

Design Assignment 1

DO NOT REMOVE THIS PAGE DURING SUBMISSION:

The student understands that all required components should be submitted in complete for grading of this assignment.

NO	SUBMISSION ITEM	COMPLETED (Y/N)	MARKS (/MAX)
0.	INITIAL CODE OF TASK A		
1.	INCREMENTAL / DIFFERENTIAL CODE OF TASK B		
2.	INCREMENTAL / DIFFERENTIAL CODE OF TASK C		
3.	INCREMENTAL / DIFFERENTIAL CODE OF TASK D		
4	CALCULATION OF EXECUTION TIME @ 16MHZ		
5.	SCREENSHOTS OF EACH TASK OUTPUT		
6.	GITHUB LINK OF THE DA		

0	INITIAL CODE OF TASK 1/A		
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FILE: header.inc

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; Created: 2/19/2016 1:39:33 PM
; Author : jmsikorski
;
.ORG 0x20      ;Place after program code

.MACRO INITSTACK      ;Initialize Stack Pointer
    LDI    R16, HIGH(RAMEND)
    OUT    SPH, R16
    LDI    R16, LOW(RAMEND)
    OUT    SPL, R16
.ENDMACRO

.DEF  TEMP1 = R17      ;R17 is a temp register and its value is not saved
.DEF  COUNT = R18      ;R18 is used for loop counting
.EQU  Var_Address = 0x100;

Div3:                ;Checks if a value is divisible by 3
                    ;Value is stored in TEMP1 register
                    ;Algorithm subtracts odd bits and adds even bits
                    ;If the sum is 0, 3, or -3 then TEMP1 is divisible by 3

    PUSH    R16      ;Save R16 state
    PUSH    R25      ;Save R25 state
    PUSH    R22      ;Save R22 state
    PUSH    COUNT    ;Save Count state
    LDI     R25, 0    ;Clear summing register
    LDI     R22, 0    ;Store 0 value
    LDI     COUNT, 4  ;Loop Counter
    MOV     R16, TEMP1 ;Save TEMP1 value
Repeat3:
    LSL     TEMP1     ;Shift out MSB of TEMP1
    SBC     R25, R22   ;Subtract carry from count
    LSL     TEMP1     ;Shift out MSB of TEMP1
    ADC     R25, R22   ;Add carry to count
    DEC     COUNT     ;Decrement loop counter
    CPI     COUNT, 0   ;Check loop counter
    BRNE    Repeat3    ;Stay in loop
    CPI     R25, 0
    BREQ    Add3       ;If count != 0 don't add
    CPI     R25, 3
    BREQ    Add3       ;If count != 3 don't add
    CPI     R25, -3
    BREQ    Add3       ;If count != -3 don't add
    RJMP    End3
Add3:
    ADD     R23, R16   ;Add the value to R24
    ADC     R24, R22   ;Add the carry if any to R25
End3:
    POP     COUNT     ;Restore Count
    POP     R22       ;Restore R22
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    POP    R25        ;Restore R25
    POP    R16        ;Restore R16
    RET                ;Return to program

Div7:                ;Checks if a value is divisible by 7
                    ;Value is stored in TEMP1 register
                    ;Algorithm divides 8 bits into 3 bit segments,
                    ;segments are summed, if sum = 7 then TEMP1 is
                    ;divisible by 7, if sum > 7, repeat summation
    PUSH   R16        ;Save R16 state
    PUSH   R25        ;Save R25 state
    PUSH   R22        ;Save R22 state
    PUSH   COUNT      ;Save Count state
    LDI    R25, 0      ;Clear summing register1
    LDI    R22, 0      ;Store 0 value
    LDI    COUNT, 3    ;Loop counter
    MOV    R16, TEMP1  ;Save TEMP1 value
Repeat7:
    SBRC   TEMP1, 0    ;Add 1 if bit 0 is 1
    SUBI   R25, -1
    SBRC   TEMP1, 1    ;Add 2 if bit 1 is 1
    SUBI   R25, -2
    SBRC   TEMP1, 2    ;Add 4 if bit 1 is 1
    SUBI   R25, -4
    LSR    TEMP1       ;Shift out 1st 3 bits
    LSR    TEMP1
    LSR    TEMP1
    DEC    COUNT       ;Decrement Counter
    CPI    COUNT, 0    ;Loop until Counter equals 0
    BRNE   Repeat7
    SUBI   R25, 7       ;Subtract 7 from sum register
    BRMI   End7         ;If Sum less than 0, not divisible by 7
    BREQ   Add7         ;If Sum equal 7, divisible by 7
    LDI    COUNT, 3     ;If greater than 0, sum again
    RJMP   Repeat7

Add7:
    ADD    R20, R16     ;Add the value to R20
    ADC    R21, R22     ;Add the carry if any to R21
End7:
    POP    COUNT        ;Restore Count
    POP    R22          ;Restore R22
    POP    R25          ;Restore R25
    POP    R16          ;Restore R16
    RET                ;Return to program

```

FILE: main.asm

```

.INCLUDE "header.inc"      ;Header file contains macros & subroutines
.ORG 0x00                 ;Beginning of code

    INITSTACK              ;Initialize the stack pointer

    LDI    ZL, LOW(Var_Address) ;Load Z with variable address
    LDI    ZH, HIGH(Var_Address)
    LDI    TEMP1, LOW(RAMEND/2) ;Load Temp1 with initial value
    LDI    COUNT, 25        ;Number of values to add
Get25:

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```

ST      Z+, TEMP1          ;Store Temp1 into (Z) then increment Z
SUBI    TEMP1, -4          ;Update Temp1 value
DEC     COUNT              ;Decrement Counter
CPI     COUNT, 0           ;Loop until Counter equals 0
BRNE    Get25

```

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End1:
    RJMP  End1              ;Infinite loop

