NAME: ANANYA PILLAI

Write an embedded C program for 8051 microcontrollers

1. To blink eight LEDs connected to Port 1. They should toggle between ON and OFF condition for every 200 ms approximately.

2. To blink a LEDs connected to LSB of Port 1. They should toggle between ON and OFF condition for every 500 ms approximately.

3. To toggle alternate bits of eight LEDs connected to port 0 i.e., toggle between odd LEDs and even LEDs for every 700 ms approximately.

4. To send a HEX data (0C) to port 0.

5. To send Hex data from 0 to 9 repetitively to port 0 after a delay of 500 ms.

6. To left shift 01H repetitively at port 1 for every 1000 ms.

7. To turn ON the LED connected to port 2.0 if the two sensors connected to P0.0 and P1.3 are in ON condition. Otherwise the LED should be in OFF condition.

8. To read Port 1 and if it is equal to 20H, reset port 3. Otherwise set port 2 (make it as FFH).

9. To perform AND operation between data at Port 0 & Port 1 and send the result to Port 2.

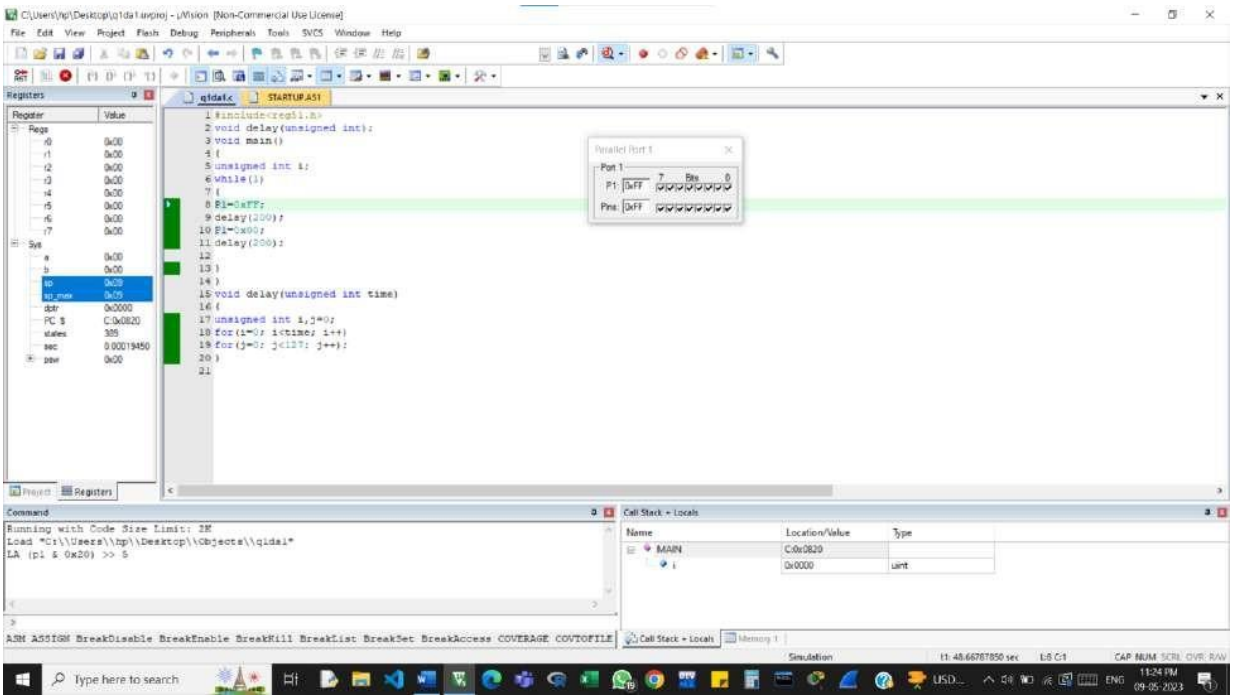
10. To monitor the door sensor, and when it opens, sound the buzzer. A door sensor is connected to P1.1 pin and a buzzer is connected to P1.7. Door sensor will be equal to zero if the door is in open condition. Buzzer should be made zero when it is in OFF condition and Buzzer should be supplied with a square waveform with 400ms time period to turn it to ON condition.

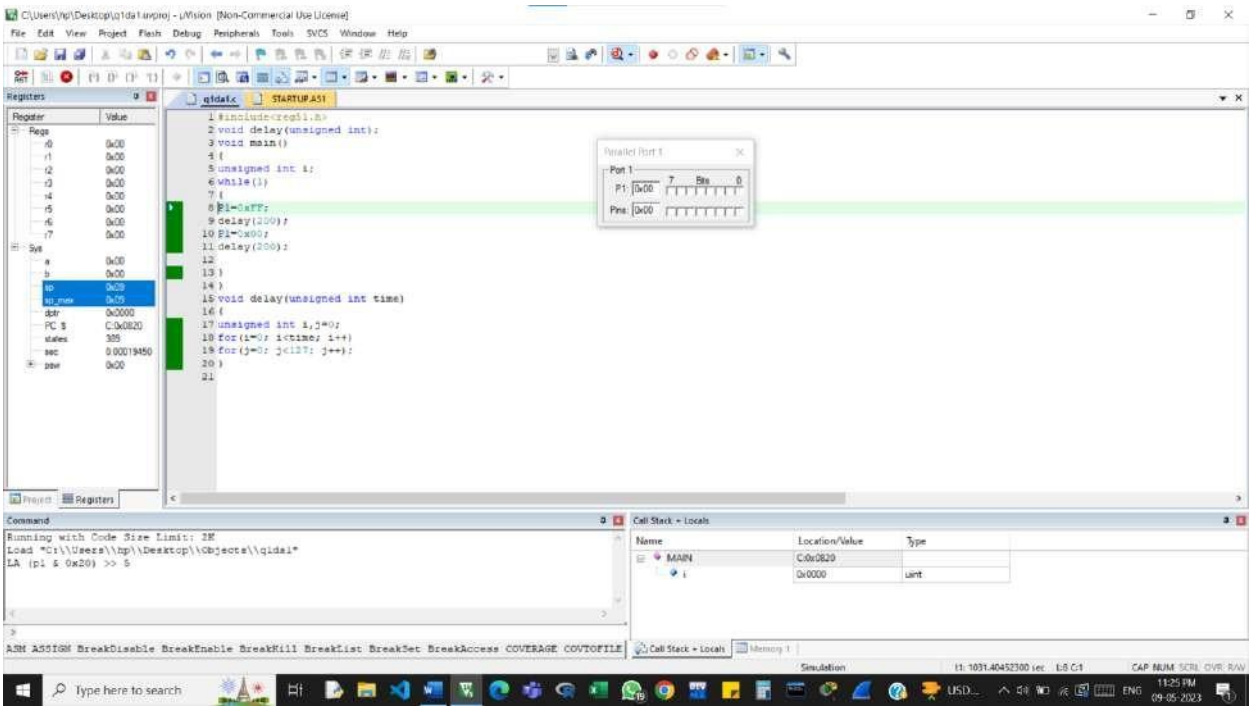
1.

CODE:

```
#include<reg51.h>
void delay(unsigned int);
void main()
{
unsigned int i;
while(1)
{
P1=0xFF;
delay(200);
P1=0x00;
delay(200);
}
}
void delay(unsigned int time)
{
unsigned int i,j=0;
for(i=0; i<time; i++)
for(j=0; j<127; j++);
}
```

OUTPUT:



