h53huang and y27park

Prelab questions

1. Read the rt\_TypeDef.h \_le and answer the following questions.

\_ What are the purpose of p\_lnk, p\_rlnk, p\_dlnk, and p\_blnk variables in

struct OS\_TCB?

\_ What is the purpose of ret\_val in struct OS\_TCB?

Those variables are link pointers for ready/sem wait list, sem/mbx list backwards, delay list and delay link backwards respectively.

It is the value returned after completing the wait.

2. Read the rt\_Task.c and RTX\_lib.c files and answer the following question.

\_ What is the purpose of variables mp\_tcb and mp\_stack?

It’s the memory pool for TCB allocation and system stack allocation.

3. Read the HAL\_CM3.c file and answer the following questions.

\_ What registers are saved on the task stack? (Hint: check init\_stack function)

\_ How to determine the start and end address of a task stack?

\_ How to determine the current stack pointer of a task?

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P\_TCB->ptask and p\_TCB->stack[0]

p\_TCB->tsk\_stack

4. Read the rt\_Mailbox.c file and answer the following questions.

\_ When a task is blocked with WAIT\_MBX state, it will be resumed once a message

appears in the mailbox (assuming timeout value is set to 0xFFFF). What is the

return code of os\_mbx\_wait() after the task is resumed?

The code is OS\_R\_OK.

\_ Inside the rt\_mbx\_wait() function, there are three return statements. The \_rst

one returns OS\_R\_OK. The last two return OS\_R\_TMO. Does this mean the answer

to the question above is either OS\_R\_OK or OS\_R\_TMO? Why or why not?

The answer to the question is OS\_R\_OK, because it is message sent by the task when it is ready. It is dispatched when OS\_R\_OK code appears.

5. The os\_dly appears in multiple kernel files. It is an ordered list. What is the purpose

of variable os\_dly? What criteria are used to order the items in this list? Can you

use os\_dly list to enqueue TCBs that are waiting for memory blocks in Part B? Why

or why not?

os\_dly is to store the delayed tasks. Priority of tasks are used to order the items in the list. I cannot use os\_dly to enqueue TCBs that are waiting for memory blocks in Part B, because it is OS specific, therefore, I have to use some other functions.