```

1.	INCREMENTAL / DIFFERENTIAL CODE OF TASK B		
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File main.asm

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.EQU    Num = 25            ;Variable for number of values (Added)
    LDI  COUNT, Num         ;Number of values to add (Changed line 9)

```

GetNum: (Changed line 10)

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    BRNE  GetNum (Changed line15)

```

(Incremental Code at line 16)

```

    LDI  ZL, LOW(Var_Address) ;Load Z with array index[0]
    LDI  ZH, HIGH(Var_Address)
    LDI  COUNT, Num           ;Variable Counter
Divide7:
    LD   TEMP1, Z+            ;Load TEMP1 with the value in (Z) post increment Z
    CALL Div7                 ;Call Div7 Subroutine
    DEC  COUNT                ;Decrement counter
    CPI  COUNT, 0             ;Repeat until Counter equals 0
    BRNE Divide7

```

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End1:
    RJMP  End1              ;Infinte Loop

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2	INCREMENTAL / DIFFERENTIAL CODE OF TASK C		
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File main.asm

(Differential Code at line 22)

```

Divide:
    LD   TEMP1, Z            ;Load TEMP1 with the value in (Z), post increment Z
    CALL Div7                ;Call Div7 Subroutine
    LD   TEMP1, Z+           ;Reload TEMP1
    CALL Div3                ;Call Div3 Subroutine
    DEC  COUNT               ;Decrement Counter
    CPI  COUNT, 0            ;Loop until Counter equals 0
    BRNE Divide

```

```

End1:
    RJMP  End1              ;Infinite Loop

```

3	INCREMENTAL / DIFFERENTIAL CODE OF TASK D		
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File main.asm

(Incremental Code at line 31)

```
LDI    TEMP1, 0
AND    R7, TEMP1           ;Clear R7
CPI    R24, 0              ;Check if R24 has a value (i.e. R23 has overflowed)
BREQ   End1                ;If R23 hasn't overflowed, jump to end
LDI    TEMP1, 8            ;Set bit 3 high
OR     R7, TEMP1
```

End1:
RJMP End1 ;Infinite Loop

4.	CALCULATION OF EXECUTION TIME @ 16MHZ		
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Simulation shows an execution time of 299.38 μ s at 16 Mhz using 4790 clock cycles.

