AOS Assignment 4

List of files created:

1) future.h: This is the header file. It includes declaration for the following:
   - Future states – FUTURE_EMPTY, FUTURE_WAITING, FUTURE_VALID
   - Future mode – FUTURE_EXCLUSIVE
   - Structure of future
   - System calls – future_alloc(), future_free(), future_get(), future_set()

   Created by: Amruta

2) xsh_prodcons.c: This file is modified such that when command prodcons with argument -f is executed futures are created and scheduled. Without this argument, producer-consumer synchronization would be executed.
   Created by: Ajinkya and Amruta

3) future_cons.c: This is the code for consumer process which calls future_get() to consume the value if present within the future. If the value is not present, then it waits for the producer process to produce the value in the future. Once the value is consumed i.e. printed on console, future_free() is called.
   Created by: Ajinkya

4) future_prod.c: This is the code for producer process which produces values and calls future_set() to set the value within the future.
   Created by: Amruta

5) System calls:
   future_alloc.c: Allocates memory for the future by calling getmem().
   future_free.c: Clears memory used by the future by calling freemem().

   Created by: Ajinkya and Amruta

   We have implemented futures with busy waiting in this assignment. The same can be implemented with resched() which is implemented and commented in the code. This makes use of fwait() and fsignal() functions as mentioned below:

6) fwait.c: This file includes creation of system call 'fwait' to put the future in waiting state. In this file, the state of future is updated to FUTURE_WAITING, the current process is put into wait state and resched() is called.
   Created by: Ajinkya

7) fsignal.c: This file includes creation of system call 'fsignal' which signals the process after the value is set in future.
   Created by: Ajinkya