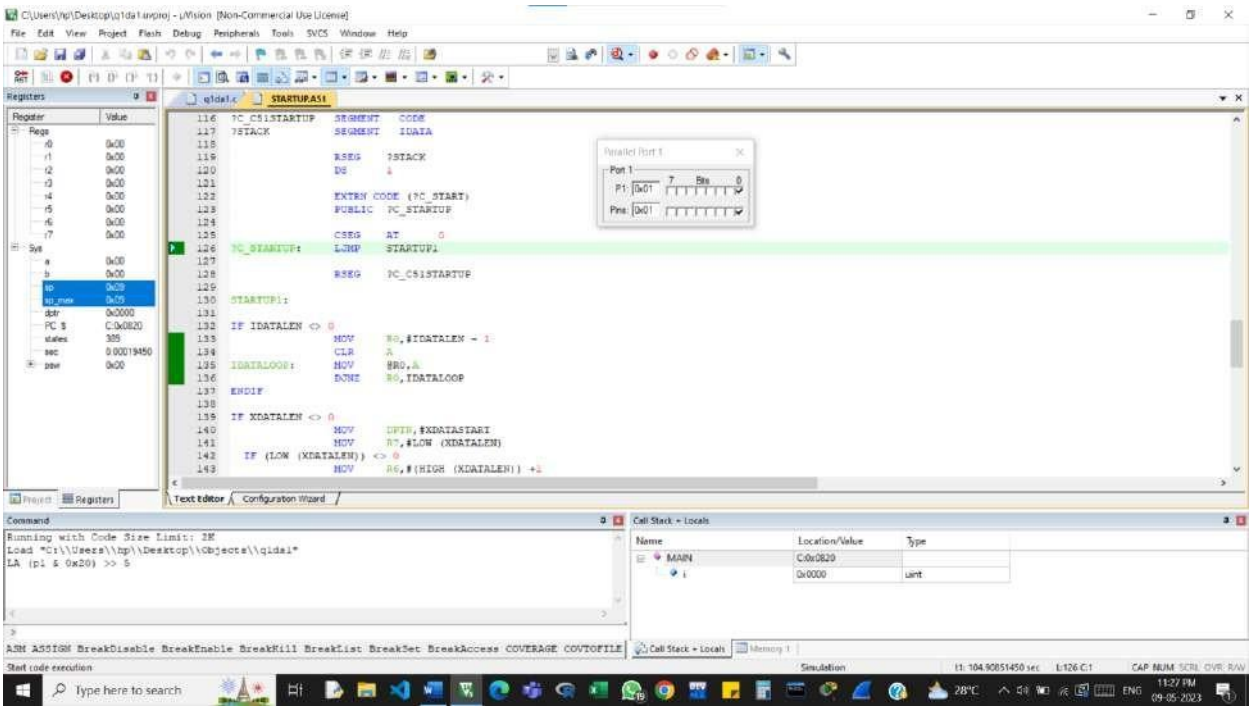


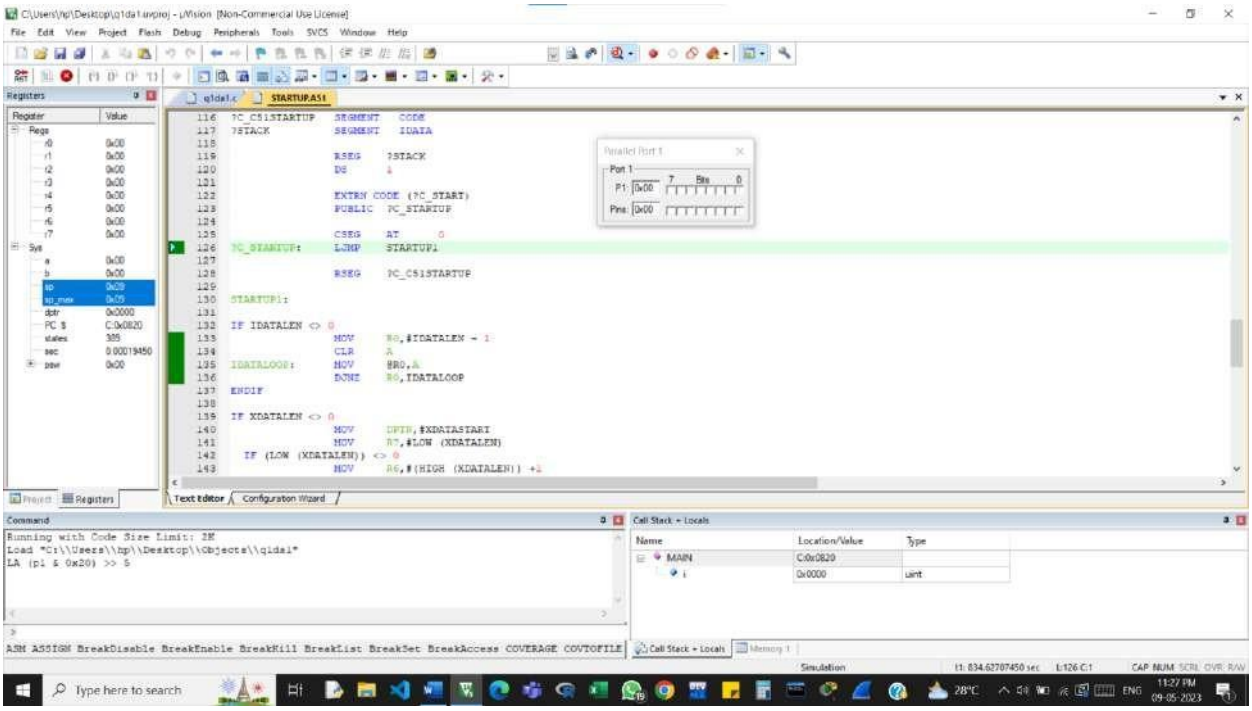
2.

CODE:

```
#include<reg51.h>
void delay(unsigned int);
void main() {
unsigned int i;
while(1)
{
P1=0x01;
delay(500);
P1=0x00;
delay(500);
}
}
void delay(unsigned int time)
{
unsigned int i,j=0;
for(i=0; i<time; i++)
for(j=0; j<127; j++); }
```

OUTPUT:





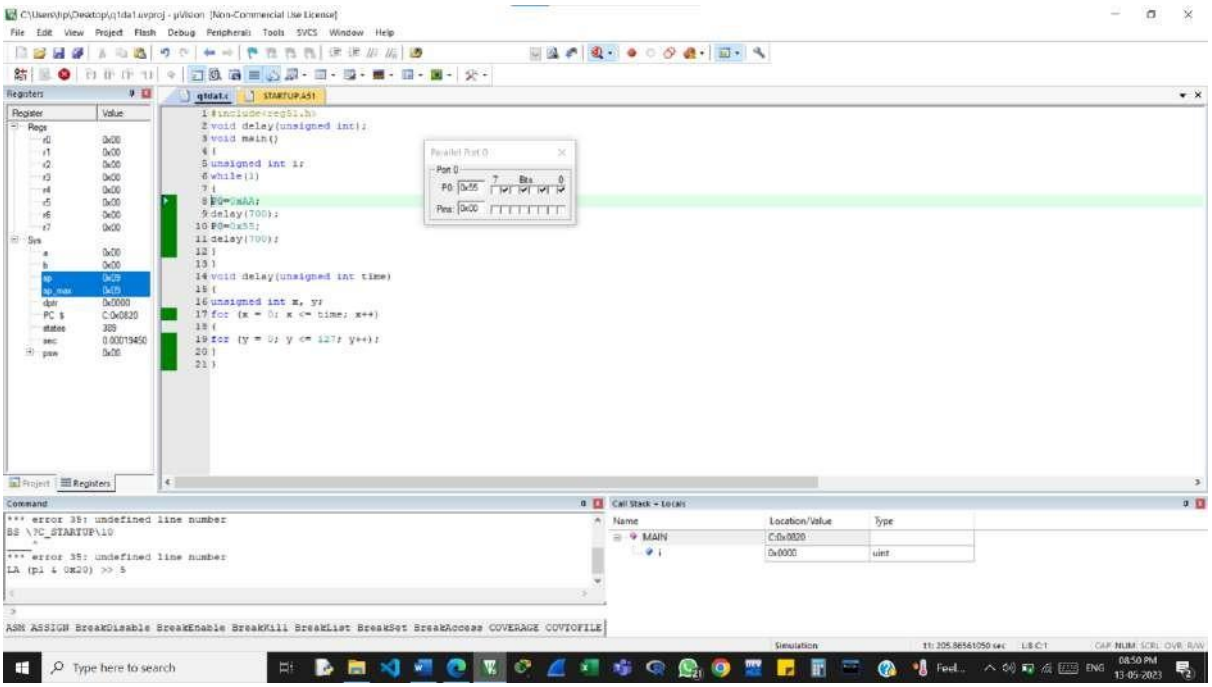
3.

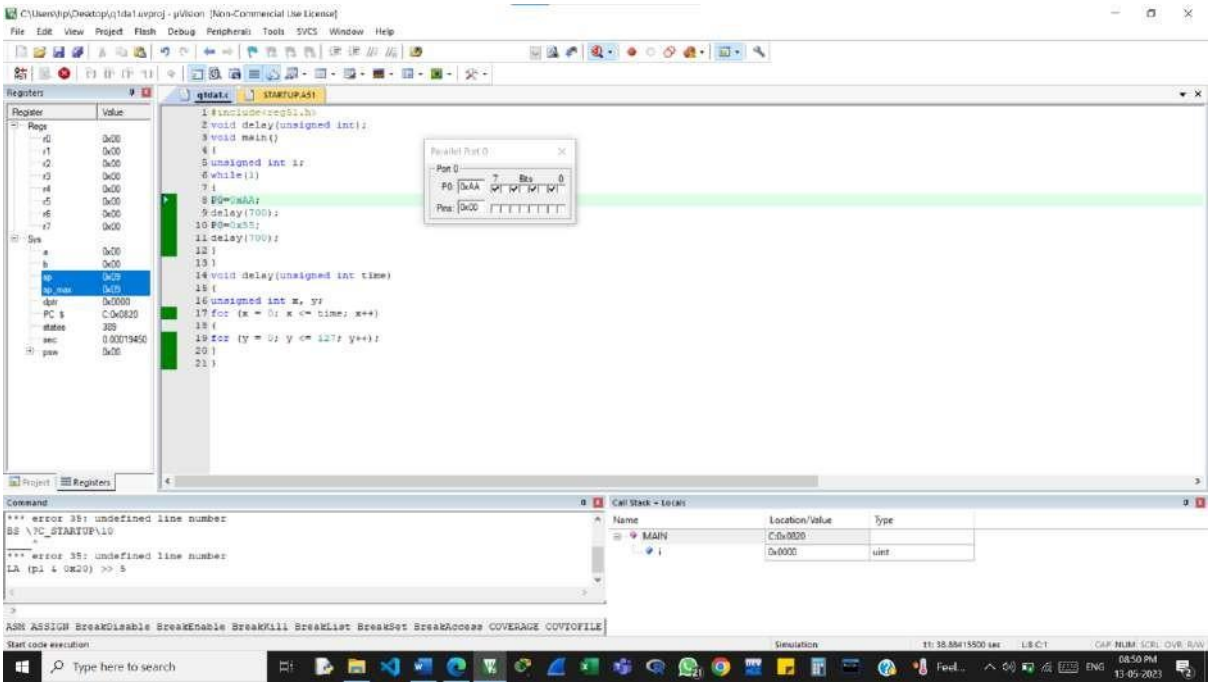
CODE:

```
#include<reg51.h>

void delay(unsigned int);

void main()
```

```
{
unsigned int i;
while(1)
{
P0=0xAA;
delay(700);
P0=0x55;
delay(700);
}
}
void delay(unsigned int time)
{
unsigned int x, y;
for (x = 0; x <= time; x++)
{
for (y = 0; y <= 127; y++);
}
}
```

OUTPUT:





4.

CODE:

```
#include<reg51.h>

void delay(unsigned int);

void main()

{

unsigned int i;
```

while(1)

{

P0=0x0C;

delay(700);

}

}

void delay(unsigned int time)

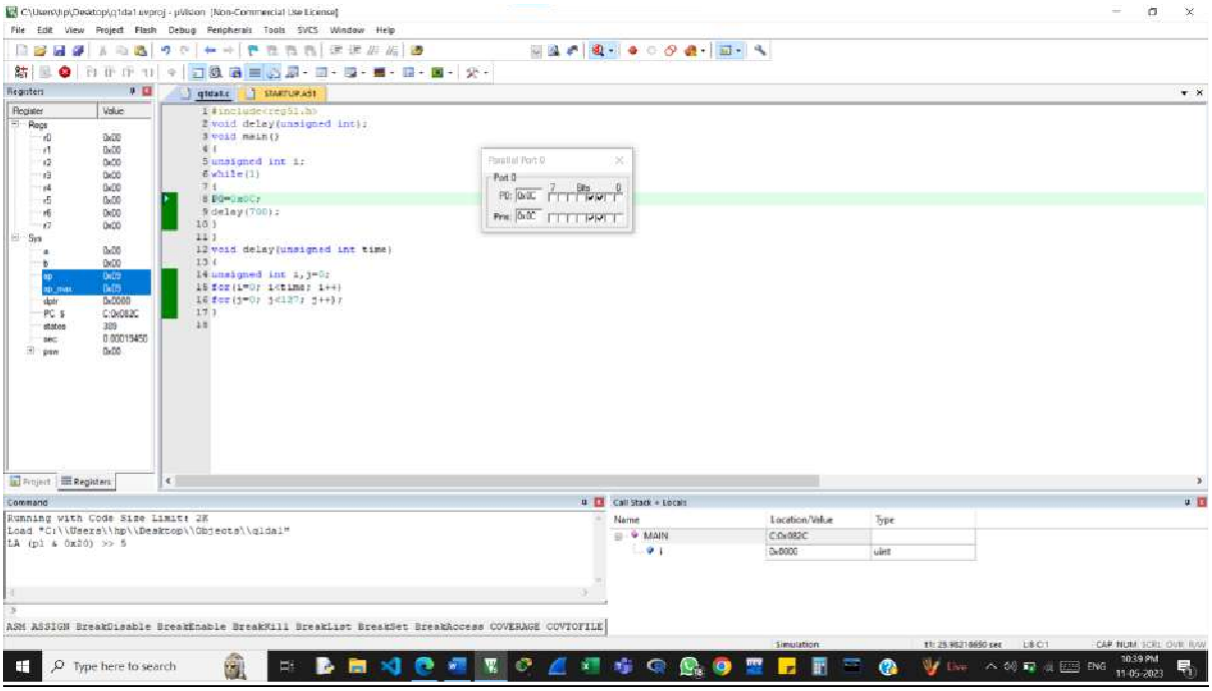
{

unsigned int i,j=0;

for(i=0; i<time; i++)

for(j=0; j<127; j++); }

OUTPUT:



5.

