

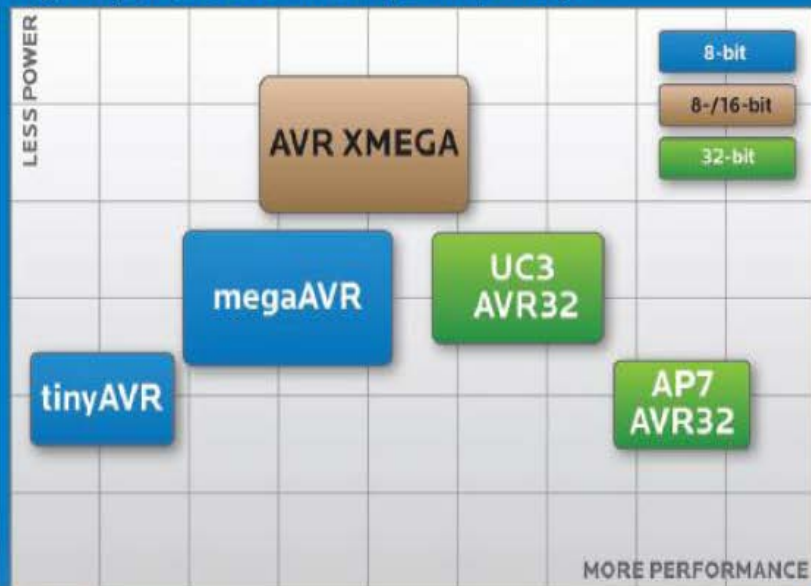
SISTEM MIKROPROSESOR DAN MIKROKONTROLER

4 SKS (3 TEORI & 1 PRAKTEK)
RUANGAN B2.2

JENIS-JENIS MIKROKONTROLER ATMEL

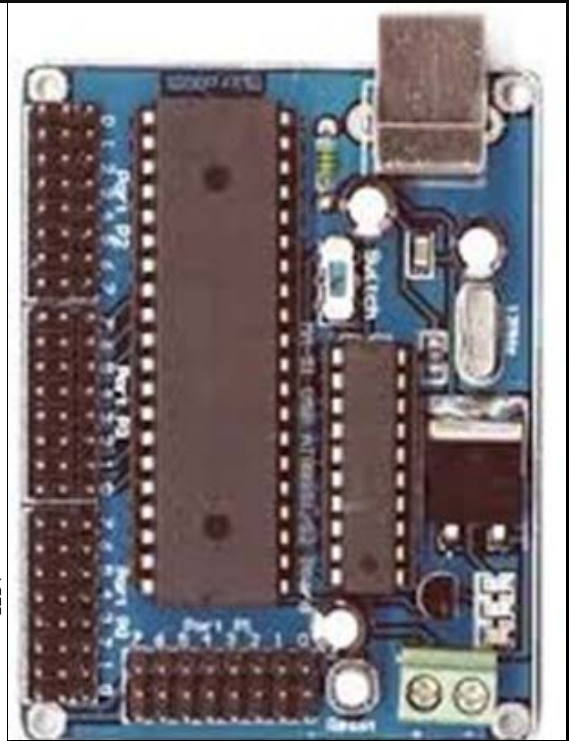
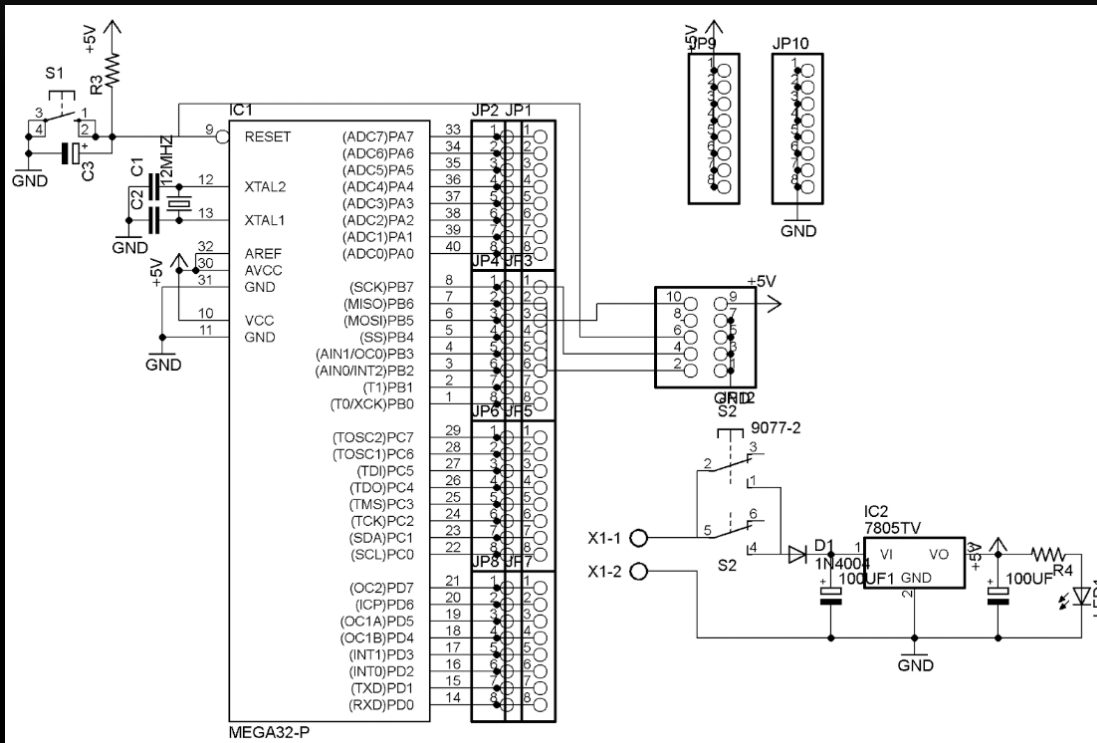
Atmel microcontrollers - success through innovation

