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TivaC Lab 9

CPE 403

UNLV DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

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<u>Checklist for Lab 9</u>

☑ *A text/word document of the initial code with comments*

☑ *In the document, for each task submit the modified or included code (only) with highlights and justifications of the modifications. Also include the comments.*

☑ *Provide a permanent link to all main and dependent source code files only (name them as LabXX-TYY, XX-Lab# and YY-task#)Screenshots of debugging process along with pictures of actual circuit*

☑ *Video link of demonstration.*

Code for Experiment

Task 1:

```c
#include <stdint.h>
#include <stdbool.h>
#include <math.h> // Include math functions
#include "inc/hw_memmap.h"
#include "inc/hw_types.h"
#include "driverlib/fpu.h" // Used for floating point
#include "driverlib/sysctl.h"

#define TARGET_IS_BLIZZARD_RB1   //Used to access API's in ROM.
#include "driverlib/rom.h"

#ifndef M_PI
#define M_PI     3.14159265358979323846
#endif

#define SERIES_LENGTH 100 // 100 calulations

float gSeriesData[SERIES_LENGTH]; // Array for floating pt data

int32_t i32DataCount = 0; // Iteration counter

int main(void) {
        float fRadians; // floating pt radians

        ROM_FPULazyStackingEnable();     // Enable lazy stacking
        ROM_FPUEnable();                 // Enable FPU

        // Using 50 MHz clock
        ROM_SysCtlClockSet(
                        SYSCTL_SYSDIV_4 | SYSCTL_USE_PLL | SYSCTL_XTAL_16MHZ
                                    | SYSCTL_OSC_MAIN);

        fRadians = ((2 * M_PI) / SERIES_LENGTH); // Compute radians

        // Calculate 100 values
        while (i32DataCount < SERIES_LENGTH) {
                gSeriesData[i32DataCount] = sinf(fRadians * i32DataCount); // store sine wave dadta
                i32DataCount++; // go to next increment
        }

        while (1)
                ;
}
```
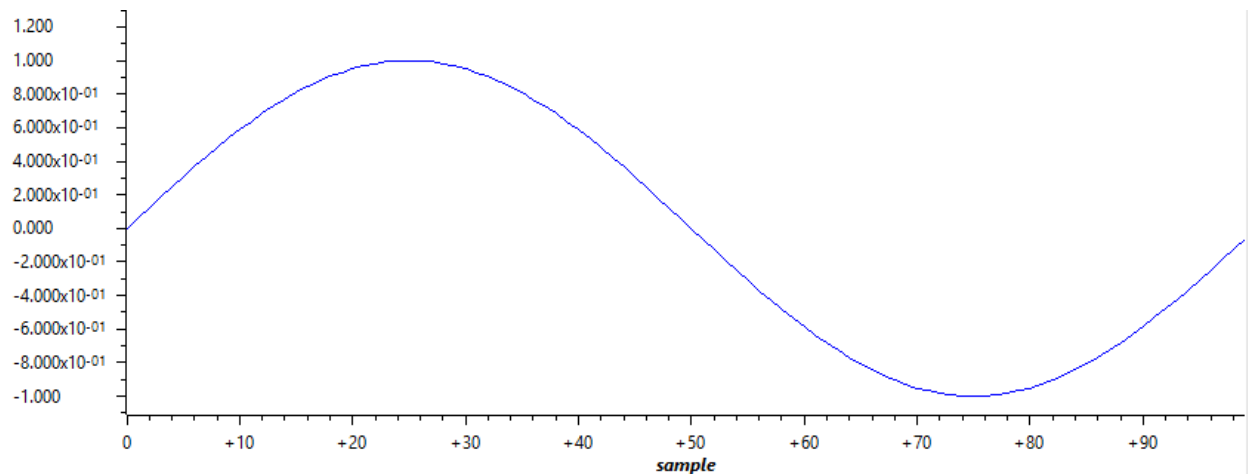
Image of Sine Wave

Task 2:

```c
#include <stdint.h>
#include <stdbool.h>
#include <math.h> // Include math functions
#include "inc/hw_memmap.h"
#include "inc/hw_types.h"
#include "driverlib/fpu.h" // Used for floating point
#include "driverlib/sysctl.h"

#define TARGET_IS_BLIZZARD_RB1   //Used to access API's in ROM.
#include "driverlib/rom.h"

#ifndef M_PI
#define M_PI     3.14159265358979323846
#endif

#define SERIES_LENGTH 1000 // 100 calulations

float gSeriesData[SERIES_LENGTH]; // Array for floating pt data

int32_t i32DataCount = 0; // Iteration counter

int main(void) {
        float fRadians; // floating pt radians

        ROM_FPULazyStackingEnable();     // Enable lazy stacking
        ROM_FPUEnable();                 // Enable FPU

        // Using 50 MHz clock
        ROM_SysCtlClockSet(
                        SYSCTL_SYSDIV_4 | SYSCTL_USE_PLL | SYSCTL_XTAL_16MHZ
                                | SYSCTL_OSC_MAIN);

        fRadians = ((2 * M_PI) / SERIES_LENGTH); // Compute radians

        // Calculate 1000 values
        while (i32DataCount < SERIES_LENGTH) {
                gSeriesData[i32DataCount] = cosf(fRadians * i32DataCount); // store sine wave dadta
                i32DataCount++; // go to next increment
```
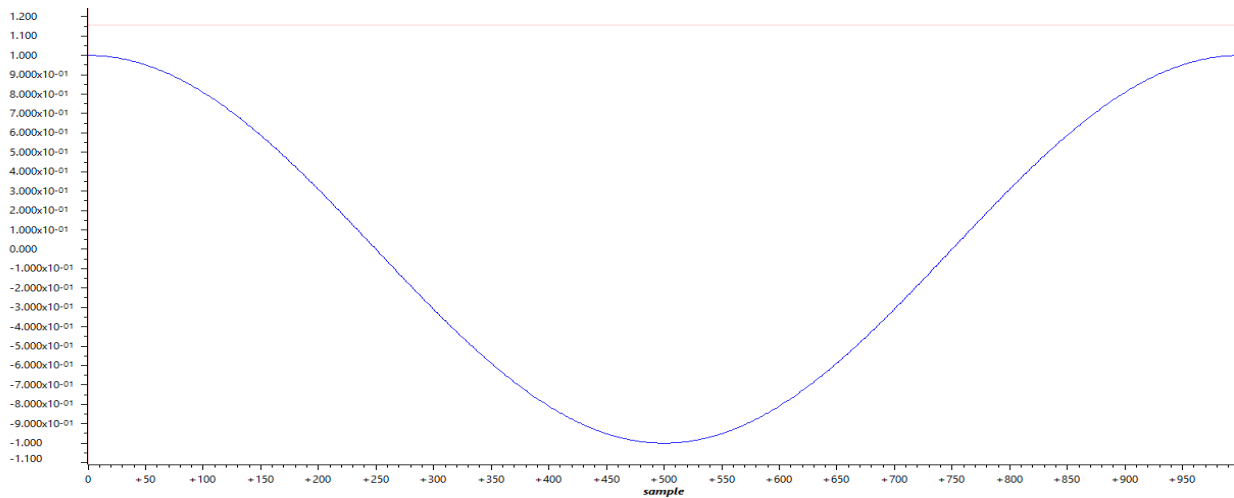
```
    }
    while (1)
        ;
}
```

Image of Cosine Wave

Video Link to Demo

NONE