5.	SCREENSHOTS OF EACH TASK OUTPUT		
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TASK A:

Processor Status		Memory		Processor Status		Memory	
Name	Value	Memory:	prog FLASH	Name	Value	Memory:	data IRAM
Program Counter	0x00000004	prog 0x0000	08 00 0e bf 0f ef 0d .à.ì.ì.	Program Counter	0x0000000D	data 0x0100	7f 83 87 8b 8f 93 97 .f...~
Stack Pointer	0x08FF	prog 0x0007	bf 00 00 f1 00 1f e7 2àààa.c	Stack Pointer	0x08FF	data 0x0107	9b 9f a3 a7 ab af b3 .Yeg~.
X Register	0x0000	prog 0x000E	29 e1 11 93 1c 5f 2a 2a .jâ...*	X Register	0x0000	data 0x010E	b7 bb bf c3 c7 cb cf ~z&CEI
Y Register	0x0000	prog 0x0015	95 20 30 d9 f7 ff cf .0ùÿÿÿ	Y Register	0x0000	data 0x0115	d3 d7 db df 00 00 00 00 0x00...
Z Register	0x0000	prog 0x001C	ff ff ff ff ff ff ff yyyyyyy	Z Register	0x0119	data 0x011C	00 00 00 00 00 00 00 00
Status Register	00000000	prog 0x0023	ff ff ff ff ff ff ff yyyyyyy	Status Register	00000000	data 0x0123	00 00 00 00 00 00 00 00
Cycle Counter	3	prog 0x002A	ff ff ff ff ff ff ff yyyyyyy	Cycle Counter	181	data 0x012A	00 00 00 00 00 00 00 00
Frequency	16.000 MHz	prog 0x0031	ff ff ff ff ff ff ff yyyyyyy	Frequency	16.000 MHz	data 0x0131	00 00 00 00 00 00 00 00
Stop Watch	0.19 µs	prog 0x0038	ff ff ff ff ff ff ff yyyyyyy	Stop Watch	11.31 µs	data 0x0138	00 00 00 00 00 00 00 00
Registers		prog 0x003F	ff 0f 93 9f 93 6f 93 y."y"o"	Registers		data 0x013F	00 00 00 00 00 00 00 00
R00	0x00	prog 0x0046	2f 93 90 e0 60 e0 24 /".à"à\$	R00	0x00	data 0x0146	00 00 00 00 00 00 00 00
R01	0x00	prog 0x004D	e0 01 2f 11 0f 96 0b à./.-.	R01	0x00	data 0x014D	00 00 00 00 00 00 00 00
R02	0x00	prog 0x0054	11 0f 96 1f 2a 95 20 .-.*.	R02	0x00	data 0x0154	00 00 00 00 00 00 00 00
R03	0x00	prog 0x005B	30 c9 f7 90 30 29 f0 0E+.0)δ	R03	0x00	data 0x015B	00 00 00 00 00 00 00 00
R04	0x00	prog 0x0062	93 30 19 f0 9d 3f 09 "0.δ.?	R04	0x00	data 0x0162	00 00 00 00 00 00 00 00
R05	0x00	prog 0x0069	f0 02 c0 70 0f 86 1f δ.Ap...	R05	0x00	data 0x0169	00 00 00 00 00 00 00 00
R06	0x00	prog 0x0070	2f 91 6f 91 9f 91 0f /'o'Y'.	R06	0x00	data 0x0170	00 00 00 00 00 00 00 00
R07	0x00	prog 0x0077	91 08 95 0f 93 9f 93 '...'m"	R07	0x00	data 0x0177	00 00 00 00 00 00 00 00
R08	0x00	prog 0x007E	6f 93 2f 93 90 e0 60 o"/".a"	R08	0x00	data 0x017E	00 00 00 00 00 00 00 00
R09	0x00	prog 0x0085	e0 23 e0 01 2f 10 fd aia./y	R09	0x00	data 0x0185	00 00 00 00 00 00 00 00
R10	0x00	prog 0x008C	9f 5f 11 fd 9e 5f 12 Y.-yZ..	R10	0x00	data 0x018C	00 00 00 00 00 00 00 00
R11	0x00	prog 0x0093	fd 9c 5f 16 95 16 95 ym....	R11	0x00	data 0x0193	00 00 00 00 00 00 00 00
R12	0x00	prog 0x009A	16 95 2a 95 20 30 a1 .-.*. 0i	R12	0x00	data 0x019A	00 00 00 00 00 00 00 00
R13	0x00	prog 0x00A1	f7 97 50 2a f0 11 f0 -P*δ.δ	R13	0x00	data 0x01A1	00 00 00 00 00 00 00 00
R14	0x00	prog 0x00A8	23 e0 ef cf 40 0f 56 #aiI@.V	R14	0x00	data 0x01A8	00 00 00 00 00 00 00 00
R15	0x00	prog 0x00AF	1f 2f 91 6f 91 9f 91 /'o'Y'.	R15	0x00	data 0x01AF	00 00 00 00 00 00 00 00