CODE:

#include<reg51.h>

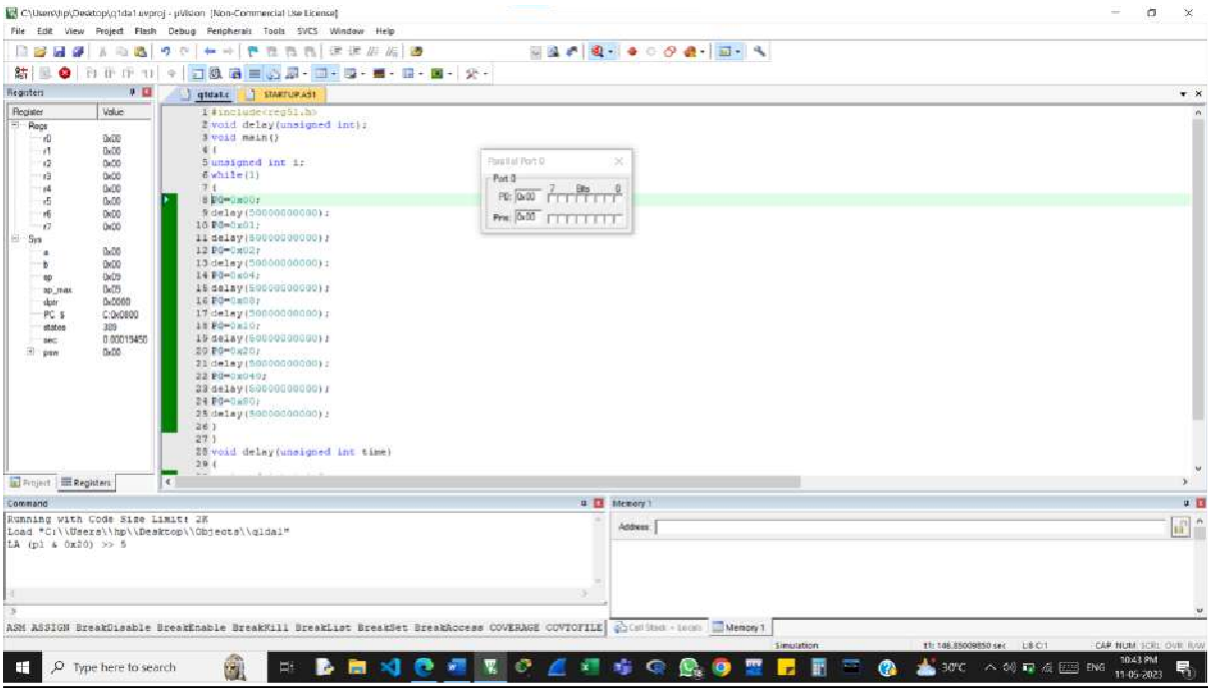
void delay(unsigned int);

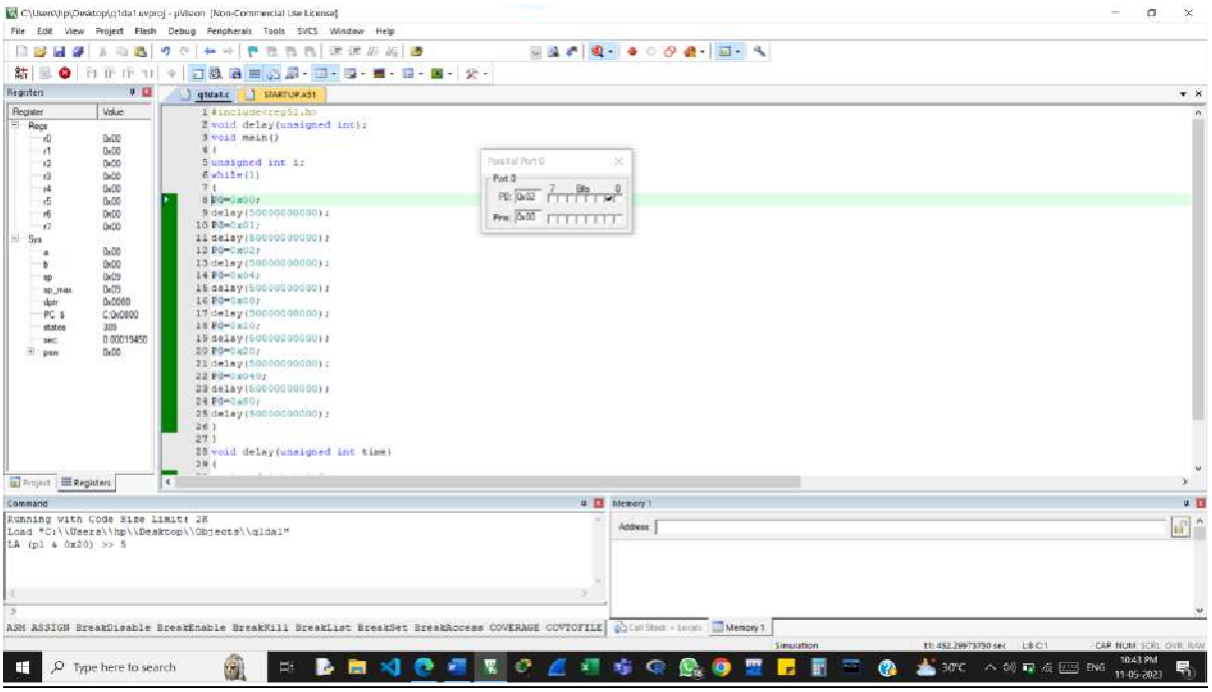
void main()

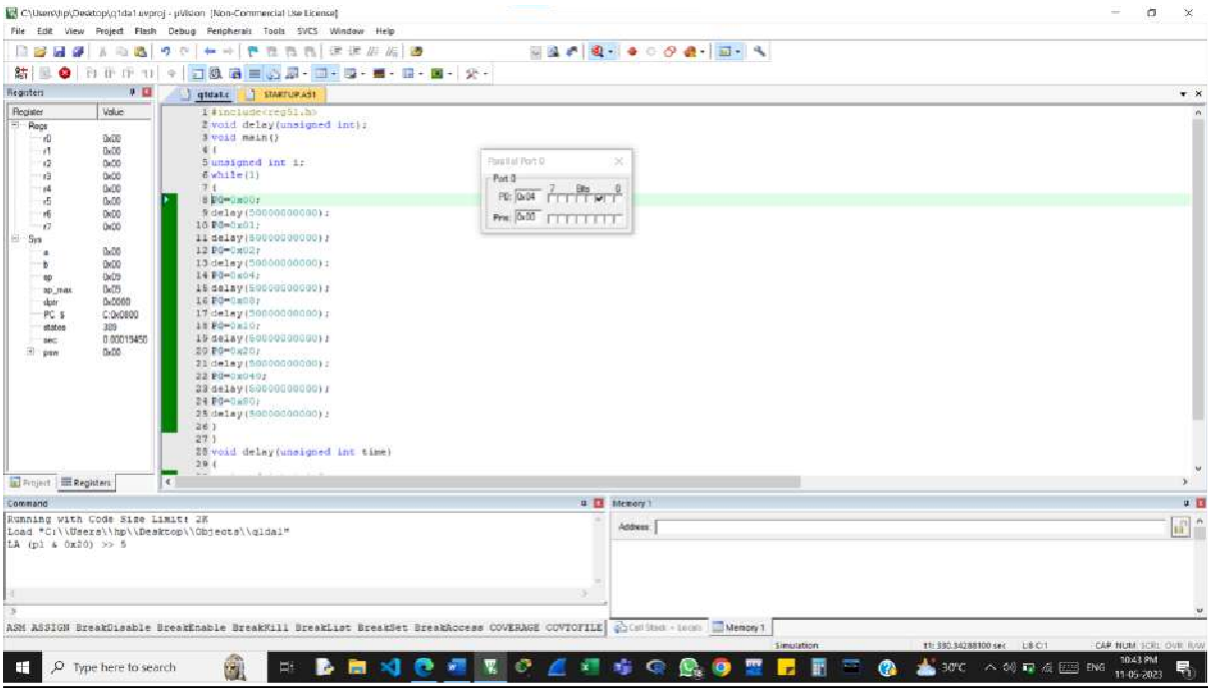
{

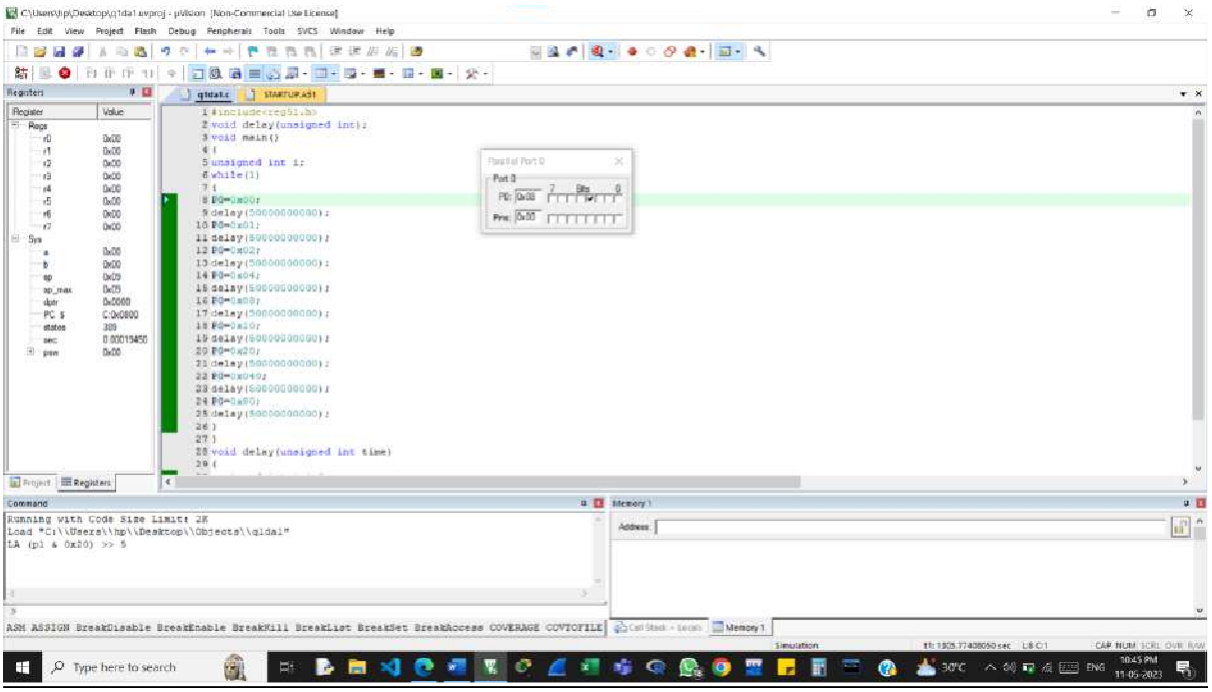
```
unsigned int i;
while(1)
{
P0=0x00;
delay(50000000000);
P0=0x01;
delay(50000000000);
P0=0x02;
delay(50000000000);
P0=0x04;
delay(50000000000);
P0=0x08;
delay(50000000000);
P0=0x10;
delay(50000000000);
P0=0x20;
delay(50000000000);
P0=0x040;
delay(50000000000);
P0=0x80;
delay(50000000000);
}
}
void delay(unsigned int time)
{
unsigned int i,j=0;
for(i=0; i<time; i++)
for(j=0; j<127; j++);
}
```

