RTOS Design Example (5A)

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Based on

Traffic Light Implementation Using uC/OS- a project in Real time systems Course
G. Jochum, et al. Oakland University

http://people.cst.cmich.edu/yelam1k/asee/proceedings/2012/Full%20Papers/Jochum.pdf

Task Example in uCOS

```
void MyTask (void *pdata)
{
    for (;;) {
        Call one of uC/OS-II's services:
        OSMboxPend();
        OSQPend();
        OSSemPend();
        OSTaskDel(OS_PRIO_SELF);
        OSTaskSuspend(OS_PRIO_SELF);
        OSTimeDly();
        OSTimeDlyHMSM();
    }
}
```

Task Schedule Example

```c
void OSSched (void)
{
    INT8U y;

    OS_ENTER_CRITICAL();
    if ((OSLockNesting | OSIntNesting) == 0) {
        y = OSUnMapTbl[OSRdyGrp];
        OSPrioHighRdy = (INT8U) ((y << 3) + OSUnMapTbl[OSRdyTbl[y]]);
        if (OSPrioHighRdy != OSPrioCur) {
            OSTCBHIghRdy = OSTCBPrioTbl[OSPrioHighRdy];
            OSCtxSwCtr++;
            OS_TASK_SW();
        }
    }
    OS_EXIT_CRITICAL();
}
```

Schedule Lock Example

```
void OSSchedLock (void)
{
    if (OSRunning == TRUE) {
        OS_ENTER_CRITICAL();
        OSLockNesting++;
        OS_EXIT_CRITICAL();
    }
}
```

Schedule Unlock Example

```
void OSSchedUnlock (void)
{
    if (OSRunning == TRUE) {
        OS_ENTER_CRITICAL();
        if (OSLockNesting > 0) {
            OSLockNesting--;
            if ((OSLockNesting | OSIntNesting) == 0 ) {
                OS_EXIT_CRITICAL();
                OSSched();
            } else {
                OS_EXIT_CRITICAL();
            }
        } esle {
            OS_EXIT_CRITICAL():
        }
    }
}
```

References

[1]   http://en.wikipedia.org/
[2]   D.M. Harris, S. L. Harris, "Digital Design and Computer Architecture"