R16	0xFF	prog 0x00B6	0f 91 08 95 ff ff ff '...'y'y	R16	0xFF	data 0x01B6	00 00 00 00 00 00 00 00
R17	0x00	prog 0x00BD	ff ff ff ff ff ff ff yyyyyyy	R17	0xE3	data 0x01BD	00 00 00 00 00 00 00 00
R18	0x00	prog 0x00C4	ff ff ff ff ff ff ff yyyyyyy	R18	0x00	data 0x01C4	00 00 00 00 00 00 00 00
R19	0x00	prog 0x00CB	ff ff ff ff ff ff ff yyyyyyy	R19	0x00	data 0x01CB	00 00 00 00 00 00 00 00
R20	0x00	prog 0x00D2	ff ff ff ff ff ff ff yyyyyyy	R20	0x00	data 0x01D2	00 00 00 00 00 00 00 00
R21	0x00	prog 0x00D9	ff ff ff ff ff ff ff yyyyyyy	R21	0x00	data 0x01D9	00 00 00 00 00 00 00 00
R22	0x00	prog 0x00E0	ff ff ff ff ff ff ff yyyyyyy	R22	0x00	data 0x01E0	00 00 00 00 00 00 00 00
R23	0x00	prog 0x00E7	ff ff ff ff ff ff ff yyyyyyy	R23	0x00	data 0x01E7	00 00 00 00 00 00 00 00
R24	0x00	prog 0x00EE	ff ff ff ff ff ff ff yyyyyyy	R24	0x00	data 0x01EE	00 00 00 00 00 00 00 00
R25	0x00	prog 0x00F5	ff ff ff ff ff ff ff yyyyyyy	R25	0x00	data 0x01F5	00 00 00 00 00 00 00 00
R26	0x00	prog 0x00FC	ff ff ff ff ff ff ff yyyyyyy	R26	0x00	data 0x01FC	00 00 00 00 00 00 00 00
R27	0x00	prog 0x0103	ff ff ff ff ff ff ff yyyyyyy	R27	0x00	data 0x0203	00 00 00 00 00 00 00 00
R28	0x00	prog 0x010A	ff ff ff ff ff ff ff yyyyyyy	R28	0x00	data 0x020A	00 00 00 00 00 00 00 00
R29	0x00	prog 0x0111	ff ff ff ff ff ff ff yyyyyyy	R29	0x00	data 0x0211	00 00 00 00 00 00 00 00
R30	0x00	prog 0x0118	ff ff ff ff ff ff ff yyyyyyy	R30	0x19	data 0x0218	00 00 00 00 00 00 00 00
R31	0x00	prog 0x011F	ff ff ff ff ff ff ff yyyyyyy	R31	0x01	data 0x021F	00 00 00 00 00 00 00 00
		prog 0x0126	ff ff ff ff ff ff ff yyyyyyy			data 0x0226	00 00 00 00 00 00 00 00
		prog 0x012D	ff ff ff ff ff ff ff yyyyyyy			data 0x022D	00 00 00 00 00 00 00 00
		prog 0x0134	ff ff ff ff ff ff ff yyyyyyy			data 0x0234	00 00 00 00 00 00 00 00
		prog 0x013B	ff ff ff ff ff ff ff yyyyyyy			data 0x023B	00 00 00 00 00 00 00 00
		prog 0x0142	ff ff ff ff ff ff ff yyyyyyy			data 0x0242	00 00 00 00 00 00 00 00
		prog 0x0149	ff ff ff ff ff ff ff yyyyyyy			data 0x0249	00 00 00 00 00 00 00 00
		prog 0x0150	ff ff ff ff ff ff ff yyyyyyy			data 0x0250	00 00 00 00 00 00 00 00
		prog 0x0157	ff ff ff ff ff ff ff yyyyyyy			data 0x0257	00 00 00 00 00 00 00 00
		prog 0x015E	ff ff ff ff ff ff ff yyyyyyy			data 0x025E	00 00 00 00 00 00 00 00
		prog 0x0165	ff ff ff ff ff ff ff yyyyyyy			data 0x0265	00 00 00 00 00 00 00 00
		prog 0x016C	ff ff ff ff ff ff ff yyyyyyy			data 0x026C	00 00 00 00 00 00 00 00
		prog 0x0173	ff ff ff ff ff ff ff yyyyyyy			data 0x0273	00 00 00 00 00 00 00 00
		prog 0x017A	ff ff ff ff ff ff ff yyyyyyy			data 0x027A	00 00 00 00 00 00 00 00
		prog 0x0181	ff ff ff ff ff ff ff yyyyyyy			data 0x0281	00 00 00 00 00 00 00 00
		prog 0x0188	ff ff ff ff ff ff ff yyyyyyy			data 0x0288	00 00 00 00 00 00 00 00
		prog 0x018F	ff ff ff ff ff ff ff yyyyyyy			data 0x028F	00 00 00 00 00 00 00 00
		prog 0x0196	ff ff ff ff ff ff ff yyyyyyy			data 0x0296	00 00 00 00 00 00 00 00
						data 0x029D	00 00 00 00 00 00 00 00