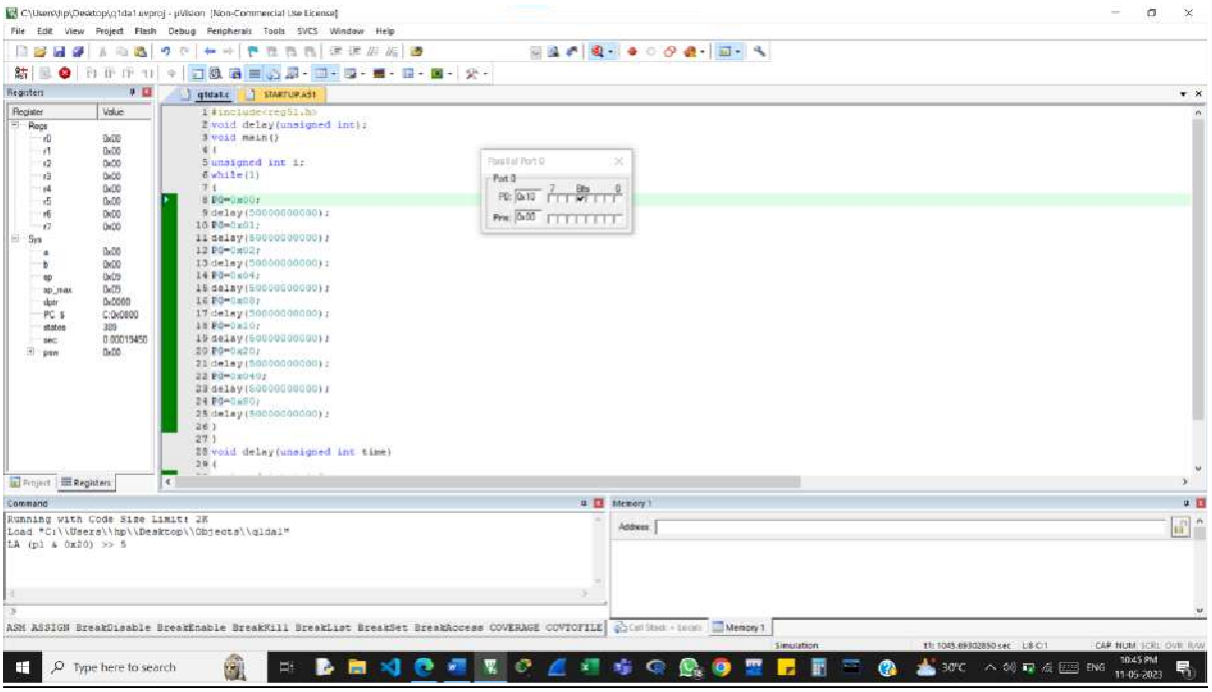
OUTPUT:

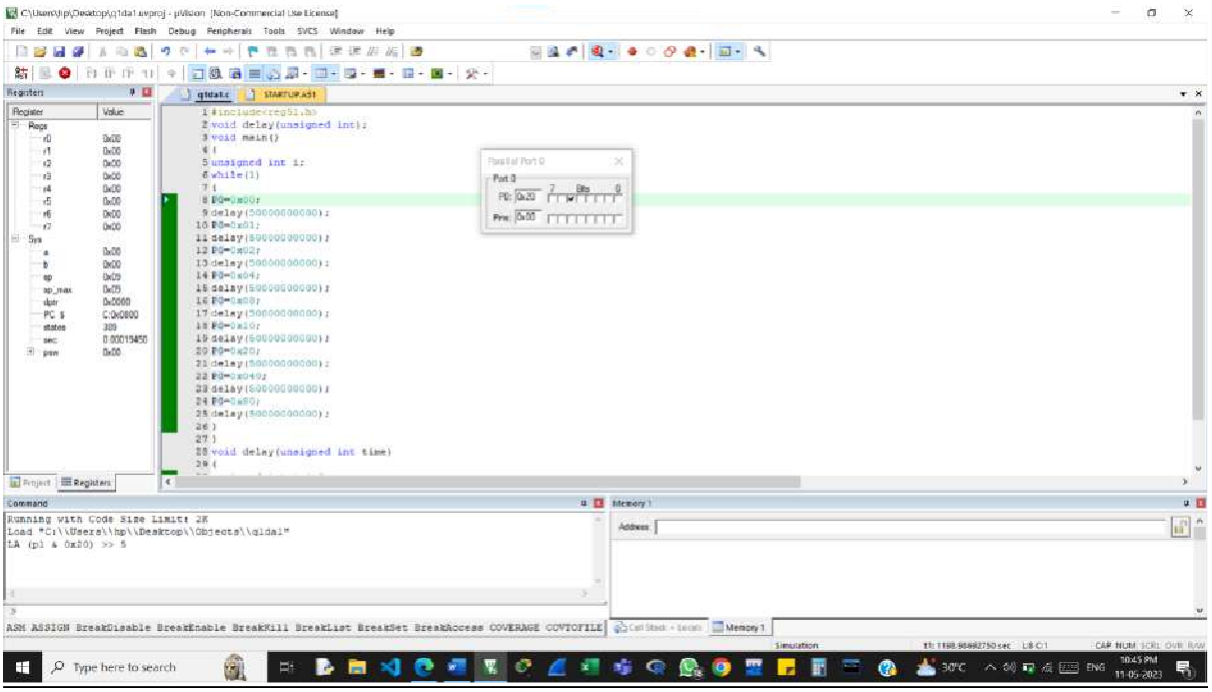

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register
Value
Regs
r0
r1
r2
r3
r4
r5
r6
r7
Sys
a
b
sp
sp_max
sptr
PC $
states
sec
psw
qldal.c
STARTUP.A51
#include<reg51.h>
void delay(unsigned int);
void main()
{
unsigned int i;
while(1)
{
P0=0x00;
delay(500000000000);
P0=0x01;
delay(500000000000);
P0=0x02;
delay(500000000000);
P0=0x04;
delay(500000000000);
P0=0x08;
delay(500000000000);
P0=0x10;
delay(500000000000);
P0=0x20;
delay(500000000000);
P0=0x40;
delay(500000000000);
P0=0x80;
delay(500000000000);
}
}
void delay(unsigned int time)
{
Parallel Port 0
Port 0
P0:
Pins:
7
Bits
0
Project
Registers
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\hp\\Desktop\\Objects\\qldal"
LA (p1 & 0x20) >> 5
Memory 1
Address:
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Call Stack + Locals
Memory 1
Simulation
L:8 C:1
CAP NUM SCRL OVR R/W
Type here to search
30°C
ENG
10:43 PM
11-05-2023

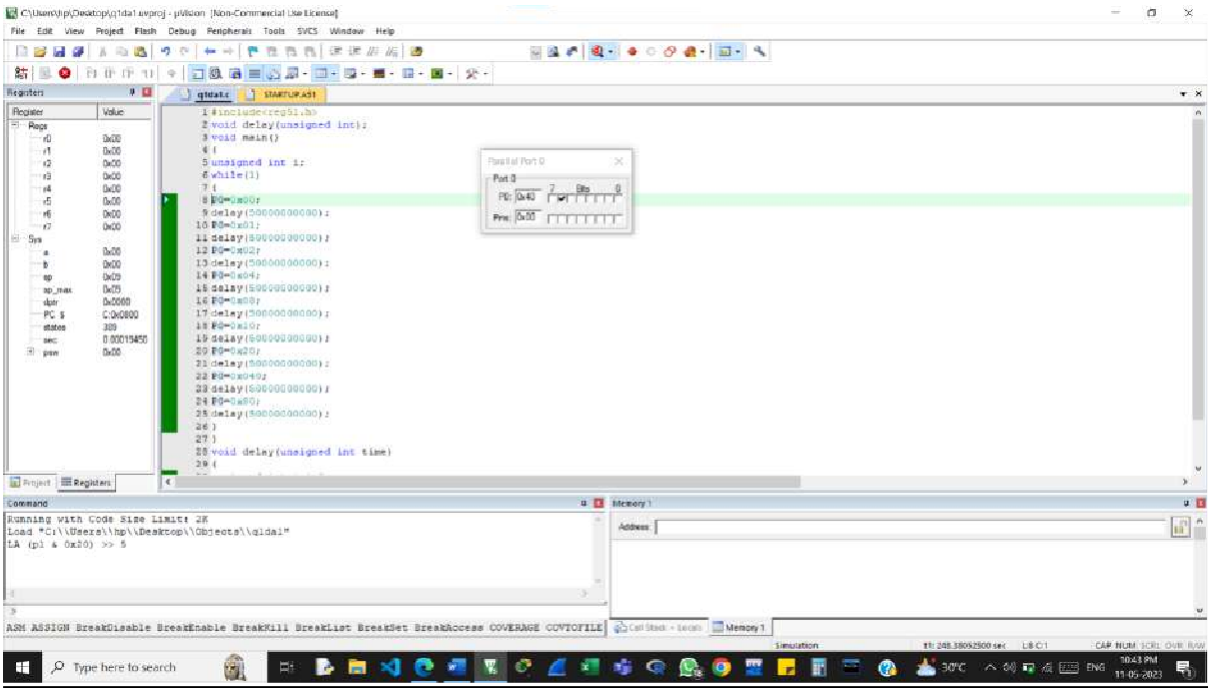

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register
Value
Regs
r0
r1
r2
r3
r4
r5
r6
r7
Sys
a
b
sp
sp_max
sptr
PC $
states
sec
psw
qldal.c
STARTUP.A51
#include<reg51.h>
void delay(unsigned int);
void main()
{
unsigned int i;
while(1)
{
P0=0x00;
delay(500000000000);
P0=0x01;
delay(500000000000);
P0=0x02;
delay(500000000000);
P0=0x04;
delay(500000000000);
P0=0x08;
delay(500000000000);
P0=0x10;
delay(500000000000);
P0=0x20;
delay(500000000000);
P0=0x40;
delay(500000000000);
P0=0x80;
delay(500000000000);
}
}
void delay(unsigned int time)
{
Parallel Port 0
Port 0
P0:
Pins:
7
Bits
0
Project
Registers
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\hp\\Desktop\\Objects\\qldal"
LA (p1 & 0x20) >> 5
Memory 1
Address:
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Call Stack + Locals
Memory 1
Simulation
L:8 C:1
CAP NUM SCRL OVR R/W
Type here to search
30°C
ENG
10:43 PM
11-05-2023

