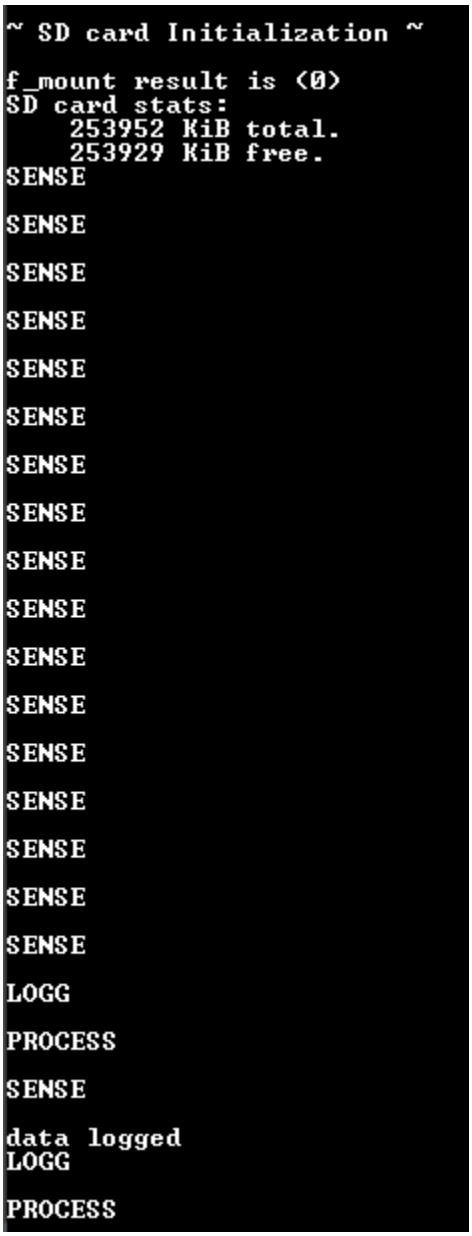
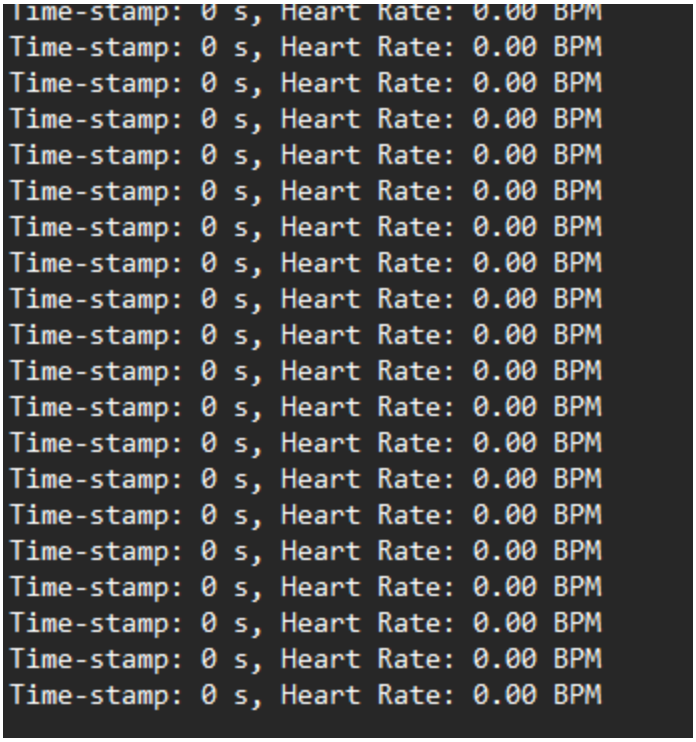
Issues

1. Timing of sensing is very fast while processing moderate and writing to SD card very slow. This causes several issues
    a. Processes getting operated at random frequency with no defined order . this is situation at 1ms tick time. Scheduler was running at 1000HZ and it also halted in processing mode.



    b. Another observation was that since the data was getting recorded one sample at a time then it goes to writing sd card in sequential manner, we were unable to capture the pattern as it was not possible to get the pattern unless we accumulate the enough data samples that captured the trend of peak and trough properly. Below is the data captured from SD card reading