TASK B:

Processor Status		Memory 4		Processor Status		Memory 4	
Name	Value	Memory: prog FLASH		Name	Value	Memory: data IRAM	
Program Counter	0x00000004	prog 0x0000 08 e0 0e bf 0f ef 0d .à.¿.1.		Program Counter	0x00000016	data 0x0100 7f 83 87 8b 8f 93 97 .f..."	
Stack Pointer	0x08FF	prog 0x0007 bf e0 e0 f1 e0 1f e7 ¿aãñ.ç		Stack Pointer	0x08FF	data 0x0107 9b 9f a3 a7 ab af b3 .Y5#"	
X Register	0x0000	prog 0x000E 29 e1 11 93 1c 5f 2a ¿ä."._"		X Register	0x0000	data 0x010E b7 bb bf c3 c7 cb cf .¿ACEI	
Y Register	0x0000	prog 0x0015 95 20 30 d9 f7 e0 e0 . 00÷aa		Y Register	0x0000	data 0x0115 d3 d7 db df 00 00 00 0x00...	
Z Register	0x0000	prog 0x001C f1 e0 29 e1 11 91 0e ñà¿a.¿		Z Register	0x0119	data 0x011C 00 00 00 00 00 00 00	
Status Register	00000000	prog 0x0023 94 ad 00 2a 95 20 30 "M." 0		Status Register	00000000	data 0x0123 00 00 00 00 00 00 00	
Cycle Counter	3	prog 0x002A d1 f7 ff cf ff ff ff ñ÷ÿÿÿÿ		Cycle Counter	3079	data 0x012A 00 00 00 00 00 00 00	
Frequency	16.000 MHz	prog 0x0031 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		Frequency	16.000 MHz	data 0x0131 00 00 00 00 00 00 00	
Stop Watch	0.19 µs	prog 0x0038 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		Stop Watch	192.44 µs	data 0x0138 00 00 00 00 00 00 00	
Registers		prog 0x003F ff ff ff ff ff ff ff ÿÿÿÿÿÿ		Registers		data 0x013F 00 00 00 00 00 00 00	
R00	0x00	prog 0x0046 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R00	0x00	data 0x0146 00 00 00 00 00 00 00	
R01	0x00	prog 0x004D ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R01	0x00	data 0x014D 00 00 00 00 00 00 00	
R02	0x00	prog 0x0054 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R02	0x00	data 0x0154 00 00 00 00 00 00 00	
R03	0x00	prog 0x0058 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R03	0x00	data 0x015B 00 00 00 00 00 00 00	
R04	0x00	prog 0x0062 9f 93 6f 93 2f 93 90 Y"o"/"		R04	0x00	data 0x0162 00 00 00 00 00 00 00	
R05	0x00	prog 0x0069 e0 60 e0 24 e0 01 2f à`a\$a./		R05	0x00	data 0x0169 00 00 00 00 00 00 00	
R06	0x00	prog 0x0070 11 0f 96 0b 11 0f 96 .-.-.-		R06	0x00	data 0x0170 00 00 00 00 00 00 00	
R07	0x00	prog 0x0077 1f 2a 95 20 30 c9 f7 .- .0é+		R07	0x00	data 0x0177 00 00 00 00 00 00 00	
R08	0x00	prog 0x007E 90 30 29 f0 93 30 19 .0¿0_0		R08	0x00	data 0x017E 00 00 00 00 00 00 00	
R09	0x00	prog 0x0085 f0 9d 3f 09 f0 02 c0 0.¿.0.À		R09	0x00	data 0x0185 00 00 00 00 00 00 00	
R10	0x00	prog 0x008C 80 0f 76 1f 2f 91 6f €.v./'o		R10	0x00	data 0x018C 00 00 00 00 00 00 00	
R11	0x00	prog 0x0093 91 9f 01 0f 91 08 95 'Y.'..		R11	0x00	data 0x0193 00 00 00 00 00 00 00	
R12	0x00	prog 0x009A 0f 93 9f 93 6f 93 2f ."Y"o"/		R12	0x00	data 0x019A 00 00 00 00 00 00 00	
R13	0x00	prog 0x00A1 93 90 e0 60 e0 23 e0 ".`à`a#`a		R13	0x00	data 0x01A1 00 00 00 00 00 00 00	
R14	0x00	prog 0x00A8 01 2f 10 fd 9f 5f 11 ././_Y_.		R14	0x00	data 0x01A8 00 00 00 00 00 00 00	
R15	0x00	prog 0x00AF fd 9e 5f 12 fd 9c 5f y2_._0_		R15	0x00	data 0x01AF 00 00 00 00 00 00 00	
R16	0xFF	prog 0x00B6 16 95 16 95 16 95 2a*		R16	0xFF	data 0x01B6 00 00 00 00 00 00 00	
R17	0x00	prog 0x00BD 95 20 30 a1 f7 97 50 . 01÷-P		R17	0x00	data 0x01BD 00 00 00 00 00 00 00	
R18	0x00	prog 0x00C4 2a f0 11 f0 23 e0 ef *0.0#ã1		R18	0x00	data 0x01C4 00 00 00 00 00 00 00	
R19	0x00	prog 0x00CB cf 40 0f 56 1f 2f 91 T0.V./'		R19	0x00	data 0x01CB 00 00 00 00 00 00 00	
R20	0x00	prog 0x00D2 6f 91 9f 91 0f 91 08 o"Y.'.		R20	0x0D	data 0x01D2 00 00 00 00 00 00 00	
R21	0x00	prog 0x00D9 95 ff ff ff ff ff ff .ÿÿÿÿÿÿ		R21	0x02	data 0x01D9 00 00 00 00 00 00 00	
R22	0x00	prog 0x00E0 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R22	0x00	data 0x01E0 00 00 00 00 00 00 00	
R23	0x00	prog 0x00E7 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R23	0x00	data 0x01E7 00 00 00 00 00 00 00	
R24	0x00	prog 0x00EE ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R24	0x00	data 0x01EE 00 00 00 00 00 00 00	
R25	0x00	prog 0x00F5 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R25	0x00	data 0x01F5 00 00 00 00 00 00 00	
R26	0x00	prog 0x00FC ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R26	0x00	data 0x01FC 00 00 00 00 00 00 00	
R27	0x00	prog 0x0103 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R27	0x00	data 0x0203 00 00 00 00 00 00 00	
R28	0x00	prog 0x010A ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R28	0x00	data 0x020A 00 00 00 00 00 00 00	
R29	0x00	prog 0x0111 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R29	0x00	data 0x0211 00 00 00 00 00 00 00	
R30	0x00	prog 0x0118 ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R30	0x19	data 0x0218 00 00 00 00 00 00 00	
R31	0x00	prog 0x011F ff ff ff ff ff ff ff ÿÿÿÿÿÿ		R31	0x01	data 0x021F 00 00 00 00 00 00 00	
		prog 0x0126 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0226 00 00 00 00 00 00 00	
		prog 0x012D ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x022D 00 00 00 00 00 00 00	
		prog 0x0134 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0234 00 00 00 00 00 00 00	
		prog 0x013B ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x023B 00 00 00 00 00 00 00	
		prog 0x0142 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0242 00 00 00 00 00 00 00	
		prog 0x0149 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0249 00 00 00 00 00 00 00	
		prog 0x0158 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0250 00 00 00 00 00 00 00	
		prog 0x0157 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0257 00 00 00 00 00 00 00	
		prog 0x015E ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x025E 00 00 00 00 00 00 00	
		prog 0x0165 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0265 00 00 00 00 00 00 00	
		prog 0x016C ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x026C 00 00 00 00 00 00 00	
		prog 0x0173 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0273 00 00 00 00 00 00 00	
		prog 0x017A ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x027A 00 00 00 00 00 00 00	
		prog 0x0181 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0281 00 00 00 00 00 00 00	
		prog 0x0188 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0288 00 00 00 00 00 00 00	
		prog 0x018F ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x028F 00 00 00 00 00 00 00	
		prog 0x0196 ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x0296 00 00 00 00 00 00 00	
		prog 0x019D ff ff ff ff ff ff ff ÿÿÿÿÿÿ				data 0x029D 00 00 00 00 00 00 00	

