MINI PROJECT 1

EMBEDDED I/O – GRAPHICS LCD & PERIODIC TIMER INTERRUPTS

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DELIVERABLES FOR PART 2 - CALCULATIONS

1. On line 15 in OS.h I found that 1 ms was equal to 80,000 system ticks. This is clock dependent.

```
// edit these depending on your clock
#define TIME_1MS    80000
#define TIME_2MS    (2*TIME_1MS)
#define TIME_500US  (TIME_1MS/2)
#define TIME_250US  (TIME_1MS/5)
```

2. The PERIOD macro needed to be set so that the timer frequency was 20 Hz (Twice as fast as the heart beat signal measured on the logic analyzer). I used the following calculation to help find my macro value.

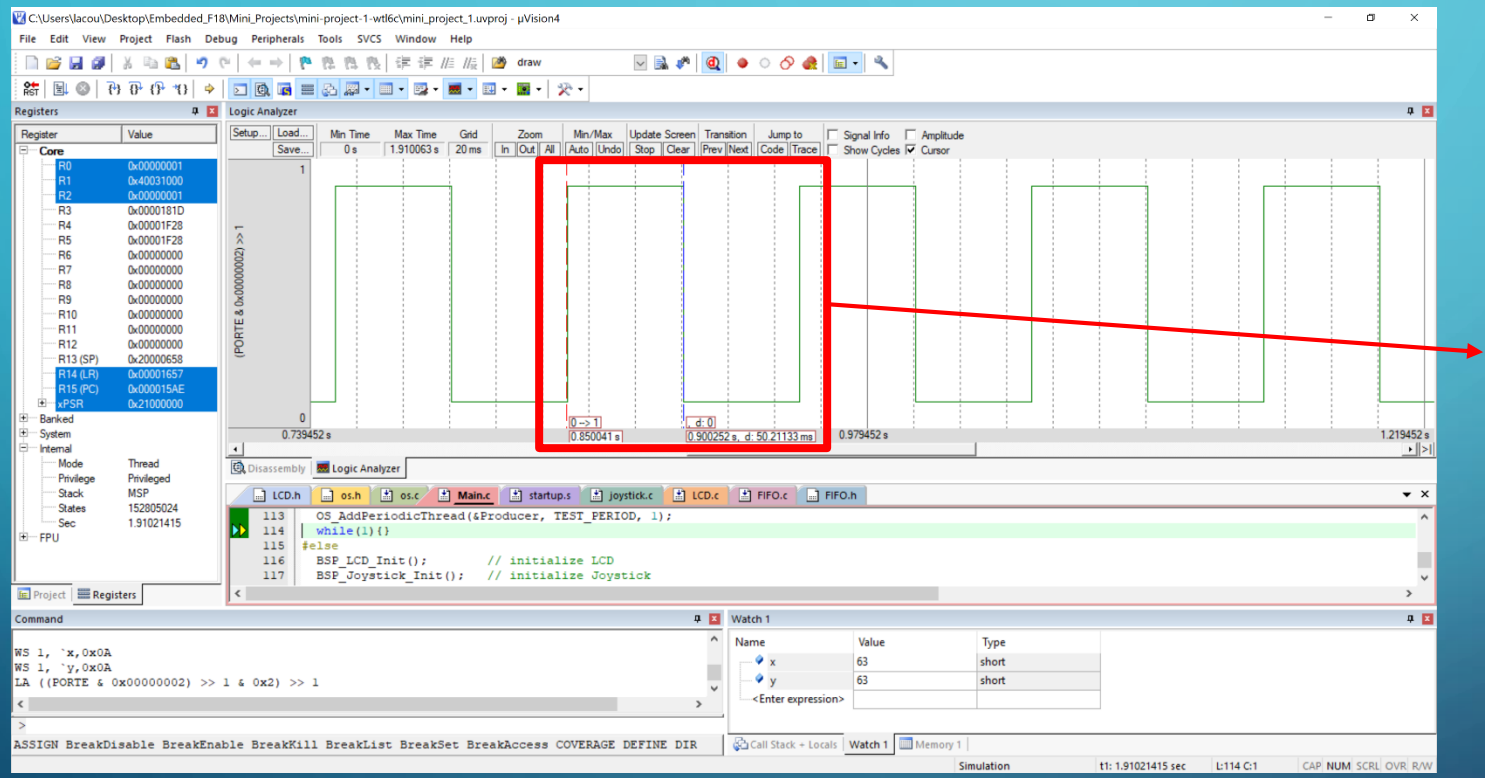
$$Period\ (ms) = \frac{1}{frequency\ (Hz)} = \frac{1}{20} = 50\ ms$$