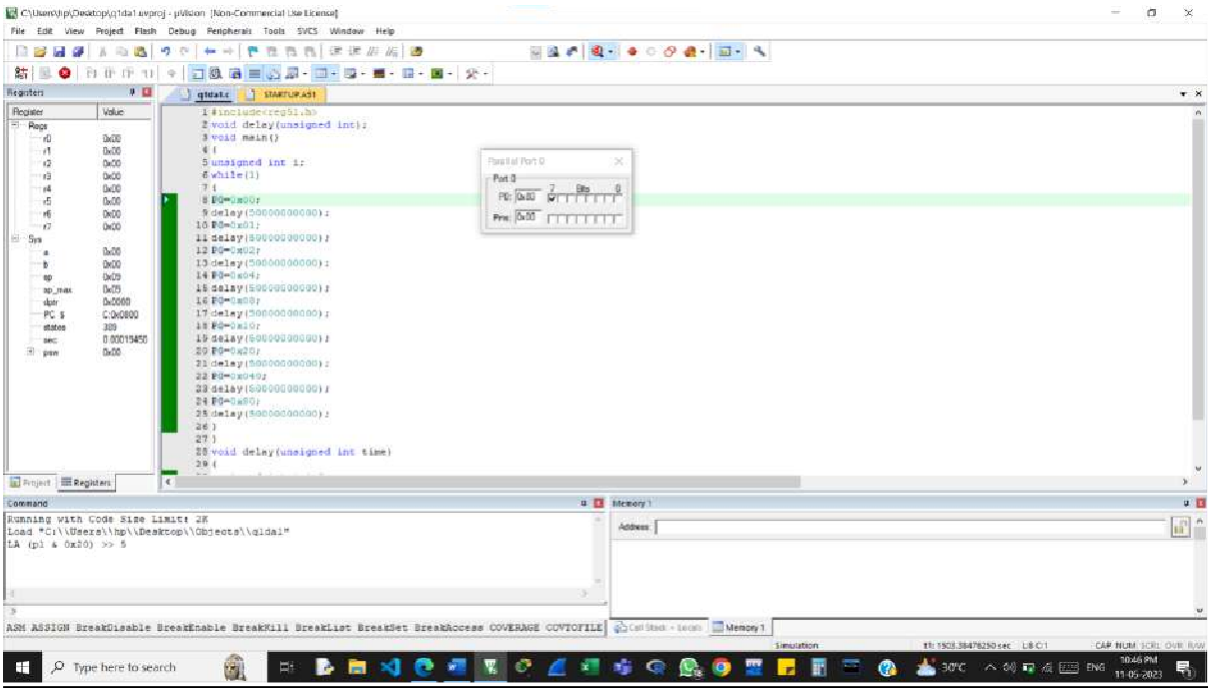

File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register
Value
Regs
r0
r1
r2
r3
r4
r5
r6
r7
Sys
a
b
sp
sp_max
sptr
PC $
states
sec
psw
qldal.c
STARTUP.A51
1 #include<reg51.h>
2 void delay(unsigned int);
3 void main()
4 {
5 unsigned int i;
6 while(1)
7 {
8 P0=0x00;
9 delay(50000000000);
10 P0=0x01;
11 delay(50000000000);
12 P0=0x02;
13 delay(50000000000);
14 P0=0x04;
15 delay(50000000000);
16 P0=0x08;
17 delay(50000000000);
18 P0=0x10;
19 delay(50000000000);
20 P0=0x20;
21 delay(50000000000);
22 P0=0x40;
23 delay(50000000000);
24 P0=0x80;
25 delay(50000000000);
26 }
27 }
28 void delay(unsigned int time)
29 {
Parallel Port 0
Port 0
P0: 0x04
Bits
Pins: 0x00
Project
Registers
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\hp\\Desktop\\Objects\\qldal"
LA (p1 & 0x20) >> 5
Memory 1
Address:
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Call Stack + Locals
Memory 1
Simulation
L:8 C:1
CAP NUM SCRL OVR R/W
Type here to search
30°C
ENG
10:43 PM
11-05-2023


File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register
Value
Regs
r0
r1
r2
r3
r4
r5
r6
r7
Sys
a
b
sp
sp_max
sptr
PC $
states
sec
psw
qldal.c
STARTUP.A51
1 #include<reg51.h>
2 void delay(unsigned int);
3 void main()
4 {
5 unsigned int i;
6 while(1)
7 {
8 P0=0x00;
9 delay(50000000000);
10 P0=0x01;
11 delay(50000000000);
12 P0=0x02;
13 delay(50000000000);
14 P0=0x04;
15 delay(50000000000);
16 P0=0x08;
17 delay(50000000000);
18 P0=0x10;
19 delay(50000000000);
20 P0=0x20;
21 delay(50000000000);
22 P0=0x40;
23 delay(50000000000);
24 P0=0x80;
25 delay(50000000000);
26 }
27 }
28 void delay(unsigned int time)
29 {
Parallel Port 0
Port 0
P0: 0x08
Bits
Pins: 0x00
Project
Registers
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\hp\\Desktop\\Objects\\qldal"
LA (p1 & 0x20) >> 5
Memory 1
Address:
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Call Stack + Locals
Memory 1
Simulation
L:8 C:1
CAP NUM SCRL OVR R/W
Type here to search
30°C
ENG
10:43 PM
11-05-2023


File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register
Value
Regs
r0
r1
r2
r3
r4
r5
r6
r7
Sys
a
b
sp
sp_max
sptr
PC $
states
sec
psw
q1da1.c
STARTUP.A51
#include<reg51.h>
void delay(unsigned int);
void main()
{
unsigned int i;
while(1)
{
P0=0x00;
delay(500000000000);
P0=0x01;
delay(500000000000);
P0=0x02;
delay(500000000000);
P0=0x04;
delay(500000000000);
P0=0x08;
delay(500000000000);
P0=0x10;
delay(500000000000);
P0=0x20;
delay(500000000000);
P0=0x40;
delay(500000000000);
P0=0x80;
delay(500000000000);
}
}
void delay(unsigned int time)
{
Parallel Port 0
Port 0
P0:
Pins:
Bits
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\hp\\Desktop\\Objects\\q1da1"
LA (p1 & 0x20) >> 5
Memory 1
Address:
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Call Stack + Locals
Memory 1
Simulation
Type here to search
ENG
11-05-2023


File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register
Value
Regs
r0
r1
r2
r3
r4
r5
r6
r7
Sys
a
b
sp
sp_max
sptr
PC $
states
sec
psw
q1da1.c
STARTUP.A51
#include<reg51.h>
void delay(unsigned int);
void main()
{
unsigned int i;
while(1)
{
P0=0x00;
delay(500000000000);
P0=0x01;
delay(500000000000);
P0=0x02;
delay(500000000000);
P0=0x04;
delay(500000000000);
P0=0x08;
delay(500000000000);
P0=0x10;
delay(500000000000);
P0=0x20;
delay(500000000000);
P0=0x40;
delay(500000000000);
P0=0x80;
delay(500000000000);
}
}
void delay(unsigned int time)
{
Parallel Port 0
Port 0
P0:
Pins:
Bits
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\hp\\Desktop\\Objects\\q1da1"
LA (p1 & 0x20) >> 5
Memory 1
Address:
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Call Stack + Locals
Memory 1
Simulation
Type here to search
ENG
11-05-2023





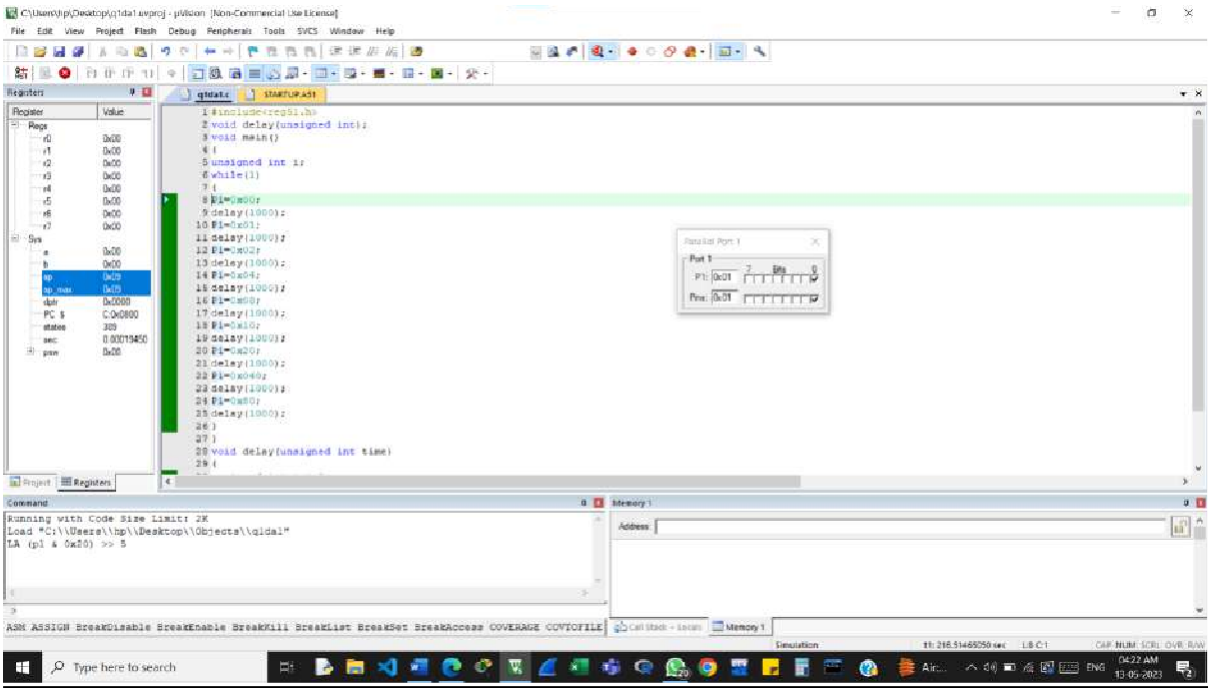
6.

