EMBEDDED PROGRAMMING LAB

LAB-6 DATE:23-10-2024

PREETHISH K R

Steps followed for programming in kiel using C programming

- Creating a project file
 - -Open project
 - -new uvision project
 - project name then save
- Startup for c
 - -Source group
 - -add existing file to group 'source group 1'
 - -Disk C
 - Keil
 - -ARM
 - -Startup
 - NXP
 - -LPC17xx
 - -systemLPC17xx
 - Add
- Flashing the program to hardware
- Target 1
 - -option for target
- Target
 - -use micro lib
 - -IROM1-0X0......0X80000
 - -IRAM2-0X10000000......0X8000
- Output
 - -create hex file
- Listing
 - -C preprocessor listing
- Linker
 - -use memory layout from target dialog
- Flash magic
 - -Select devise LPC1768
 - -Baud rate-115200
 - -interface None(ISP)
 - -oscillation 12
- Erase blocks used by hexfile

```
1. Write a code to toggle the LED with some delay
Program:
#include<lpc17xx.h>
int main()
unsigned int delay;
LPC_PINCON->PINSEL5=0X00000000;
LPC_GPIO2->FIODIR=0X00FF0000;
while(1)
LPC GPIO2->FIOSET=0X00FF0000;
for(delay=0;delay<50;delay++);
LPC_GPIO2->FIOCLR=0X00FF0000;
for(delay=0;delay<50;delay++);
Project
                             T
                                       iii led.c*
□ 🛅 Target 1
                                               #include<lpcl7xx.h>
   E Source Group 1
                                               int main()
      startup_LPC17xx.s
system_LPC17xx.c
                                          3 🗏 [
                                              unsigned int delay;
                                              LPC_PINCON->PINSEL5=0X00000000;
LPC_GPIO2->FIODIR=0X00FF0000;
      ⊕ ∄ led.c
                                              while (1)
                                          8 = {
9  LPC_GPIO2->FIOSET=0X00FF0000;
9  LPC_GPIO2->FIOSET=0X00FF0000;
                                              for (delay=0; delay<50; delay++);
LPC_GPIO2->FIOCLR=0X00FF0000;
for (delay=0; delay<50; delay++);</pre>
                                         10
                                          11
                                          12
                                         13
                                         14
                                          15
Build Output
Build target 'Target 1'
linking...
Program Size: Code=1432 RO-data=236 RW-data=4 ZI-data=612
".\op.axf" - 0 Error(s), 0 Warning(s).
```

Fig-1 code to toggle the LED with some delay

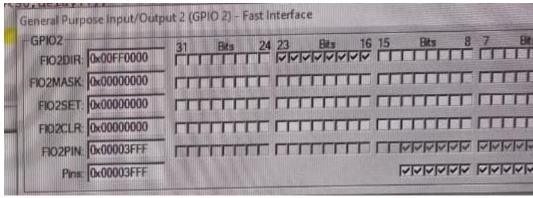


Fig1.2-output obtained

2. write a program to toggle the alternate LED

Program:

```
#include<lpc17xx.h>
int main()
unsigned int delay;
LPC_PINCON->PINSEL5=0X00000000;
LPC GPIO2->FIODIR=0X00FF0000;
while(1)
LPC GPIO2->FIOSET=0X00550000;
for(delay=0;delay<50;delay++);
LPC_GPIO2->FIOCLR=0X00550000;
for(delay=0;delay<50;delay++);</pre>
LPC GPIO2->FIOSET=0X00AA0000;
for(delay=0;delay<50;delay++);</pre>
LPC_GPIO2->FIOCLR=0X00AA0000;
for(delay=0;delay<50;delay++);
}
}
```

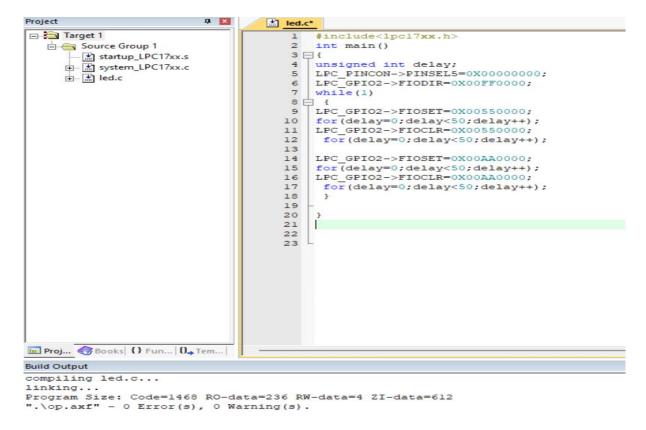


Fig 2-program to toggle the alternate LED

3. Write a program to turn ON and the LED from left to right if switch S1 is ON and right to left if switch S2 is ON (S1-P2.25, S2-P2.26)