Atmel offers both 8-bit and 32-bit AVR's, and since day one the AVR philosophy has always been clear: Highest performance with no power penalty.



- ▶ tinyAVR
1-16 KBytes Flash, 8-32 pin packages
- ▶ megaAVR
4-256 KBytes Flash, 28-100 pin packages
- ▶ AVR XMEGA
16-384 KBytes Flash, 44-100 pin packages
- ▶ AVR32 UC3
16-512 KBytes Flash, 48-144 pin packages
- ▶ AVR32 AP7
Up to 32 KBytes On-chip SRAM,
196-256 pin packages

MINIMUM SISTEM MIKROKONTROLLER



INPUT OUTPUT

	DDR bit = 1	DDR bit = 0
PORT bit =1	Output; High	Input; R pull-up
PORT bit=0	Output; Low	Input; Floating

Langkah yang diperhatikan adalah

- Pengaturan port yang akan digunakan (PORT A, B, C, atau D)
- Pengaturan Pin yang akan di gubkann (Pin 0 – 7)
- Pengaturan Pin sebagai input atau out put

Setingan awal

The screenshot shows the AVR Studio interface. On the left, the hardware configuration window is open to the 'Ports' tab, showing 'Port A' with bits 0 through 7 set to 'In' (Input). A red box highlights this configuration, and a red arrow points from it to the code in the 'Program Preview' window. The code shows the initialization of PORT A and DDRA to 0x00, which corresponds to the hardware configuration.