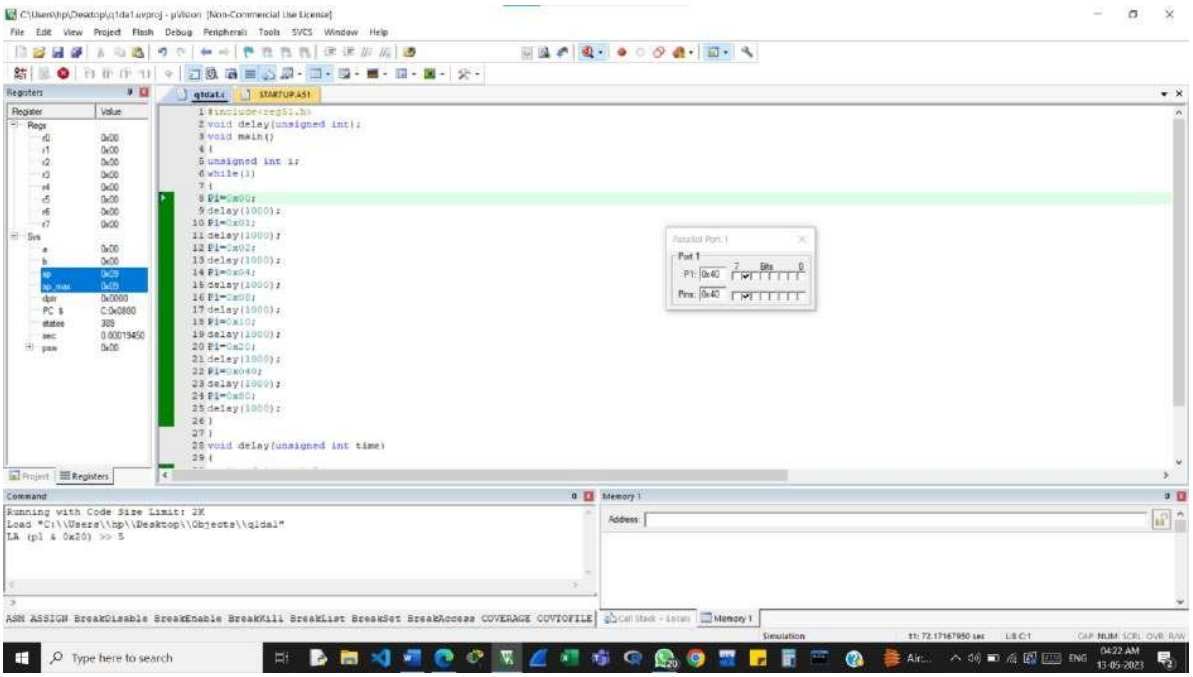
CODE:

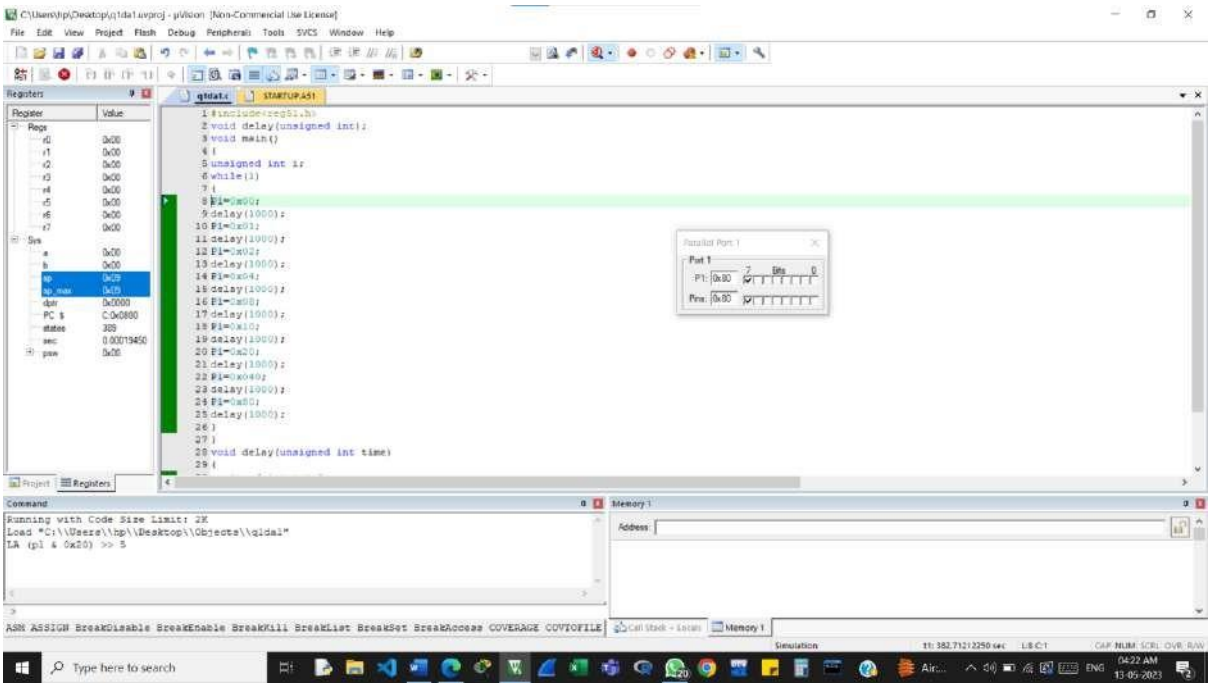
```
#include<reg51.h>

void delay(unsigned int);

void main()

{

unsigned int i;
```

```
while(1)
{
P1=0x00;
delay(1000);
P1=0x01;
delay(1000);
P1=0x02;
delay(1000);
P1=0x04;
delay(1000);
P1=0x08;
delay(1000);
P1=0x10;
delay(1000);
P1=0x20;
delay(1000);
P1=0x040;
delay(1000);
P1=0x80;
delay(1000);
}
}
void delay(unsigned int time)
{
unsigned int i,j=0;
for(i=0; i<time; i++)
for(j=0; j<127; j++);
}
```

OUTPUT:


C:\Users\hp\Desktop\q1da1.uvproj - µVision [Non-Commercial Use License]
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register Value
Regs
r0 0x00
r1 0x00
r2 0x00
r3 0x00
r4 0x00
r5 0x00
r6 0x00
r7 0x00
Sys
a 0x00
b 0x00
sp 0x09
sp_max 0x09
dptr 0x0000
PC $ C:0x0800
states 309
sec 0.00019450
psw 0x00
qtdat.c
STARTUP.A51
1 #include<reg51.h>
2 void delay(unsigned int);
3 void main()
4 {
5 unsigned int i;
6 while(1)
7 {
8 P1=0x00;
9 delay(1000);
10 P1=0x01;
11 delay(1000);
12 P1=0x02;
13 delay(1000);
14 P1=0x04;
15 delay(1000);
16 P1=0x08;
17 delay(1000);
18 P1=0x10;
19 delay(1000);
20 P1=0x20;
21 delay(1000);
22 P1=0x40;
23 delay(1000);
24 P1=0x80;
25 delay(1000);
26 }
27 }
28 void delay(unsigned int time)
29 {
Parallel Port 1
Port 1
P1: 0x01
Pins: 0x01
Project
Registers
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\hp\\Desktop\\Objects\\q1da1"
LA (p1 & 0x20) >> 5
Memory 1
Address:
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Call Stack + Locals
Memory 1
Simulation
t1: 216.51465250 sec
L:8 C:1
CAP NUM SCRL OVR R/W
Type here to search
ENG
04:22 AM
13-05-2023


C:\Users\hp\Desktop\q1da1.uvproj - µVision [Non-Commercial Use License]
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
Registers
Register Value
Regs
r0 0x00
r1 0x00
r2 0x00
r3 0x00
r4 0x00
r5 0x00
r6 0x00
r7 0x00
Sys
a 0x00
b 0x00
sp 0x09
sp_max 0x09
dptr 0x0000
PC $ C:0x0800
states 309
sec 0.00019450
psw 0x00
qtdat.c
STARTUP.A51
1 #include<reg51.h>
2 void delay(unsigned int);
3 void main()
4 {
5 unsigned int i;
6 while(1)
7 {
8 P1=0x00;
9 delay(1000);
10 P1=0x01;
11 delay(1000);
12 P1=0x02;
13 delay(1000);
14 P1=0x04;
15 delay(1000);
16 P1=0x08;
17 delay(1000);
18 P1=0x10;
19 delay(1000);
20 P1=0x20;
21 delay(1000);
22 P1=0x40;
23 delay(1000);
24 P1=0x80;
25 delay(1000);
26 }
27 }
28 void delay(unsigned int time)
29 {
Parallel Port 1
Port 1
P1: 0x40
Pins: 0x40
Project
Registers
Command
Running with Code Size Limit: 2K
Load "C:\\Users\\hp\\Desktop\\Objects\\q1da1"
LA (p1 & 0x20) >> 5
Memory 1
Address:
ASM ASSIGN BreakDisable BreakEnable BreakKill BreakList BreakSet BreakAccess COVERAGE COVTOFILE
Call Stack + Locals
Memory 1
Simulation
t1: 72.17167950 sec
L:8 C:1
CAP NUM SCRL OVR R/W
Type here to search
ENG
04:22 AM
13-05-2023



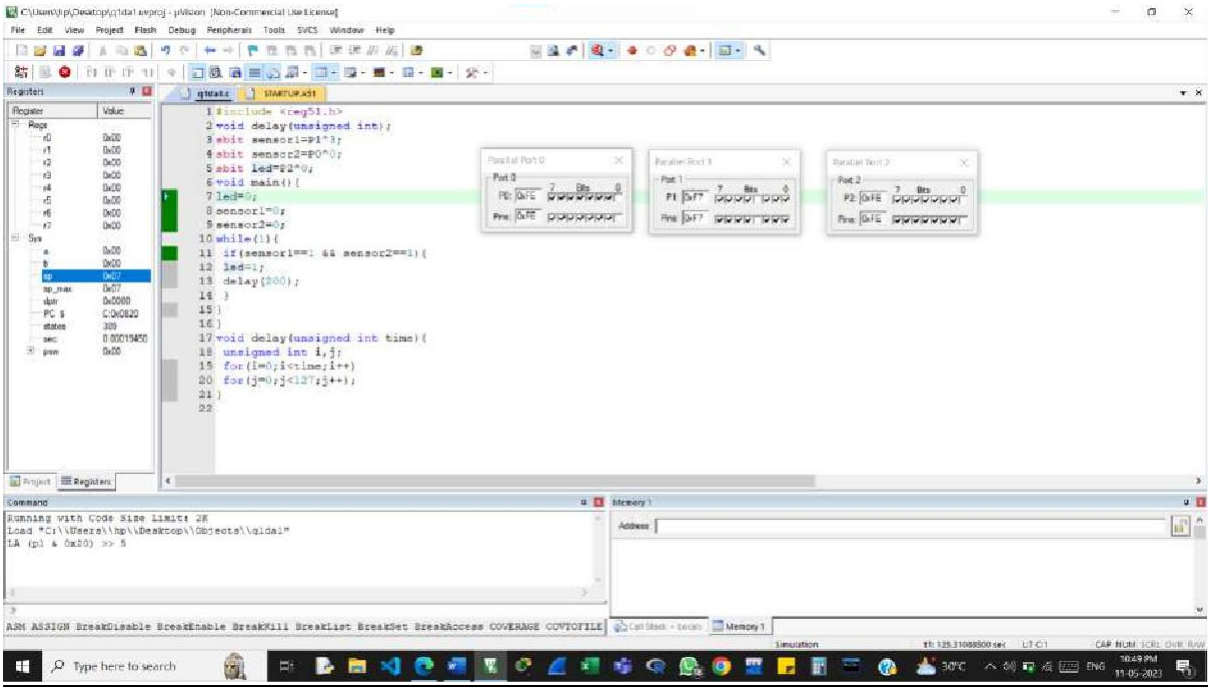
7.

