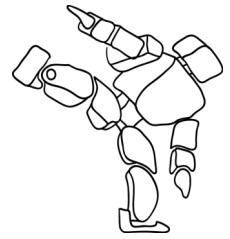


Programmeerimine C keeles AVR mikrokontrolleri baasil

Peeter Salong

Sisujuht



Analoog- ja digitaalsignaal

AVR mikrokontroller

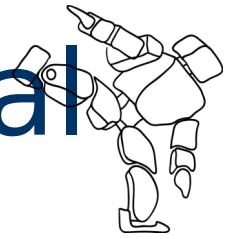
- Väljaviigud
- Digitaalne sisend/väljund
- Register

Programmeerimise erivõtted

- Üheks seadma
- Nullima
- Muutma



Analoog- ja digitaalsignaali

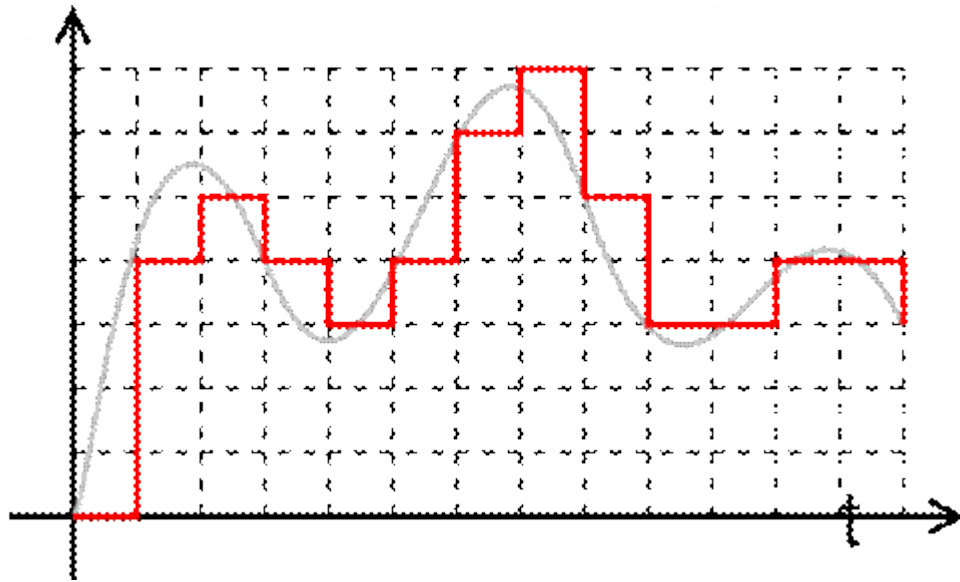
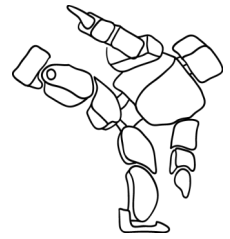


