**اسم الطالب : أيمن محمد نبيل محمد**

**سكشن : 2**

**قسم هندسة الحاسبات ونظم التحكم**

**Lab 5 – Task**

**Embedded Random Number**

**……………………………………….**

**Screenshot of the circuit**

**A computer screen shot of a computer

Description automatically generated**

**Code:**

**/\***

**\* File: main.c**

**\* Author: engay**

**\***

**\* Created on April 17, 2024, 2:22 AM**

**\*/**

**#define \_XTAL\_FREQ (8000000)**

**#include <xc.h>**

**#define random\_number(min,max) (rand() % ((max)-(min)+1)+(min))**

**#define LED\_RED PORTDbits.RD6**

**#define LED\_Green PORTDbits.RD7**

**#define LED\_Yellow0 PORTDbits.RD0**

**#define LED\_Yellow1 PORTDbits.RD1**

**#define LED\_Yellow2 PORTDbits.RD2**

**void keypad\_init(void)**

**{**

**OPTION\_REGbits.nRBPU = 0;**

**TRISB = 0x38; // 0011 1000 (0,1,2)-O/P (3,4,5)-I/P**

**PORTB =0x07; // 0000 0111 (0,1,2) are initially high to make rows the provider of volt**

**TRISD = 0; // Make LEDs Output**

**PORTD = 0; // Put Low on all pins**

**return;**

**}**

**char keypad\_get\_key(void)**

**{**

**char num='\0';**

**while(num=='\0')**

**{**

**// First Row**

**PORTB=0x07;**

**PORTBbits.RB0=0;**

**if(PORTBbits.RB3==0)**

**{**

**num=1;**

**}**

**else if(PORTBbits.RB4==0)**

**{**

**num=2;**

**}**

**else if(PORTBbits.RB5==0)**

**{**

**num=3;**

**}**

**// Second Row**

**PORTB=0x07;**

**PORTBbits.RB1=0;**

**if(PORTBbits.RB3==0)**

**{**

**num=4;**

**}**

**else if(PORTBbits.RB4==0)**

**{**

**num=5;**

**}**

**else if(PORTBbits.RB5==0)**

**{**

**num=6;**

**}**

**// Third Row**

**PORTB=0x07;**

**PORTBbits.RB2=0;**

**if(PORTBbits.RB3==0)**

**{**

**num=7;**

**}**

**else if(PORTBbits.RB4==0)**

**{**

**num=8;**

**}**

**else if(PORTBbits.RB5==0)**

**{**

**num=9;**

**}**

**}**

**PORTB=0x07;**

**return num;**

**}**

**void main(void) {**

**keypad\_init();**

**int actual\_num;**

**int guess\_num;**

**int i;**

**for(i=0;i<3;i++)**

**{**

**actual\_num=random\_number(1,9);**

**guess\_num=keypad\_get\_key();**

**\_\_delay\_ms(1000);**

**if(actual\_num==guess\_num)**

**{**

**PORTD=0;**

**LED\_Green=1;**

**while(1);**

**}**

**else**

**{**

**LED\_Yellow0= ((actual\_num & 1<<2)!=0);**

**LED\_Yellow1= ((actual\_num & 1<<1)!=0);**

**LED\_Yellow2= ((actual\_num & 1<<0)!=0);**

**}**

**}**

**PORTD=0x07;**

**LED\_RED=1;**

**while(1);**

**return;**

**}**