ADVANCED OPERATING SYSTEMS (FA15-BL-CSCI-P536-36187)

Assignment 5 - Futures Part 2

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Tasks done by us and functions in the assignment

Principally we have created these files

../include/cqueue.c - It contains the declaration for QueueItem and the Queue data structures. It also has the prototypes for all the functions on Queue declared in it.

../system/cqueue.c - It contains the definitions of all the functions declared in the above file.

../test/ folder - It contains the test configurations which enable easy debugging of the newly created functionalities.

And modified a few

future_alloc.c - It allocates a future and initializes it with the state as FUTURE_EMPTY and the pid as NULL PROC

future_free.c- It will deallocate the memory allocated to the future.

future_get.c - It waits for the value to be added to the future and if the value is not available (means the state is FUTURE_EMPTY) it waits on it to be produced. The additional modes of FUTURE_SHARED give a many to one functionality and FUTURE_QUEUE gives a many to many functionality.

future_set.c - It sets the value for the future and sets it state to FUTURE_VALID. Now again there are two queues of get_queue and set_queue which are filled with a suspended process id when

- There is no producer to set the value of the semaphore
- There is no consumer to get the set value of the semaphore

respectively. When a corresponding item appears in the opposite queue, its corresponding counterpart is removed and resumed.

../include/future.h - It contains the modified definition of the Future with the addition of a get_queue and a set_queue.

xsh_prodcons.c - We have added handling for a flag "-f" which switches the semaphore based logic of producer consumer to futures implementation.

Tasks

Pralhad Sapre - Modified the files future.h, implemented the functionality for FUTURE_QUEUE state and modified xsh_prodcons.c

Srivatsan Iyer - Created the files queue.h, queue.c and implemented functionality for FUTURE_SHARED, test configuration