c. Even without pre-emption the situation did not resolve as the high priority task should have been running forever but it didn't happen and the again pre-emption happened and it halted.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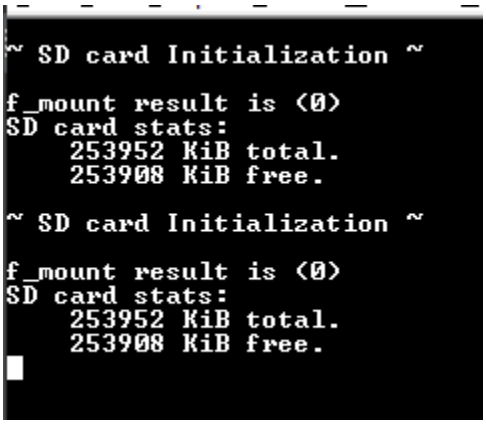
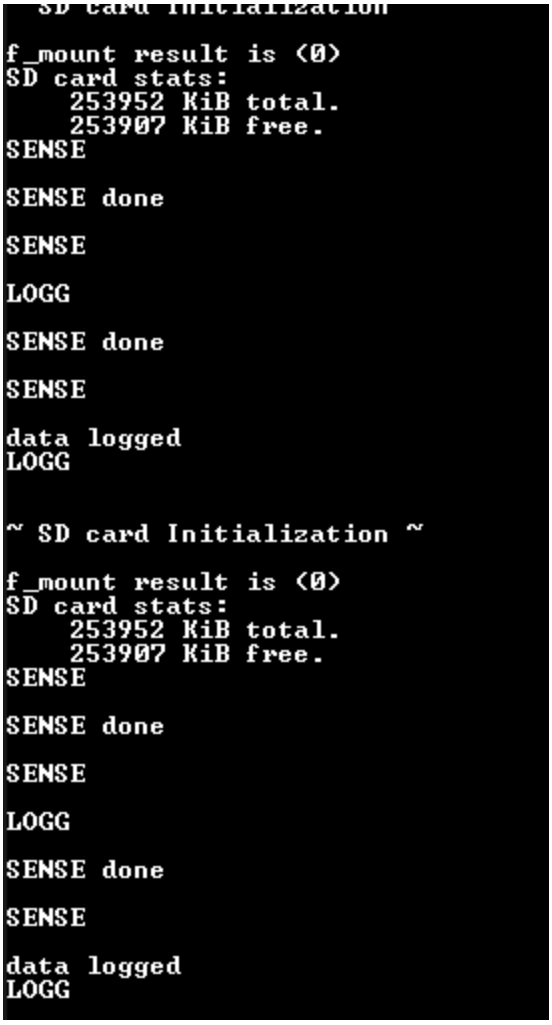
d. Tried holding the sensing task for a minute and storing all the data in queue but still it did not work as nothing was happening
e. Making higher queue size 400 , get the tasks stuck halt as well and it blocked the other tasks. Nothing running at a time



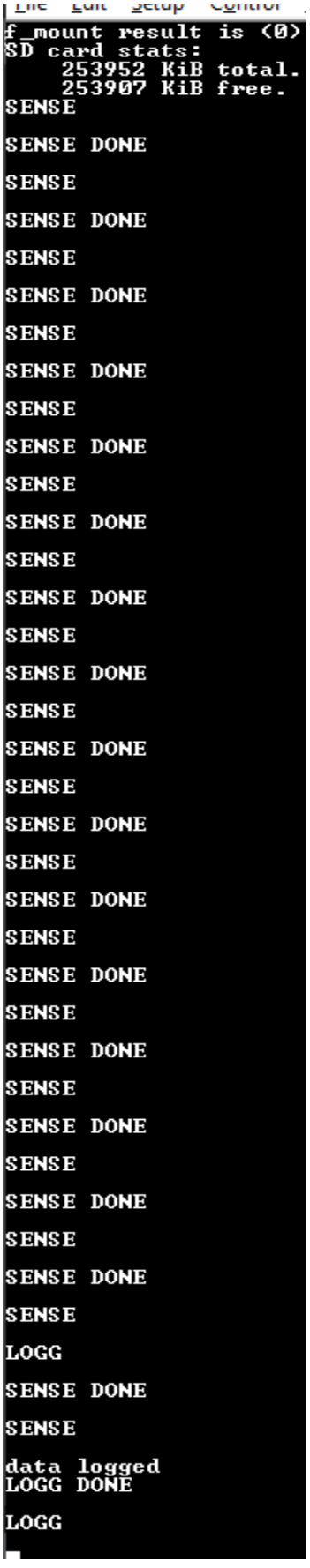
f. After going through the log data I realised , the data was all zero and I was not detecting any peaks because my algorithm was sampling data and for the samples to be processed through filter I needed continuous running stream and that would have been possible with sensing and processing in task so that I could fed continuous stream of data.
Involving the queue was causing the sensing task to block after some time as it could not find the queue empty to put more data then block itself and another task took over. So all of these unsynchronization was causing problems .
Hence I decided to merge the task of sensing and processing so that I could get stable data then try to write those data in logging task.

g. Still the blocking synchronization issue was there I verified with single size queue



First puts one heart rate and then the moment it goes for putting second heart rate , it gets blocked as there is no space so second logger taks takes over and as soon as the logger dequeue the item, it immediately gets pre-empted by the higher priority task which was blocked. Which again finishes the first halfway iteration and then queues another item and then in second round , the halfway dequeing task in progress gets complete but then

h. I tried increasing size of queue to 16 still the deadlock happened after 16 enqueues


File Edit Setup Control
f_mount result is (0)
SD card stats:
253952 KiB total.
253907 KiB free.
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3. The time of different tasks