

# Nirbhay Sharma (B19CSE114)

## DSL - Lab - 8

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### Que-1

```
#include "stm32f4xx.h"
main(void)
{
    int x,y;
    x=0x1B;
    RCC->AHB1ENR |=1; // Enables Clock

    if (x >= 0 && x < 100) {
        GPIOB->MODER = 0X15555;
        GPIOB->ODR = 0X000;
        y = 2 * x + 2;
        GPIOB->ODR = y;
    }

    if (x >= 100 && x < 200){
        GPIOC->MODER = 0X55555555;
        GPIOC->ODR = 0X0000;
        y = x * x - 2 * x;
        GPIOC->ODR = y;
    }

    if (x >= 200 && x < 256){
        GPIOD->MODER = 0X5555;
        GPIOD->ODR = 0X00;
        y = x - 150;
        GPIOD->ODR = y;
    }

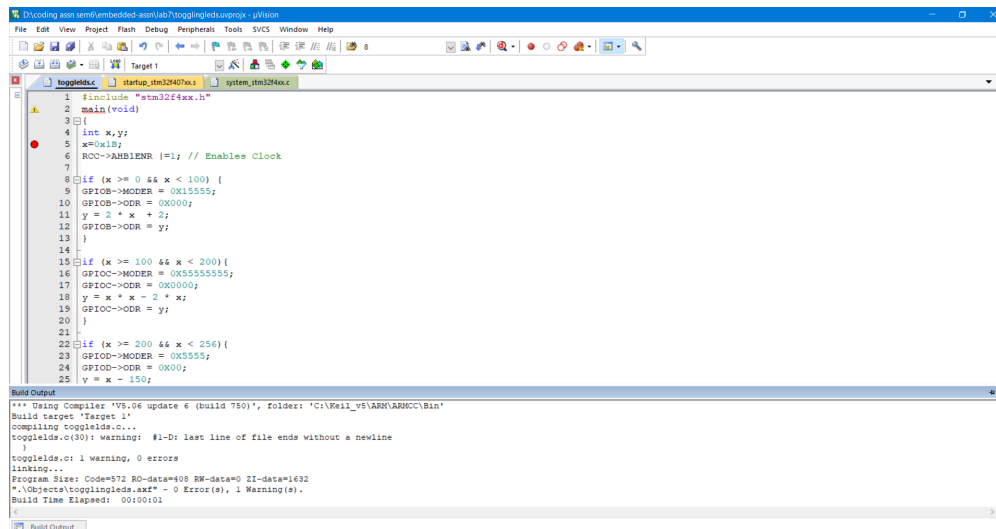
}
```

### code-explanation

- first we are enabling the clock
- then we are applying conditions on x and based on the three conditions we are assigning values to ports
- ( $0 \leq x < 100$ ) first we are setting moder value to (0001 0101 0101 0101 0101) which is 0x15555 the last 1 is due to overflow since  $2x$  can also be 9 bit number if x is 8 bit number. and then the calculated value is send to ODR
- ( $100 \leq x < 200$ ) here the value is  $x^2 - 2x$  which can be maximum 16 bits so all the moders of port B is set to output mode

- ( $200 \leq x < 256$ ) here the value is  $x - 150$  which is confined to 8 bits only so to support that only  $0x5555$  is sufficient and the output is send to odr

## build-output



The screenshot shows the Keil uVision IDE with the source code for `toggleleds.c` open. The code is as follows:

```

1 #include "stm32f4xx.h"
2 main(void)
3 {
4     int x,y;
5     x=0x1b;
6     RCC->AHB1ENR |=1; // Enables Clock
7
8     if (x >= 0 && x < 100) {
9         GPIOB->MODER = 0x15555;
10        GPIOB->ODR = 0x0000;
11        y = 2 * x + 2;
12        GPIOB->ODR = y;
13    }
14
15    if (x >= 100 && x < 200) {
16        GPIOC->MODER = 0x55555555;
17        GPIOC->ODR = 0x0000;
18        y = x * x - 2 * x;
19        GPIOC->ODR = y;
20    }
21
22    if (x >= 200 && x < 256) {
23        GPIOD->MODER = 0x5555;
24        GPIOD->ODR = 0x00;
25        y = x - 150;

```

The Build Output window at the bottom shows the following information:

```

*** Using Compiler 'V5.06 update 6 (Build 750)', folder: 'C:\Keil_v5\ARM\ARMCC\Bin'
Build target 'Target 1'
Compiling toggleleds.c...
toggleleds.c(30): warning: #1-D: last line of file ends without a newline
toggleleds.c: 1 warning, 0 errors
Linking...
Program Size: Code=572 RO-data=408 RW-data=0 ZI-data=1632
*.Object\toggleleds.asm* - 0 Error(s), 1 Warning(s).
Build Time Elapsed: 00:00:01

```

## Que-2

### code-explanation

### build-output

## Que-3

### code-explanation

### build-output

## Que-4

### code-explanation

### build-output