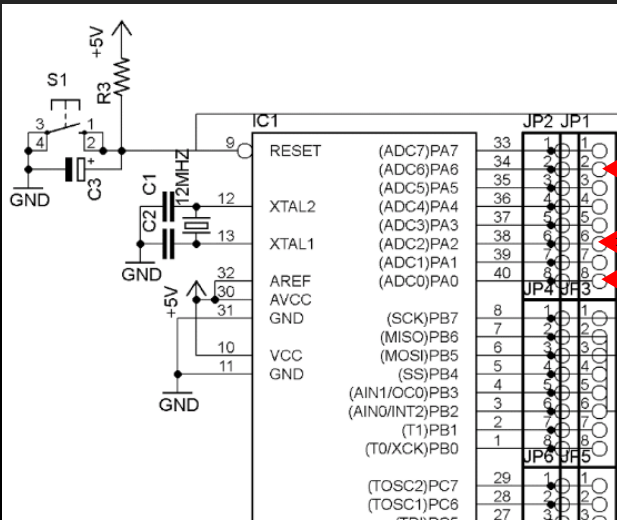
Port A	Port B	Port C	Port D
Bit 0 In			
Bit 1 In			
Bit 2 In			
Bit 3 In			
Bit 4 In			
Bit 5 In			
Bit 6 In			
Bit 7 In			

```
1 #include <megal6.h>
2
3 // Declare your global variables here
4
5 void main(void)
6 {
7 // Declare your local variables here
8
9 // Input/Output Ports initialization
10 // Port A initialization
11 // Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In Func0=In
12 // State7=T State6=T State5=T State4=T State3=T State2=T State1=T State0=T
13 PORTA=0x00;
14 DDRA=0x00;
15
16 // Port B initialization
17 // Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In Func0=In
18 // State7=T State6=T State5=T State4=T State3=T State2=T State1=T State0=T
19 PORTB=0x00;
20 DDRB=0x00;
```

Artinya PORT A

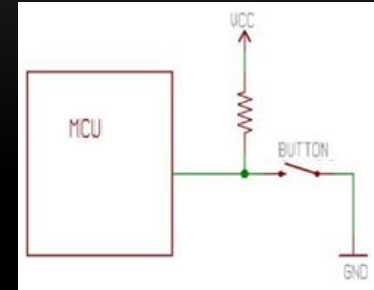
Pin 0 samapai deng pin 7 di seting sebagai input float

CONTOH



Penggunaan PORT A sebagai input

Input dari luar



Pin	Digit ke 4 - 5				Digit ke 0 - 3			
	P7	P6	P5	P4	P3	P2	P1	P0
PORTA	0	P	0	0	0	P	0	P
DDRA	0	0	0	0	0	0	0	0

Angka lima didapat dengan mengubah 0P0P menjadi 0101 = 5

P = 1

DDRA untuk setting input atau output
0 = input

Ket. Pada setingan DDRA 0x00 maka input yang di gunakan berupa float yang artinya bahwa saat inputan tidak di beri R pull up atau pull down maka nilai nya akan mengambang 1 atau 0

USART Analog Comparator ADC SPI
I2C 1 Wire 2 Wire (I2C)
LCD Bit-Banged Project Information
Chip Ports External IRQ Timers

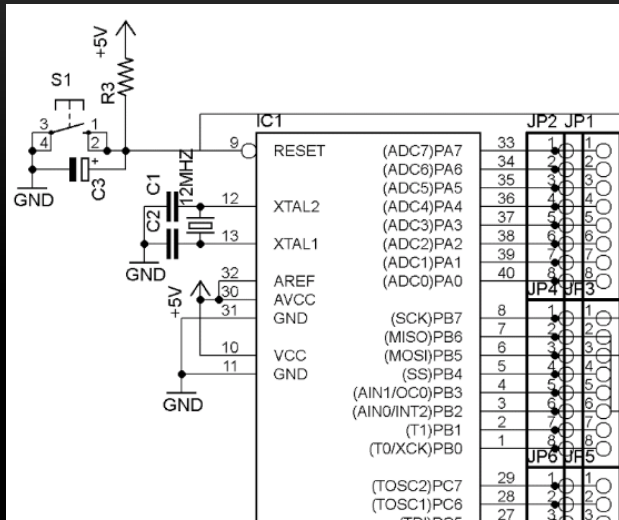
Port A	Port B	Port C	Port D
Data Direction			
Bit 0	In	P Bit 0	
Bit 1	In	T Bit 1	
Bit 2	In	P Bit 2	
Bit 3	In	T Bit 3	
Bit 4	In	T Bit 4	
Bit 5	In	T Bit 5	
Bit 6	In	P Bit 6	
Bit 7	In	T Bit 7	

