is exiting
chef2 (pid 25563) is exiting
chef6 (pid 25567) is exiting
chef3 (pid 25564) is exiting
chef4 (pid 25565) is exiting
the wholesaler (pid 25561) is done (total desserts: 4)
mustafa@mustafa-Aspire-A515-52G:/media/mustafa/Yerel Disk 2/3_S
 Programming/hw3/hw3$
```

Open ▾

```
FS
WF
MS
WS
```

1.txt   input.txt   Makefile   named   unnamed