TASK C:

Processor Status	Value	Memory	prog FLASH	Processor Status	Value	Memory	data IRAM
Program Counter	0x00000004	prog 0x0000	08 e0 0e bf 0f ef 0d	Program Counter	0x00000019	data 0x0100	7f 83 87 8b 8f 93 97
Stack Pointer	0x08FF	prog 0x0007	bf e0 e0 f1 e0 1f e7	Stack Pointer	0x08FF	data 0x0107	9b 9f a3 a7 ab af b3
X Register	0x0000	prog 0x000E	29 e1 11 93 1c 5f 2a	X Register	0x0000	data 0x010E	b7 bb bf c3 c7 cb cf
Y Register	0x0000	prog 0x0015	95 20 30 d9 f7 e0 e0	Y Register	0x0000	data 0x0115	d3 d7 db df 00 00 00
Z Register	0x0000	prog 0x001C	f1 e0 29 e1 10 81 0e	Z Register	0x0119	data 0x011C	00 00 00 00 00 00 00
Status Register	00000000	prog 0x0023	94 6d 00 11 91 0e 94	Status Register	00000000	data 0x0123	00 00 00 00 00 00 00
Cycle Counter	3	prog 0x002A	50 00 2a 95 20 30 b9	Cycle Counter	4784	data 0x012A	00 00 00 00 00 00 00
Frequency	16.000 MHz	prog 0x0031	f7 ff cf ff ff ff ff	Frequency	16.000 MHz	data 0x0131	00 00 00 00 00 00 00
Stop Watch	0.19 µs	prog 0x0038	ff ff ff ff ff ff ff	Stop Watch	299.00 µs	data 0x0138	00 00 00 00 00 00 00
Registers		prog 0x003F	ff ff ff ff ff ff ff	Registers		data 0x013F	00 00 00 00 00 00 00
R00	0x00	prog 0x0046	ff ff ff ff ff ff ff	R00	0x00	data 0x0146	00 00 00 00 00 00 00
R01	0x00	prog 0x004D	ff ff ff ff ff ff ff	R01	0x00	data 0x014D	00 00 00 00 00 00 00
R02	0x00	prog 0x0054	ff ff ff ff ff ff ff	R02	0x00	data 0x0154	00 00 00 00 00 00 00
R03	0x00	prog 0x005B	ff ff ff ff ff ff ff	R03	0x00	data 0x015B	00 00 00 00 00 00 00
R04	0x00	prog 0x0062	ff ff ff ff ff ff ff	R04	0x00	data 0x0162	00 00 00 00 00 00 00
R05	0x00	prog 0x0069	ff ff ff ff ff ff ff	R05	0x00	data 0x0169	00 00 00 00 00 00 00
R06	0x00	prog 0x0070	ff ff ff ff ff ff ff	R06	0x00	data 0x0170	00 00 00 00 00 00 00
R07	0x00	prog 0x0077	ff ff ff ff ff ff ff	R07	0x00	data 0x0177	00 00 00 00 00 00 00
R08	0x00	prog 0x007E	ff ff ff ff ff ff ff	R08	0x00	data 0x017E	00 00 00 00 00 00 00
R09	0x00	prog 0x0085	ff ff ff ff ff ff ff	R09	0x00	data 0x0185	00 00 00 00 00 00 00
R10	0x00	prog 0x008C	ff ff ff ff ff ff ff	R10	0x00	data 0x018C	00 00 00 00 00 00 00
R11	0x00	prog 0x0093	ff ff ff ff ff ff ff	R11	0x00	data 0x0193	00 00 00 00 00 00 00
R12	0x00	prog 0x009A	ff ff ff ff ff ff ff	R12	0x00	data 0x019A	00 00 00 00 00 00 00
R13	0x00	prog 0x00A1	93 9f 93 6f 93 2f 93	R13	0x00	data 0x01A1	00 00 00 00 00 00 00
R14	0x00	prog 0x00A8	90 e0 60 e0 24 e0 01	R14	0x00	data 0x01A8	00 00 00 00 00 00 00
R15	0x00	prog 0x00AF	2f 11 0f 9b 00 11 0f	R15	0x00	data 0x01AF	00 00 00 00 00 00 00
R16	0xFF	prog 0x00B6	96 1f 2a 95 20 30 c9	R16	0xFF	data 0x01B6	00 00 00 00 00 00 00
R17	0x00	prog 0x00BD	f7 90 30 29 f0 93 30	R17	0x00	data 0x01BD	00 00 00 00 00 00 00
R18	0x00	prog 0x00C4	19 f0 9d 3f 09 f0 02	R18	0x00	data 0x01C4	00 00 00 00 00 00 00
R19	0x00	prog 0x00CB	e0 80 0f 76 1f 2f 91	R19	0x00	data 0x01CB	00 00 00 00 00 00 00
R20	0x00	prog 0x00D2	6f 91 9f 91 0f 91 08	R20	0x00	data 0x01D2	00 00 00 00 00 00 00
R21	0x00	prog 0x00D9	95 0f 93 9f 93 6f 93	R21	0x00	data 0x01D9	00 00 00 00 00 00 00
R22	0x00	prog 0x00E0	2f 93 90 e0 60 e0 23	R22	0x00	data 0x01E0	00 00 00 00 00 00 00
R23	0x00	prog 0x00E7	e0 01 2f 10 fd 9f 5f	R23	0x00	data 0x01E7	00 00 00 00 00 00 00
R24	0x00	prog 0x00EE	11 fd 9e 5f 12 fd 9c	R24	0x00	data 0x01EE	00 00 00 00 00 00 00
R25	0x00	prog 0x00F5	5f 16 95 16 95 16 95	R25	0x00	data 0x01F5	00 00 00 00 00 00 00
R26	0x00	prog 0x00FC	2a 95 20 30 a1 f7 97	R26	0x00	data 0x01FC	00 00 00 00 00 00 00
R27	0x00	prog 0x0103	50 2a f0 11 f0 23 e0	R27	0x00	data 0x0203	00 00 00 00 00 00 00
R28	0x00	prog 0x010A	ef cf 40 0f 56 1f 2f	R28	0x00	data 0x020A	00 00 00 00 00 00 00
R29	0x00	prog 0x0111	91 6f 91 9f 91 0f 91	R29	0x00	data 0x0211	00 00 00 00 00 00 00
R30	0x00	prog 0x0118	08 95 ff ff ff ff ff	R30	0x00	data 0x0218	00 00 00 00 00 00 00
R31	0x00	prog 0x011F	ff ff ff ff ff ff ff	R31	0x00	data 0x021F	00 00 00 00 00 00 00
		prog 0x0126	ff ff ff ff ff ff ff			data 0x0226	00 00 00 00 00 00 00
		prog 0x012D	ff ff ff ff ff ff ff			data 0x022D	00 00 00 00 00 00 00
		prog 0x0134	ff ff ff ff ff ff ff			data 0x0234	00 00 00 00 00 00 00
		prog 0x013B	ff ff ff ff ff ff ff			data 0x023B	00 00 00 00 00 00 00
		prog 0x0142	ff ff ff ff ff ff ff			data 0x0242	00 00 00 00 00 00 00
		prog 0x0149	ff ff ff ff ff ff ff			data 0x0249	00 00 00 00 00 00 00
		prog 0x0150	ff ff ff ff ff ff ff			data 0x0250	00 00 00 00 00 00 00
		prog 0x0157	ff ff ff ff ff ff ff			data 0x0257	00 00 00 00 00 00 00
		prog 0x015E	ff ff ff ff ff ff ff			data 0x025E	00 00 00 00 00 00 00
		prog 0x0165	ff ff ff ff ff ff ff			data 0x0265	00 00 00 00 00 00 00
		prog 0x016C	ff ff ff ff ff ff ff			data 0x026C	00 00 00 00 00 00 00
		prog 0x0173	ff ff ff ff ff ff ff			data 0x0273	00 00 00 00 00 00 00
		prog 0x017A	ff ff ff ff ff ff ff			data 0x027A	00 00 00 00 00 00 00
		prog 0x0181	ff ff ff ff ff ff ff			data 0x0281	00 00 00 00 00 00 00
		prog 0x0188	ff ff ff ff ff ff ff			data 0x0288	00 00 00 00 00 00 00
		prog 0x018F	ff ff ff ff ff ff ff			data 0x028F	00 00 00 00 00 00 00
		prog 0x0196	ff ff ff ff ff ff ff			data 0x0296	00 00 00 00 00 00 00
		prog 0x019D	ff ff ff ff ff ff ff			data 0x029D	00 00 00 00 00 00 00