Program Preview

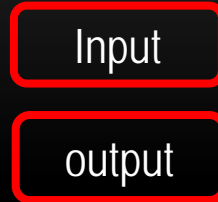
```

1 #include <mega16.h>
2
3 // Declare your global variables here
4
5 void main(void)
6 {
7 // Declare your local variables here
8
9 // Input/Output ports initialization
10 // Port A initialization
11 // Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In Func0=In
12 // State7=T State6=P State5=T State4=T State3=T State2=P State1=T State0=P
13 PORTA=0x45;
14 DDRA=0x00;
15
16 // Port B initialization
17 // Func7=In Func6=In Func5=In Func4=In Func3=In Func2=In Func1=In Func0=In
18 // State7=T State6=T State5=T State4=T State3=T State2=T State1=T State0=T
19 PORTB=0x00;
20 DDRE=0x00;
                
```


CONTOH



Penggunaan PORT A sebagai Output



Pin	Digit ke 4 - 5				Digit ke 0 - 3				Hex	Hex
	P7	P6	P5	P4	P3	P2	P1	P0		
PORTA	1	0	0	0	0	P	0	P	0x 8	5
DDRA	1	1	1	1	0	0	0	0	0x F	0

P = 1

DDRA untuk setting input atau output
0 = input

Ket. Pada setingan DDRA 0x00 maka input yang di gunakan berupa float yang artinya bahwa saat inputan tidak di beri R pull up atau pull down maka nilai nya akan mengambang 1 atau 0

Port A	Port B	Port C	Port D
Bit 0 In	P	Bit 0	}
Bit 1 In	T	Bit 1	
Bit 2 In	P	Bit 2	
Bit 3 In	T	Bit 3	
Bit 4 Out	0	Bit 4	}
Bit 5 Out	0	Bit 5	
Bit 6 Out	0	Bit 6	
Bit 7 Out	1	Bit 7	

```

4 // Declare your global variables here
5 void main(void)
6 {
7 // Declare your local variables here
8
9 // Input/Output Ports initialization
10 // Port A initialization
11 // Func7=Out Func6=Out Func5=Out Func4=Out Func3=Out
12 // State7=1 State6=0 State5=0 State4=0 State3=0
13 PORTA=0x85;
14 DDRA=0xF0;
15
16 // Port B initialization
17 // Func7=In Func6=In Func5=In Func4=In Func3=In
18 // State7=T State6=T State5=T State4=T State3=0
19 PORTB=0x00;
20 DDRB=0x00;
    
```

PROGRAM PADA CVAVR

```
103 MCUCR=0x00;
104 MCUCSR=0x00;
105
106 // Timer(s)/Counter(s) Interrupt(s) initialization
107 TIMSK=0x00;
108
109 // Analog Comparator initialization
110 // Analog Comparator: Off
111 // Analog Comparator Input Capture by Timer/Counter 1: Off
112 ACSR=0x80;
113 SFIOR=0x00;
114
115 while (1)
116 {
117
118     PORTC=0xFF;
119     delay_ms(500);
120
121 };
122
123
```

} Program Pada PORTC dengan output 1 (pin 0-7)
Dengan delay selama 500ms

```
if () {
};

if () {
}
...

do {
}
while ();

while () {
};

for (;;) {
};

switch () {
case :
...

switch () {
case :
```

Tugas Simulasikan pada proteus apa yang dihasilkan pada port tersebut?


```

104 MCUCSR=0x00;
105
106 // Timer(s)/Counter(s) Interrupt(s) initialization
107 TIMSK=0x00;
108
109 // Analog Comparator initialization
110 // Analog Comparator: Off
111 // Analog Comparator Input Capture by Timer/Counter 1: Off
112 ACSR=0x80;
113 SFIOR=0x00;
114
115 while (1)
116 {
117     PORTC=PINA;
118 }
119
120
121 }
122

```

} Program Pada PORTC sebagai input (pin 0-7)

Tugas Simulasikan pada proteus apa yang dihasilkan

```

if(PINA==0x01)
{
PORTC=0x18;
}

```

TERIMA KASIH