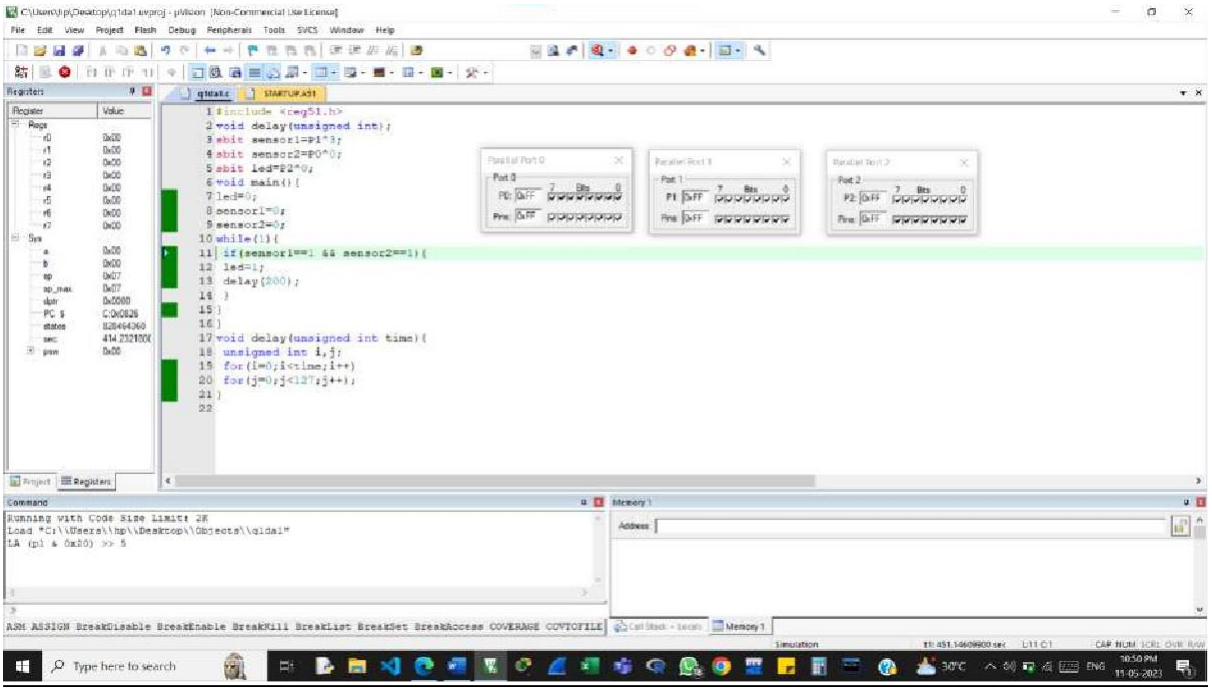
CODE:

```
#include <reg51.h>
void delay(unsigned int);
sbit sensor1=P1^3;
sbit sensor2=P0^0;
sbit led=P2^0;
void main(){
led=0;
sensor1=0;
sensor2=0;
while(1){
 if(sensor1==1 && sensor2==1){
 led=1;
 delay(200);
 }
}
}
void delay(unsigned int time){
```

```
unsigned int i,j;
for(i=0;i<time;i++)
for(j=0;j<127;j++);
}
```

OUTPUT:



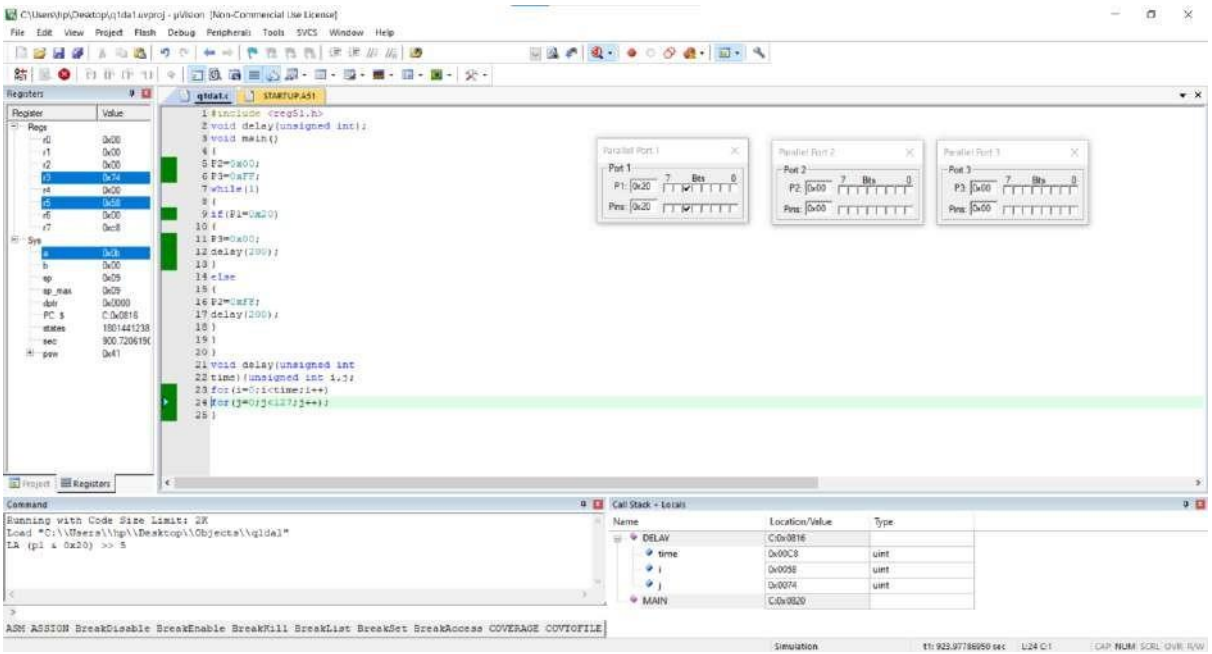


8.

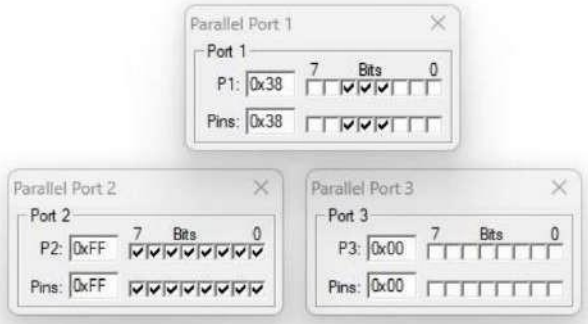
CODE:

```
#include <reg51.h>
void delay(unsigned int);
void main()
{
P2=0x00;
P3=0xFF;
while(1)
{
 if(P1=0x20)
 {
 P3=0x00;
 delay(200);
 }
 else
 {
 P2=0xFF;
 delay(200);
 }
}
}
void delay(unsigned int time){
 unsigned int i,j;
 for(i=0;i<time;i++)
 for(j=0;j<127;j++);
}
```

OUTPUT:



```
#include <reg51.h>
void delay(unsigned int);

void main()
{
P2=0x00;
P3=0xFF;

while(1)
{
 if(P1==0x20)
 {
  P3=0x00;

 }
 else
 {
 P2=0xFF;

 }
}
}
void delay(unsigned int time){
 unsigned int i,j;
 for(i=0;i<time;i++)
 for(j=0;j<127;j++);
}
```



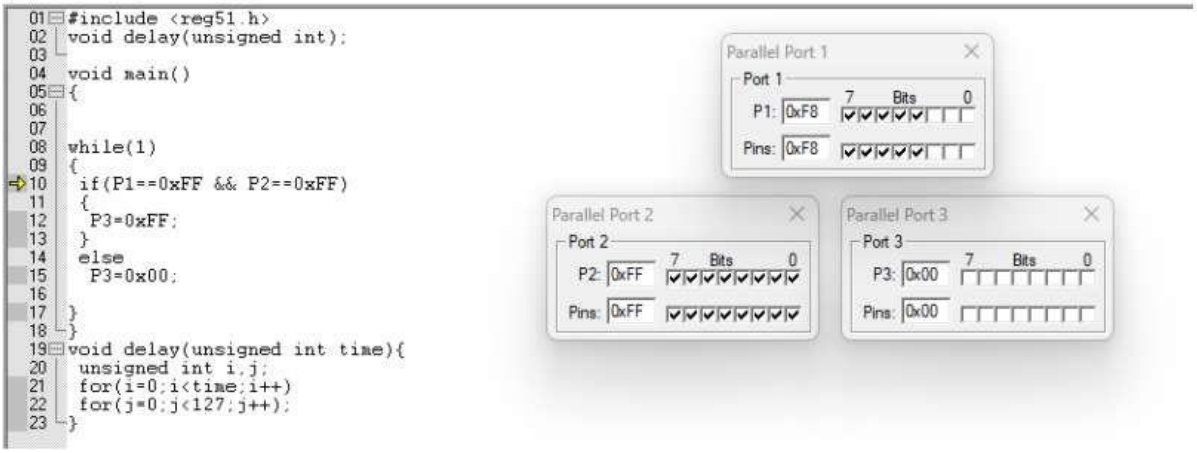
9.

