

```

#define W_R_LED 5
#define W_Y_LED 6
#define W_G_LED 7
#define WEST_Button 11

#define S_R_LED 2
#define S_Y_LED 3
#define S_G_LED 4
#define SOUTH_Button 10

#define HM_G_LED 8
#define HM_R_LED 9
#define WALK_Button 12

#define goS      0
#define waitS    1
#define goW      2
#define waitW    3
#define sToHM    4
#define wToHM    5
#define goHM1    6
#define waitHM1  7
#define goHM2    8
#define waitHM2  9

struct State
{
    unsigned long ST_Out;    // 6-bit pattern to street
output
    unsigned long Time;      // delay in milli seconds
units
    unsigned long Next[8];   // next state for inputs
0,1,2,3,4,5,6,7

```

```
};
```

```
typedef const struct State SType;
```

```
SType FSM[10] =
```

```
{
```

```
    {B10000101, 2000, {0, 4, 1, 1, 0, 4, 1, 1}}, //
```

```
State0 = {goS, SToHM, waitS, waitS, goS, sToHM, waitS,  
waitS}
```

```
    {B10001001, 300, {2, 2, 2, 2, 2, 2, 2, 2}}, //
```

```
State1 = {goW, goW, goW, goW, goW, goW, goW, goW}
```

```
    {B00110001, 2000, {2, 5, 2, 5, 3, 5, 3, 5}}, //
```

```
State2 = {goW, wToHM, goW, wToHM, waitW, wToHM, waitW,  
wToHM}
```

```
    {B01010001, 300, {0, 0, 0, 0, 0, 0, 0, 0}}, //
```

```
State3 = {goS, goS, goS, goS, goS, goS, goS, goS}
```

```
    {B10001001, 300, {6, 6, 6, 6, 6, 6, 6, 6}}, //
```

```
State4 = {goHM1, goHM1, goHM1, goHM1, goHM1, goHM1,  
goHM1, goHM1}
```

```
    {B01010001, 300, {6, 6, 6, 6, 6, 6, 6, 6}}, //
```

```
State5 = {goHM1, goHM1, goHM1, goHM1, goHM1, goHM1,  
goHM1, goHM1}
```

```
    {B10010010, 300, {6, 6, 7, 7, 7, 7, 7, 7}}, //
```

```
State6 = {goHM1, goHM1, waitHM1, waitHM1, waitHM1,  
waitHM1, waitHM1, waitHM1}
```

```
    {B10010000, 300, {8, 8, 8, 8, 8, 8, 8, 8}}, //
```

```
State7 = {goHM2, goHM2, goHM2, goHM2, goHM2, goHM2,  
goHM2, goHM2}
```

```
    {B10010010, 300, {9, 9, 9, 9, 9, 9, 9, 9}}, //
```

```
State8 = {waitHM2, waitHM2, waitHM2, waitHM2, waitHM2,  
waitHM2, waitHM2, waitHM2}
```

```
    {B10010000, 300, {6, 6, 2, 2, 0, 0, 2, 0}} //
```

```
State9 = {goHM1, goHM1, goW, goW, goS, goS, goW, goS}
```

```
};
```

```
unsigned long S = 0;
```

```
void setup()
```

```
{
```

```
    Serial.begin(9600);
```

```
    pinMode(W_R_LED, OUTPUT);
```

```
    pinMode(W_Y_LED, OUTPUT);
```

```
    pinMode(W_G_LED, OUTPUT);
```

```
    pinMode(WEST_Button, INPUT_PULLUP);
```

```
    pinMode(S_R_LED, OUTPUT);
```

```
    pinMode(S_Y_LED, OUTPUT);
```

```
    pinMode(S_G_LED, OUTPUT);
```

```
    pinMode(SOUTH_Button, INPUT_PULLUP);
```

```
    pinMode(HM_G_LED, OUTPUT);
```

```
    pinMode(HM_R_LED, OUTPUT);
```

```
    pinMode(WALK_Button, INPUT_PULLUP);
```

```
}
```

```
int input, input1, input2, input3;
```

```
void loop()
```

```
{
```

```
    digitalWrite(W_R_LED, (FSM[S].ST_Out & B10000000));
```

```
    digitalWrite(W_Y_LED, (FSM[S].ST_Out & B01000000));
```

```
    digitalWrite(W_G_LED, (FSM[S].ST_Out & B00100000));
```

```
    digitalWrite(S_R_LED, (FSM[S].ST_Out & B00010000));
```

```
    digitalWrite(S_Y_LED, (FSM[S].ST_Out & B00001000));
```

```
    digitalWrite(S_G_LED, (FSM[S].ST_Out & B00000100));
```

```
digitalWrite(HM_G_LED, (FSM[S].ST_Out & B00000010));  
digitalWrite(HM_R_LED, (FSM[S].ST_Out & B00000001));  
  
delay(FSM[S].Time);  
  
input1 = !digitalRead(SOUTH_Button);  
input2 = !digitalRead(WEST_Button);  
input3 = !digitalRead(WALK_Button);  
  
input = 4 * input2 + 2 * input1 + input3;  
S = FSM[S].Next[input];  
}
```