TASK D:

Processor Status	Value	Memory	prog FLASH	Processor Status	Value	Memory	prog FLASH
Program Counter	0x00000004	prog 0x0000	08 e0 0e bf 0f ef 0d .à.¿.¿.	Program Counter	0x0000001F	prog 0x0000	08 e0 0e bf 0f ef 0d .à.¿.¿.
Stack Pointer	0x08FF	prog 0x0007	bf e0 e0 f1 e0 1f e7 àààà.¿	Stack Pointer	0x08FF	prog 0x0007	bf e0 e0 f1 e0 1f e7 àààà.¿
X Register	0x0000	prog 0x000E	29 e1 11 93 1c 5f 2a)à.¿.¿.	X Register	0x0000	prog 0x000E	29 e1 11 93 1c 5f 2a)à.¿.¿.
Y Register	0x0000	prog 0x0015	95 20 30 d9 f7 e0 e0 .0Ù+àà	Y Register	0x0000	prog 0x0015	95 20 30 d9 f7 e0 e0 .0Ù+àà
Z Register	0x0000	prog 0x001C	f1 e0 29 e1 10 81 0e àà)à...)	Z Register	0x0119	prog 0x001C	f1 e0 29 e1 10 81 0e àà)à...)
Status Register	00000000	prog 0x0023	94 6d 00 11 91 0e 94 "m.¿.¿.	Status Register	00000000	prog 0x0023	94 6d 00 11 91 0e 94 "m.¿.¿.
Cycle Counter	3	prog 0x002A	50 00 2a 95 20 30 b9 P.¿.¿.	Cycle Counter	4790	prog 0x002A	50 00 2a 95 20 30 b9 P.¿.¿.
Frequency	16.000 MHz	prog 0x0031	f7 10 e0 71 22 80 30 +.àà"00	Frequency	16.000 MHz	prog 0x0031	f7 10 e0 71 22 80 30 +.àà"00
Stop Watch	0.19 µs	prog 0x0038	11 f0 10 e0 71 2a ff .0.àq"9	Stop Watch	299.38 µs	prog 0x0038	11 f0 10 e0 71 2a ff .0.àq"9
Registers		prog 0x003F	cf ff ff ff ff ff ff 1yyyyyy	Registers		prog 0x003F	cf ff ff ff ff ff ff 1yyyyyy
R00	0x00	prog 0x0046	ff ff ff ff ff ff ff yyyyyyy	R00	0x00	prog 0x0046	ff ff ff ff ff ff ff yyyyyyy
R01	0x00	prog 0x004D	ff ff ff ff ff ff ff yyyyyyy	R01	0x00	prog 0x004D	ff ff ff ff ff ff ff yyyyyyy
R02	0x00	prog 0x0054	ff ff ff ff ff ff ff yyyyyyy	R02	0x00	prog 0x0054	ff ff ff ff ff ff ff yyyyyyy
R03	0x00	prog 0x005B	ff ff ff ff ff ff ff yyyyyyy	R03	0x00	prog 0x005B	ff ff ff ff ff ff ff yyyyyyy
R04	0x00	prog 0x0062	ff ff ff ff ff ff ff yyyyyyy	R04	0x00	prog 0x0062	ff ff ff ff ff ff ff yyyyyyy
R05	0x00	prog 0x0069	ff ff ff ff ff ff ff yyyyyyy	R05	0x00	prog 0x0069	ff ff ff ff ff ff ff yyyyyyy
R06	0x00	prog 0x0070	ff ff ff ff ff ff ff yyyyyyy	R06	0x00	prog 0x0070	ff ff ff ff ff ff ff yyyyyyy
R07	0x00	prog 0x0077	ff ff ff ff ff ff ff yyyyyyy	R07	0x08	prog 0x0077	ff ff ff ff ff ff ff yyyyyyy
R08	0x00	prog 0x007E	ff ff ff ff ff ff ff yyyyyyy	R08	0x00	prog 0x007E	ff ff ff ff ff ff ff yyyyyyy
R09	0x00	prog 0x0085	ff ff ff ff ff ff ff yyyyyyy	R09	0x00	prog 0x0085	ff ff ff ff ff ff ff yyyyyyy
R10	0x00	prog 0x008C	ff ff ff ff ff ff ff yyyyyyy	R10	0x00	prog 0x008C	ff ff ff ff ff ff ff yyyyyyy
R11	0x00	prog 0x0093	ff ff ff ff ff ff ff yyyyyyy	R11	0x00	prog 0x0093	ff ff ff ff ff ff ff yyyyyyy
R12	0x00	prog 0x009A	ff ff ff ff ff ff ff yyyyyyy	R12	0x00	prog 0x009A	ff ff ff ff ff ff ff yyyyyyy
R13	0x00	prog 0x00A1	93 9f 93 6f 93 2f 93 "Y"o"/"	R13	0x00	prog 0x00A1	93 9f 93 6f 93 2f 93 "Y"o"/"
R14	0x00	prog 0x00A8	90 e0 60 e0 24 e0 01 .à.à\$à.	R14	0x00	prog 0x00A8	90 e0 60 e0 24 e0 01 .à.à\$à.
R15	0x00	prog 0x00AF	2f 11 0f 96 0b 11 0f /.-.-.-.	R15	0x00	prog 0x00AF	2f 11 0f 96 0b 11 0f /.-.-.-.
R16	0xFF	prog 0x00B6	96 1f 2a 95 20 30 c9 -.¿.¿.0E	R16	0xFF	prog 0x00B6	96 1f 2a 95 20 30 c9 -.¿.¿.0E
R17	0x00	prog 0x00BD	f7 90 30 29 f0 93 30 +.0)0"0	R17	0x08	prog 0x00BD	f7 90 30 29 f0 93 30 +.0)0"0
R18	0x00	prog 0x00C4	19 f0 9d 3f 09 f0 02 .0.¿.¿.	R18	0x00	prog 0x00C4	19 f0 9d 3f 09 f0 02 .0.¿.¿.
