```
/*******************************************************************************
 Module
    Round3HSM.c

 Description
    This is a template file for implementing state machines.


*******************************************************************************/
/*------------------------------ Include Files ------------------------------*/
// Basic includes for a program using the Events and Services Framework
#include "ES_Configure.h"
#include "ES_Framework.h"
#include <stdio.h>

/* Include header files for this state machine as well as any machines at the
 next lower level in the hierarchy that are sub-machines to this machine
 */
#include "Round3HSM.h"

/*------------------------------ Module Defines -----------------------------*/
// define constants for the states for this machine
// and any other local defines

/*---------------------------- Module Functions ---------------------------*/
/* prototypes for private functions for this machine, things like during
 functions, entry & exit functions.They should be functions relevant to the
 behavior of this state machine
 */
static ES_Event DuringCharging3HSM(ES_Event Event);

/*---------------------------- Module Variables ---------------------------*/
// everybody needs a state variable, you may need others as well
static Round3State_t CurrentState;

/*------------------------------ Module Code ------------------------------*/
/*******************************************************************************
 Function
    RunRound3HSM

 Parameters
    ES_Event: the event to process

 Returns
    ES_Event: an event to return

 Description
    add your description here


*******************************************************************************/
ES_Event RunRound3HSM(ES_Event CurrentEvent)
{
    unsigned char MakeTransition = false; // are we making a state
transition?
    Round3State_t NextState = CurrentState;
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    ES_Event EntryEventKind = {ES_ENTRY,0}; // default to normal entry to new
state
    ES_Event ReturnEvent = CurrentEvent; // assume we are not consuming event
    ES_Event PostEvent;

#ifdef PRINT_ROUND3_HSM_CALLS

    printf("RunRound3HSM\n\r");

#endif

    switch(CurrentState)
    {
        case Charging3:

            #ifdef PRINT_ROUND3_HSM_STATES

                printf("Charging3\n\r");

            #endif

            // Execute During function for Charging. ES_ENTRY & ES_EXIT are
processed here allow the lower level state machines to re-map or consume the
event
            CurrentEvent = DuringCharging3HSM(CurrentEvent);
            // Process any events
            if(CurrentEvent.EventType != ES_NO_EVENT) // if an event is
active
            {
                switch(CurrentEvent.EventType)
                {


                                        case ES_TIMEOUT :

                                            if(CurrentEvent.EventParam ==
LANCE_DELAY_TIMER)

                                            {
                                                    PostEvent.EventType =
LowerLance;

        PostMasterHSM(PostEvent);


                                            }

                                            else if(CurrentEvent.EventParam
== SHOOTING_DELAY_TIMER)

                                            {
                                                    PostEvent.EventType =
Fire_All_Balls;

        PostMasterHSM(PostEvent);


                                            }

                                            break;
```

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                }
            }
          break;


     }




    //   If we are making a state transition
    if (MakeTransition == true)
    {
        // Execute exit function for current state
        CurrentEvent.EventType = ES_EXIT;
        RunRound3HSM(CurrentEvent);

        CurrentState = NextState; //Modify state variable

        // Execute entry function for new state
        // this defaults to ES_ENTRY
        RunRound3HSM(EntryEventKind);
    }
    return(ReturnEvent);
}
/*****************************************************************************
 Function
    StartRound3HSM

 Parameters
    None

 Returns
    None

 Description
    Does any required initialization for this state machine


*****************************************************************************/
void StartRound3HSM(ES_Event CurrentEvent)
{

    // local variable to get debugger to display the value of CurrentEvent
    ES_Event LocalEvent = CurrentEvent;

    #ifdef PRINT_ROUND3_HSM_CALLS

        printf("StartRound3HSM\n\r");

    #endif

    // to implement entry to a history state or directly to a substate
    // you can modify the initialization of the CurrentState variable
    // otherwise just start in the entry state every time the state machine
    // is started
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    if(ES_ENTRY_HISTORY != CurrentEvent.EventType)
    {
        CurrentState = Charging3;
    }
    // call the entry function (if any) for the ENTRY_STATE
    RunRound3HSM(CurrentEvent);
}

/*****************************************************************************
 Function
    QueryRound3HSM

 Parameters
    None

 Returns
    Round3State_t The current state of the Template state machine

 Description
    returns the current state of the Template state machine


*****************************************************************************/
Round3State_t QueryRound3HSM(void)
{

    #ifdef PRINT_ROUND3_HSM_CALLS

        printf("QueryRound3HSM\n\r");

    #endif

    return(CurrentState);
}

/*****************************************************************************
 private functions
 *****************************************************************************/
static ES_Event DuringCharging3HSM(ES_Event Event)
{
    ES_Event ReturnEvent = Event; // assmes no re-mapping or comsumption


    #ifdef PRINT_ROUND3_HSM_CALLS

        printf("DuringCharging3HSM\n\r");

    #endif

    // Process ES_ENTRY, ES_ENTRY_HISTORY, and ES_EXIT events
    if((Event.EventType == ES_ENTRY) || (Event.EventType ==
ES_ENTRY_HISTORY))
    {
                // Implement any entry actions required for this state machine

        // after that start any lower level machines that run in this state
                Event.EventParam = 1;
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        StartDrivingHSM(Event);
                StartShootingSM(Event);
                StartJoustingSM(Event);

                ES_Timer_SetTimer(SHOOTING_DELAY_TIMER,
SHOOTING_DELAY_INTERVAL_MS);
        ES_Timer_StartTimer(SHOOTING_DELAY_TIMER);

                ES_Timer_SetTimer(LANCE_DELAY_TIMER, LANCE_DELAY_INTERVAL_MS);
        ES_Timer_StartTimer(LANCE_DELAY_TIMER);

        // repeat the StartxxxSM() functions for concurrent state machines on
the lower level

    }
    else if(Event.EventType == ES_EXIT)
    {
        // on exit, give the lower levels a chance to clean up first
        RunDrivingHSM(Event);
                StopShootingSM(Event);
                StopJoustingSM(Event);

        // repeat for any concurrently running state machines

        // now do any local exit functionality

    }
    else // do the 'during' function for this state
    {
        // run any lower level state machine
        RunDrivingHSM(Event);
                RunShootingSM(Event);
                RunJoustingSM(Event);

        // repeat for any concurrent lower level machines

        // do any activity that is repeated as long as we are in this state
    }
    // return either Event, if you don't want to allow the lower level
machine
    // to remap the current event, or ReturnEvent if you do want to allow it.
    return(ReturnEvent);
}
```