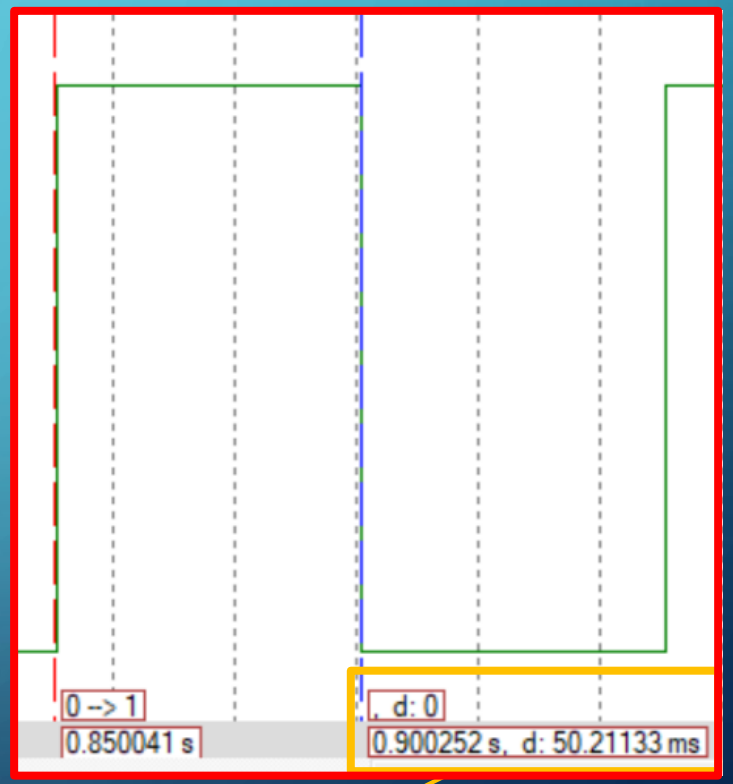
3. After finding that the required timer period was 50 ms I multiplied it by 80000 (1 ms). I knew that since every time the producer ran it would only toggle the heartbeat signal which means it would take two cycles of the timer to produce one cycle of the heartbeat signal. The following slide shows the time for half a cycle of the heartbeat signal which I used to verify my timer frequency of 20Hz. I adjusted the PERIOD macro to get as close as I could to 50ms but the closest I could get was 50.21 ms.

PERIOD = 50 * 80000 = 4,000,000

```
#define TEST_TIMER  0           // Change to 1 if testing the timer
#define TEST_PERIOD 3999999     // Defined by user
#define PERIOD      3999999     // Defined by user
```

DELIVERABLES FOR PART 2 – LOGIC ANALYZER





$$Frequency = \frac{1}{50.211\ ms} = 19.92\ Hz \approx 20\ Hz$$

DELIVERABLES FOR PART 4 – VIDEO

https://drive.google.com/open?id=1HOh3iAts050_gTrf6zec3_pCDCdW7gTO

I made it so that anyone with a UVA email can access this video. I hope this works for you. If it does not I included a file called VIDEO_LINK.txt in my github that you can copy and paste into your browser.

SURVEY SCREENSHOT