CPE301 – SPRING 2019

Design Assignment 1B

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Primary Github address: https://github.com/MohamedJundi1994/Submission\_DA.git

Directory: Documents\School\CPE 301\Repository\CPE\_301\ESD301DA\DA1B

1. **COMPONENTS LIST AND CONNECTION BLOCK DIAGRAM w/ PINS**

NONE

1. **INITIAL/MODIFIED/DEVELOPED CODE OF TASK 1/A**

My Code:

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; DA1B.asm

;

; Created: 2/22/2019 5:04:23 PM

; Author : Mohamed Jundi

;

.ORG 0

LDI XL, low(0x0200) // Load low bits of memory location 0x200 into XL

LDI XH, high(0x200) // Load high bits of memory location 0x200 into XH

LDI YL, low(0x400) // Load low bits of memory location 0x400 into YL

LDI YH, high(0x400) // Load high bits of memory location 0x400 into YH

LDI ZL, low(0x600) // Load low bits of memory location 0x600 into ZL

LDI ZH, high(0x600) // Load high bits of memory location 0x600 into ZH

// Start

LDI R20, 34 // Load value 34 into R20, used as start number > 10

LDI R22, 0 // Load 0 into R22, used for carry addition

loopx: // Loop to store values into X and begin check

ST X+, R20 // Store values of R20 into X register, and then increment

MOV R21, R20 // Move value of R20 into R21, used for division

div3: // Loop to check if divisible by 3

CPI R21, 3 // Compare if value R21 with 3

BRLT less // Branch to less if R21 is less than 3

SUBI R21, 3 // Subtract 3 from value of R21

CPI R21, 3 // Compare if value R21 with 3

BREQ equal // Branch to equal if equal to 3

BRNE div3 // Branch to div3 for repetition otherwise

less: // less is used to store values into Z register, used for not divisible numbers

ST Z+, R20 // Store value of R20 into Z register

ADD R19, R20 // Add value of R20 to R19 and store.

ADC R18, R22 // Add in the carry as well

rjmp skip // Jump to skip when complete to avoid next loop

equal: // equal is to store values into Y register, used for divisible numbers

ST Y+, R20 // Store value of R20 into Y register

ADD R17, R20 // Add value of R20 to R17 and store.

ADC R16, R22 // Add in the carry as well

skip: // skip is used at end of program for incrementation branching

INC R20 // Used to increment R20 value

CPI R20, 133 // Compare R20 value to 133

BRNE loopx // branch to loopx if R20 value is not 133

BREAK // Stop program when value of R20 is 133

1. **DEVELOPED MODIFIED CODE OF TASK 2/A from TASK 1/A**

No modifications, just developed code.

1. **SCHEMATICS**

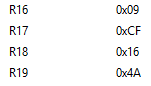
NONE

1. **SCREENSHOTS OF EACH TASK OUTPUT (ATMEL STUDIO OUTPUT)**

**Different Examples:**

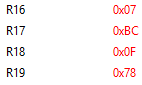
Example 1: Using 99 numbers from **34 to 133**

Result:



Example 2: Using 99 numbers from **11 to 110**

Result:



1. **SCREENSHOT OF EACH DEMO (BOARD SETUP)**

NONE

1. **VIDEO LINKS OF EACH DEMO**

NONE

1. **GITHUB LINK OF THIS DA**

Link: https://github.com/MohamedJundi1994/Submission\_DA.git

This assignment submission is my own, original work.

MOHAMAD JUNDI