Timers

Exercise 1

Write a program that creates two tasks and two timers: a one-shot timer that expires after 20 seconds and an auto-reload timer that expires at 5 second intervals.

Task 1 is a printing task that waits on a queue for print commands and prints them to the serial port.

Task 2 waits on a binary semaphore and when it gets the semaphore it sends a command to print “aargh” to the printing task.

One shot timer callback gives the binary semaphore and auto-reload timer callback sends a command to print “hello” to the printing task.

Exercise 2

Write a program that monitors buttons SW1 – SW3. When any of the buttons is pressed the green led is switched on and a 5 second timer is started. The timer callback switches green led off. If any of the buttons is pressed when the timer has not expired yet the timer is reset to keep the green led on for additional 5 seconds.

Exercise 3

Write a program that reads commands from the serial port. The program creates two timers: one for inactivity monitoring and one for toggling the green led. If no characters are received in 30 seconds all the characters received so far are discarded and the program prints “[Inactive]”. When a character is received the inactivity timer is started/reset. When enter is pressed the command is processed. The commands are:

- help – display usage instructions
- interval <number> - set the led toggle interval (default is 5 seconds)
- time – prints the number of seconds with 0.1s accuracy since the last led toggle