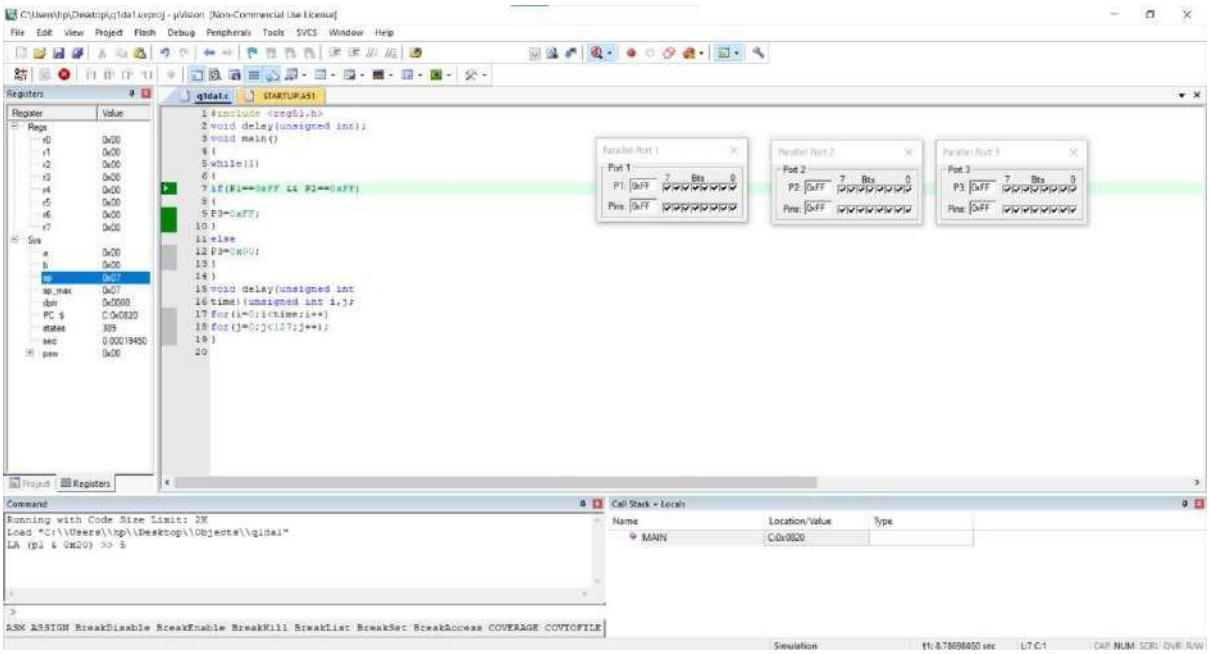
CODE:

```
#include <reg51.h>

void delay(unsigned int);

void main()

{

while(1)

{

 if(P1==0xFF && P2==0xFF)
```

```
 {
 P3=0xFF;
 }
 else
 P3=0x00;
}
}
void delay(unsigned int time){
 unsigned int i,j;
 for(i=0;i<time;i++)
 for(j=0;j<127;j++);
}
```

OUTPUT:





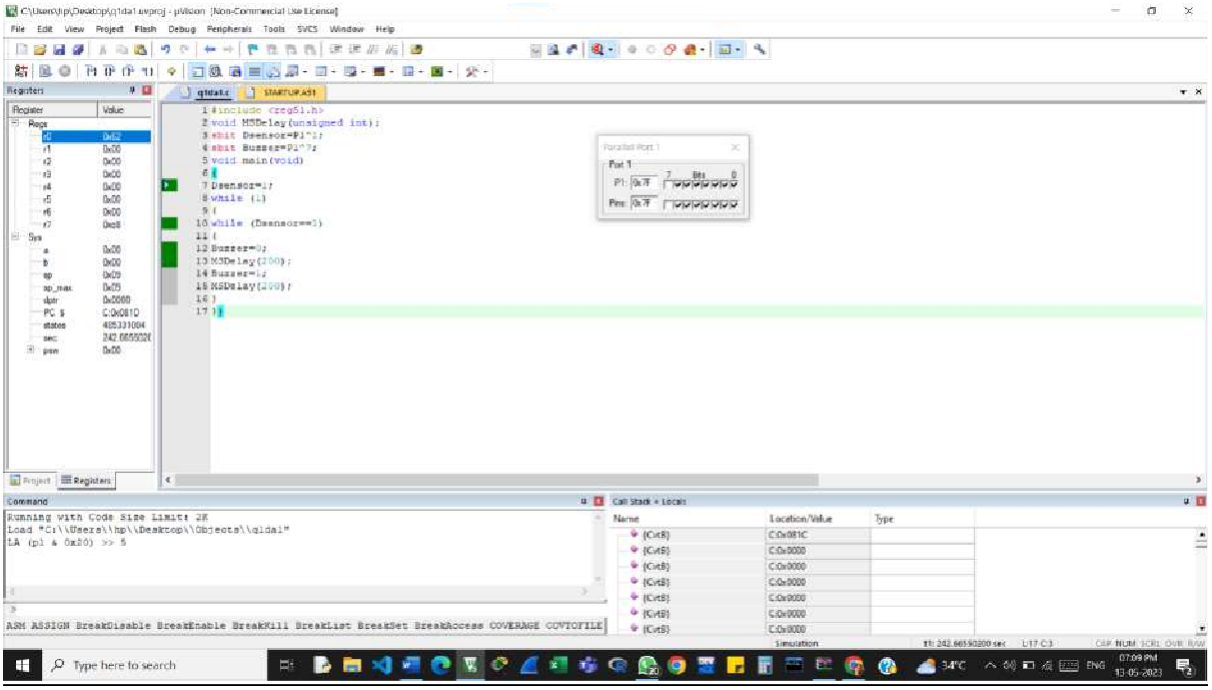
10.

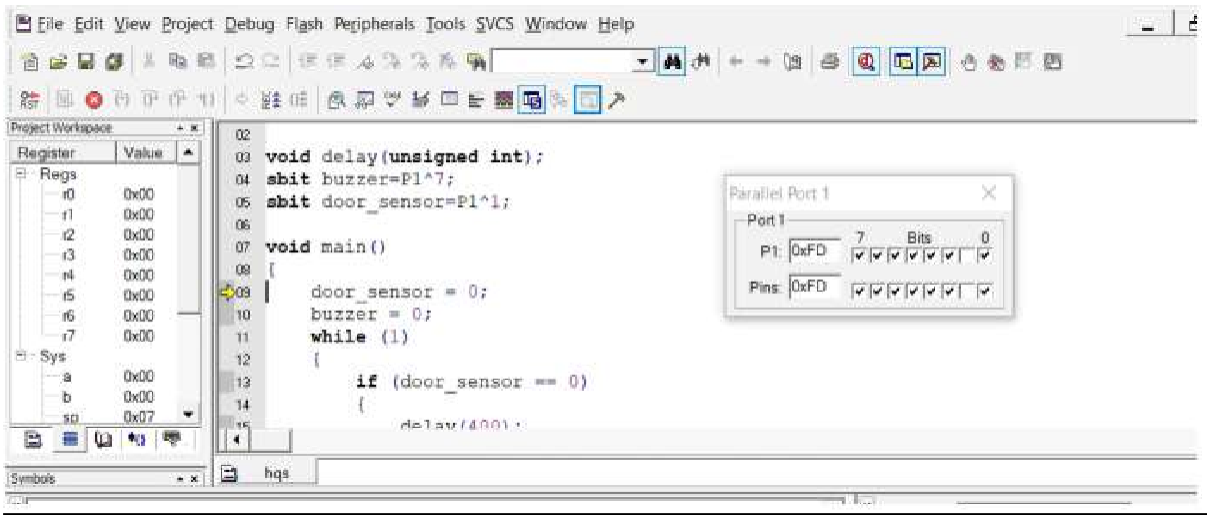
CODE:

```
#include <reg51.h>
void delay(unsigned int );
sbit buzzer=P1^7;
sbit door_sensor=P1^1;
void main()
{
buzzer = 0;
while (1)
 {
 if (door_sensor == 0)
 {
 delay(400);
 if (door_sensor == 0)
 {
 buzzer = 1;
 delay(400);
 buzzer = 0;
 }
```

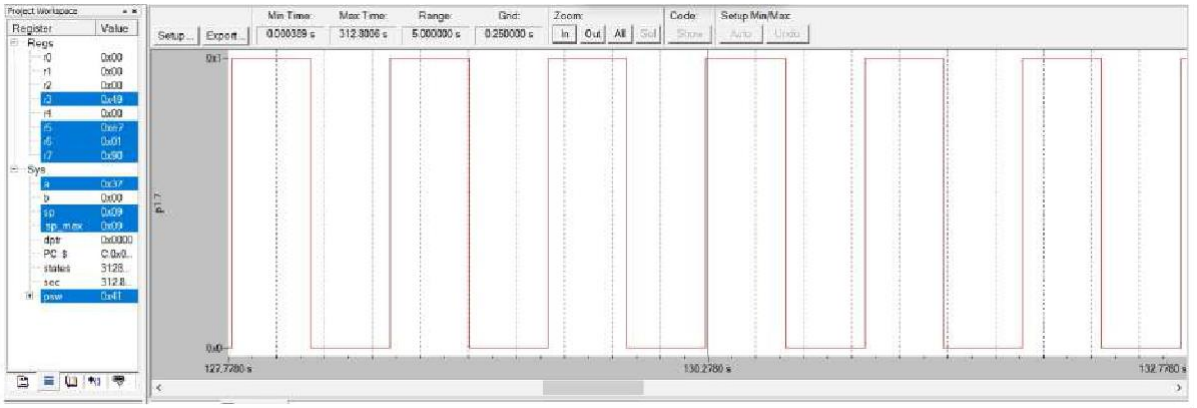
```
 }
 }
}
void delay(unsigned int time)
{
 unsigned int i, j;
 for(i = 0; i < time; i++)
 for(j = 0; j < 127; j++);
}
```

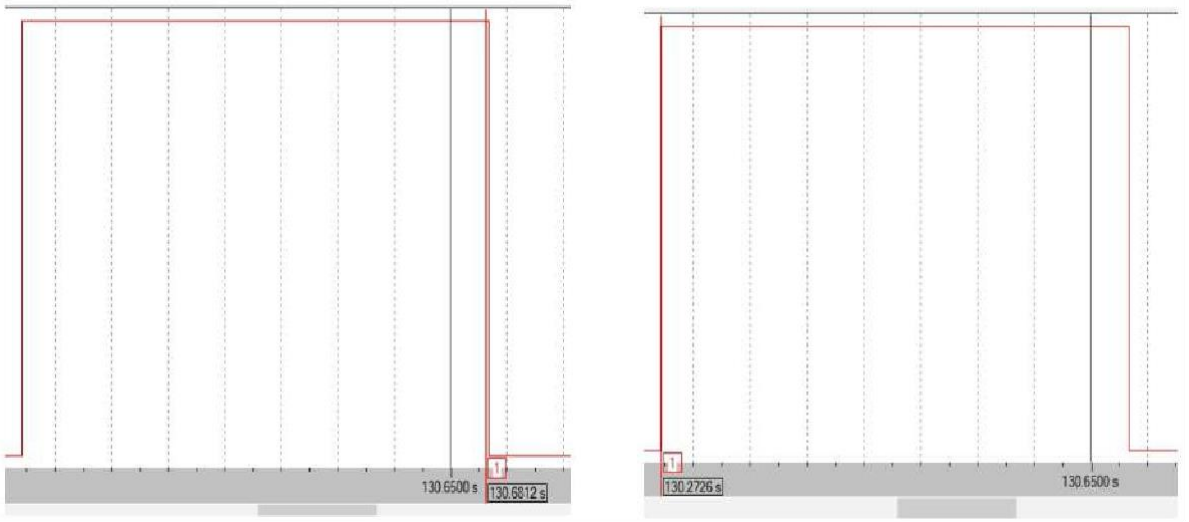
OUTPUT:





SQUARE WAVEFORM WITH TIME DELAY OF 405.2MS





Time delay between ON and OFF condition is : 405.2 ms

THE END