//Density Based 4 Way Traffic Light Control System

.INCLUDE "M32DEF.INC"

CBI DDRA,0 // pa0 configured as input

CBI DDRA,1 // pa1 //

CBI DDRA,2 // pa2 //

CBI DDRA,3 // pa3 //

SBI DDRC,0 // pc0 configured as an output

SBI DDRC,1 // PC1 //

SBI DDRC,2 // PC2 //

SBI DDRC,3 // PC3 //

SBI DDRC,4 // PC4 //

SBI DDRC,5 // PC5 //

SBI DDRD,0 //PD0 //

SBI DDRD,1 // PD1 //

SBI DDRD,2 //PD2 //

SBI DDRD,3 //PD3 //

SBI DDRD,4 //PD4 //

SBI DDRD,5 //PD5 //

LDI R16,0X00

OUT PORTC,R16

OUT PORTD,R16

LOOP1: // LOOP FOR ROOT1

SBIS PINA,0 // IF PINA HAS 1 THEN SKIP NEXT INSTRUCTION

JMP LOOP2

SBI PORTC,2 // GREEN1 LIGHT ON

SBI PORTC,4 // YELLOW 2 //

SBI PORTD,5// RED 3//

SBI PORTD,2 // RED4 //

CALL DelayMEGA

LDI R16,0X00

OUT PORTC,R16

OUT PORTD,R16

JMP LOOP1

LOOP2: // LOOP FOR ROOT2

SBIS PINA,1 //PA1

JMP LOOP3

SBI PORTC,0 //RED1 LIGHT ONN

SBI PORTC,5 //GREEN2 //

SBI PORTD,4 //YELLOW5 //

SBI PORTD,2 //RED4 //

CALL DelayMEGA

LDI R16,0X00

OUT PORTC,R16

OUT PORTD,R16

JMP LOOP2

LOOP3: // LOOP FOR ROOT3

SBIS PINA,2 //PA2

JMP LOOP4

SBI PORTC,0 // RED1

SBI PORTC,3 // RED2 //

SBI PORTD,3 //GREEN3 //

SBI PORTD,1 // YELLOW4 //

CALL DelayMEGA

LDI R16,0X00

OUT PORTC,R16

OUT PORTD,R16

JMP LOOP3

LOOP4: // LOOP FOR ROOT4

SBIS PINA,3 // IF PA3 HAS=1 THEN SKIP NEXT INSTRUCTION

JMP NORMALDENSITY

SBI PORTC,1 //YELLOW1 //

SBI PORTC,3 //RED2 //

SBI PORTD,5 //RED3 /

SBI PORTD,0 //GREEN 4

CALL DelayMEGA

LDI R16,0X00

OUT PORTC,R16 // CLEARING PORTC

OUT PORTD,R16 // CLEARING PORTD

JMP LOOP4

NORMALDENSITY: // ROOTS FOR ALL ROOTS AFTER FIX DELAY

SBIC PINA,0

JMP NORMALDENSITY

SBI PORTC,2 // GREEN1 LIGHT ON

SBI PORTC,4 // YELLOW 2 //

SBI PORTD,5// RED 3//

SBI PORTD,2 // RED4 //

CALL DelayMEGA

CALL DelayMEGA

LDI R16,0X00

OUT PORTC,R16

OUT PORTD,R16

SBIC PINA,1 // IF PA1=0 THEN SKIP NEXT INSTRUCTION.

JMP NORMALDENSITY

SBI PORTC,0 //RED1 LIGHT ONN

SBI PORTC,5 //GREEN2 //

SBI PORTD,4 //YELLOW5 //

SBI PORTD,2 //RED4 //

CALL DelayMEGA

CALL DelayMEGA

LDI R16,0X00

OUT PORTC,R16

OUT PORTD,R16

SBIC PINA,2

JMP NORMALDENSITY

SBI PORTC,0 // RED1

SBI PORTC,3 // RED2 //

SBI PORTD,3 //GREEN3 //

SBI PORTD,1 // YELLOW4 //

CALL DelayMEGA

CALL DelayMEGA

LDI R16,0X00

OUT PORTC,R16

OUT PORTD,R16

SBIC PINA,3

JMP NORMALDENSITY

SBI PORTC,1 //YELLOW1 //

SBI PORTC,3 //RED2 //

SBI PORTD,5 //RED3 /

SBI PORTD,0 //GREEN 4

CALL DelayMEGA

LDI R16,0X00

OUT PORTC,R16 // CLEARING PORTC

OUT PORTD,R16 // CLEARING PORTD

CALL DelayMEGA

JMP LOOP1 //INFINITE LOOP

DelayMEGA: // function used for delay

ldi R18,byte3(11\* 1000 \* 100 / 5)

ldi R17,high(11\* 1000 \* 100 / 5)

ldi R16,low(11\* 1000 \* 100 / 5)

subi R16,1

sbci R17,0

sbci R18,0

brcc pc-3

ret