R19	0x00	prog 0x00CB	e0 80 0f 76 1f 2f 91 àé.v./"	R19	0x00	prog 0x00CB	e0 80 0f 76 1f 2f 91 àé.v./"
R20	0x00	prog 0x00D2	6f 91 9f 01 0f 01 08 o"Y".¿.	R20	0x00	prog 0x00D2	6f 91 9f 01 0f 01 08 o"Y".¿.
R21	0x00	prog 0x00D9	95 0f 93 9f 93 6f 93 .-"Y"o"/"	R21	0x02	prog 0x00D9	95 0f 93 9f 93 6f 93 .-"Y"o"/"
R22	0x00	prog 0x00E0	2f 93 90 e0 60 e0 23 /".à.à#	R22	0x00	prog 0x00E0	2f 93 90 e0 60 e0 23 /".à.à#
R23	0x00	prog 0x00E7	e0 01 2f 10 fd 9f 5f à./."Y_	R23	0x05	prog 0x00E7	e0 01 2f 10 fd 9f 5f à./."Y_
R24	0x00	prog 0x00EE	11 fd 9e 5f 12 fd 9c .y¿._y#	R24	0x88	prog 0x00EE	11 fd 9e 5f 12 fd 9c .y¿._y#
R25	0x00	prog 0x00F5	5f 16 95 16 95 16 95)	R25	0x00	prog 0x00F5	5f 16 95 16 95 16 95)
R26	0x00	prog 0x00FC	2a 95 20 30 a1 f7 97 ".0)=-	R26	0x00	prog 0x00FC	2a 95 20 30 a1 f7 97 ".0)=-
R27	0x00	prog 0x0103	50 2a f0 11 f0 23 e0 P"0.0àà	R27	0x00	prog 0x0103	50 2a f0 11 f0 23 e0 P"0.0àà
R28	0x00	prog 0x010A	ef cf 40 0f 56 1f 2f 1l0.v./	R28	0x00	prog 0x010A	ef cf 40 0f 56 1f 2f 1l0.v./
R29	0x00	prog 0x0111	91 6f 91 9f 01 0f 91 "o"Y".¿.	R29	0x00	prog 0x0111	91 6f 91 9f 01 0f 91 "o"Y".¿.
R30	0x00	prog 0x0118	08 95 ff ff ff ff ff ..yyyyy	R30	0x19	prog 0x0118	08 95 ff ff ff ff ff ..yyyyy
R31	0x00	prog 0x011F	ff ff ff ff ff ff ff yyyyyyy	R31	0x01	prog 0x011F	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0126	ff ff ff ff ff ff ff yyyyyyy			prog 0x0126	ff ff ff ff ff ff ff yyyyyyy
		prog 0x012D	ff ff ff ff ff ff ff yyyyyyy			prog 0x012D	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0134	ff ff ff ff ff ff ff yyyyyyy			prog 0x0134	ff ff ff ff ff ff ff yyyyyyy
		prog 0x013B	ff ff ff ff ff ff ff yyyyyyy			prog 0x013B	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0142	ff ff ff ff ff ff ff yyyyyyy			prog 0x0142	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0149	ff ff ff ff ff ff ff yyyyyyy			prog 0x0149	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0150	ff ff ff ff ff ff ff yyyyyyy			prog 0x0150	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0157	ff ff ff ff ff ff ff yyyyyyy			prog 0x0157	ff ff ff ff ff ff ff yyyyyyy
		prog 0x015E	ff ff ff ff ff ff ff yyyyyyy			prog 0x015E	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0165	ff ff ff ff ff ff ff yyyyyyy			prog 0x0165	ff ff ff ff ff ff ff yyyyyyy
		prog 0x016C	ff ff ff ff ff ff ff yyyyyyy			prog 0x016C	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0173	ff ff ff ff ff ff ff yyyyyyy			prog 0x0173	ff ff ff ff ff ff ff yyyyyyy
		prog 0x017A	ff ff ff ff ff ff ff yyyyyyy			prog 0x017A	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0181	ff ff ff ff ff ff ff yyyyyyy			prog 0x0181	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0188	ff ff ff ff ff ff ff yyyyyyy			prog 0x0188	ff ff ff ff ff ff ff yyyyyyy
		prog 0x018F	ff ff ff ff ff ff ff yyyyyyy			prog 0x018F	ff ff ff ff ff ff ff yyyyyyy
		prog 0x0196	ff ff ff ff ff ff ff yyyyyyy			prog 0x0196	ff ff ff ff ff ff ff yyyyyyy
		prog 0x019D	ff ff ff ff ff ff ff yyyyyyy			prog 0x019D	ff ff ff ff ff ff ff yyyyyyy

6.	GITHUB LINK OF THE DA		
https://github.com/jmsikorski/UNLVCPe301Sp16/tree/master/DA1			

Student Academic Misconduct Policy

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JASON M. SIKORSKI