Program:

```
#include<LPC17XX.H>
int main(void){
   unsigned int i,delay;
   LPC_PINCON->PINSEL5=0X00000000;
   LPC_GPIO2->FIODIR=0X000FF000;
   while(1){
        if(!(LPC_GPIO2->FIOPIN & 0X02000000))
        {
              for(i=23;i>=16;i--)
                     LPC GPIO2->FIOSET=(1<<i);
                     for (delay=0;delay<50;delay++);
              }
        if(!(LPC_GPIO2->FIOPIN & 0X04000000))
              for(i=16;i>=23;i++){
                     LPC GPIO2->FIOSET=(1<<i);
                     for (delay=0;delay<50;delay++);
              }
        }
   }
```

```
中 🗷
Project

☐ 

☐ Target 1

                                      #include<LPC17XX.H>
  2
                                   3 ⊟int main(void) {
     startup_LPC17xx.s
                                      unsigned int i, delay;
     i system_LPC17xx.c
                                        LPC PINCON->PINSEL5=0X00000000;
                                   5
     i led.c
                                       LPC_GPIO2->FIODIR=0X000FF000;
                                   6
                                       while(1){
                                         if(!(LPC_GPIO2->FIOPIN & 0X02000000))
                                   8
                                  9 😑
                                  10
                                            for(i=23;i>=16;i--){
                                  11
                                             LPC GPIO2->FIOSET=(1<<i);
                                  12
                                             for (delay=0;delay<50;delay++);</pre>
                                  13
                                  14
                                         if(!(LPC_GPIO2->FIOPIN & 0X04000000))
                                  15
                                  16
                                  17
                                            for(i=16;i>=23;i++){
                                  18
                                             LPC_GPIO2->FIOSET=(1<<i);
                                  19
                                             for (delay=0;delay<50;delay++);</pre>
                                  20
                                  21
                                  22
                                  23
                                  24
                                  25
                                  26
                                  27
                                  28
                                  29
Build Output
compiling led.c...
linking...
Program Size: Code=1468 RO-data=236 RW-data=4 ZI-data=612
".\op.axf" - 0 Error(s), 0 Warning(s).
```

Fig 3- turn ON and the LED from left to right if switch S1 is ON and right to left if switch S2 is ON

4. Write a program to ON and OFF the buzzer when EXT1(Switch 12) P2.11 is ON **Program:**

```
#include<LPC17XX.H>
int main(void)
{
    LPC_PINCON->PINSEL1=0X000000000;
    LPC_GPIO0->FIODIR=0X03000000;
    while(1)
    {
        if(!(LPC_GPIO2->FIOPIN & 0X00000800)))
        {
            LPC_GPIO0->FIOSET=0X03000000;
        }
```

```
}
else
LPC_GPIO0->FIOCLR=0X03000000;
Target 1
                                  ☑☆ 🕹 🗟 🏚
                                    buzenc system_LPC17xx.c
                                           #includecLPC17XX.h>
 Source Group 1

Startup LPC17xxx

System LPC17xxx

Delta buter.c
                                       Flash Magic - NON PRODUCTION USE ONLY
                                                                                                                       File ISP Options Tools Help
                                                                                                                       9 1 2 3 4 × 8 > | 9 | 1 | 0
                                             if(!(LPC_GPI02->FIOPIN &0X00000800))

LPC_GPI00->FIOSET-0X03000000;
                                                                                                                       Select Device... | LPC1768
COM Port | COM 1
                                             LPC_GPIOO->FIOCLR=OXO3000000;
                                                                                                                          Baud Rate 115200
                                                                                                                       Interface: None (ISP)

Dacillator (MHz): 12
                                                                                                                     Step 3 - Hex File
                                                                                                                      Hex File: D.\buzzer hex
                                                                                                                            Modified Wednesday, October 23, 2024, 15 14,03
                                                                                                                     St≡p 4 - Options
                                                                                                                     Verify after programming
Fit unused Flash
Gen block checksums
Execute
                                                                                                                     Download free 8051 and XA code examples using IZC, CAN, FI
                                                                                                                     vivivi.esacademy.com/faq/proqs
Blooks | () Functions | 0. Templates | III Project | <
 epiling buser.c...
Abuser.c(17): warning: $1-D: last line of file ends without a newline
 Journet of Twarning, 0 errors
naking...
Godram Size: Code=1136 RO-data=124 RW-data=4 ZI-data=516
```

Fig 4- program to ON and OFF the buzzer