Analog Signal

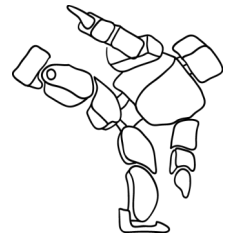


Digital Signal

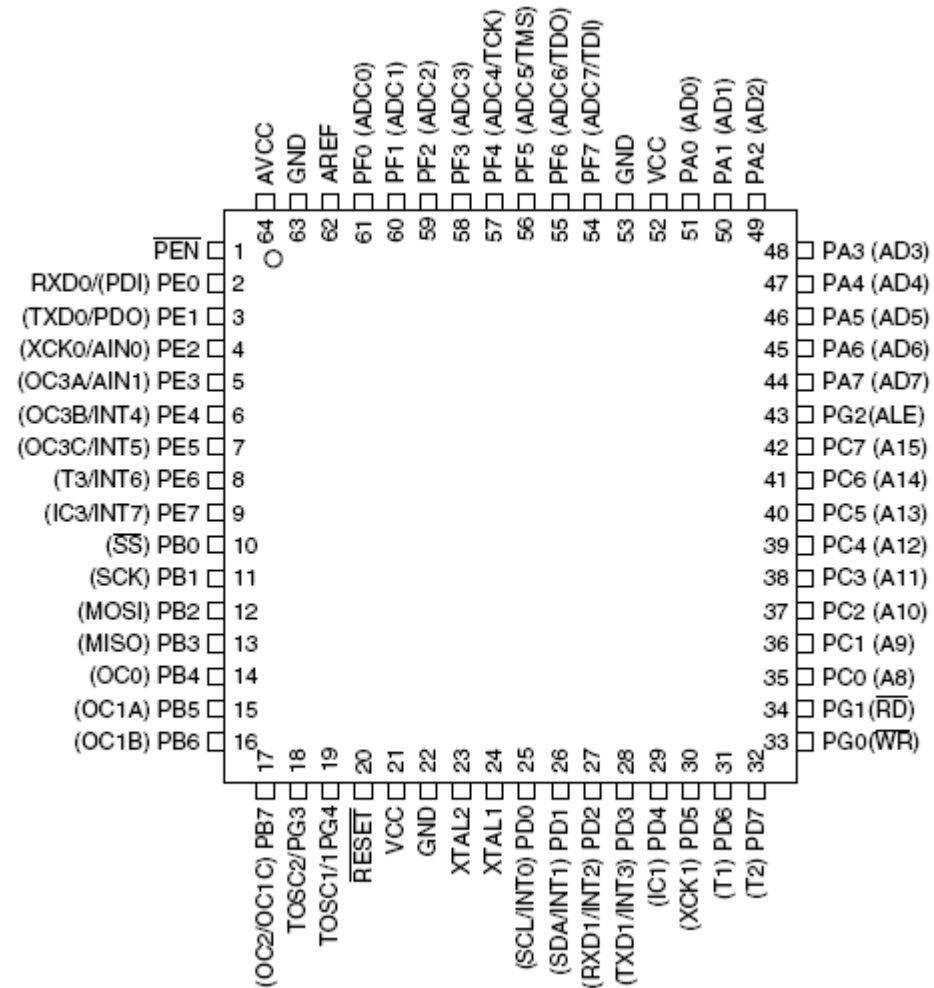
Analoogsignaali diskreetimine



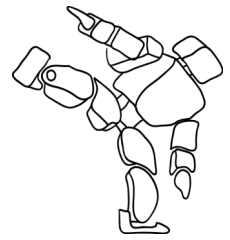
AVR mikrokontroller



Väljaviigud



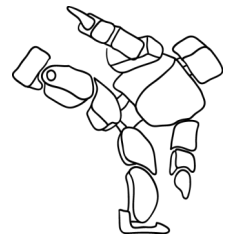
AVR mikrokontroller



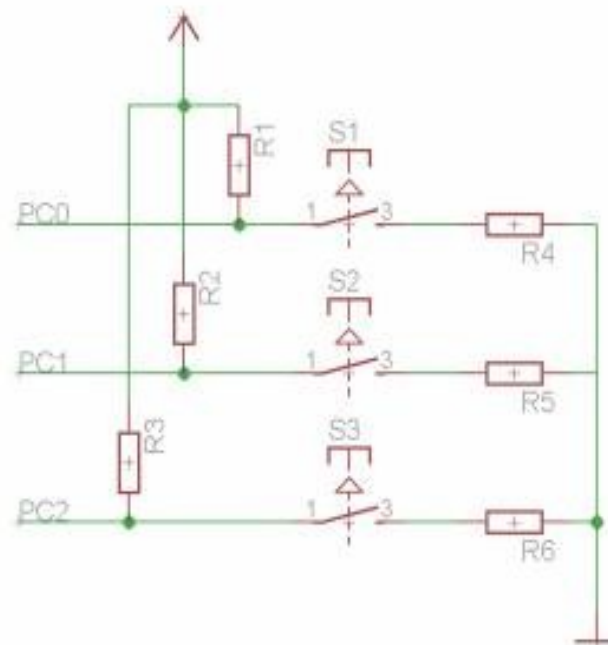
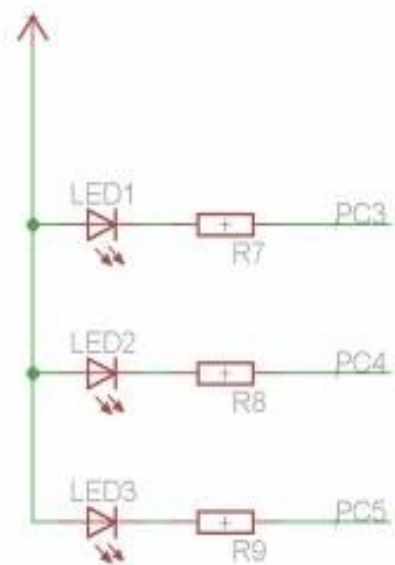
Digitaalne sisend/väljund

Viigud on mikrokontrolleri metallist kontaktid, kõnekeeles jalad, mille kaudu saab edastada ja vastu võtta digitaalseid pingeväärtusi. Kui viik seadistada programmis sisendiks, saab selle kaudu mikrokontroller lugeda lülitite või muude lihtsamate andurite olekut. Kui viik seadistada väljundiks, saab selle kaudu süüdata valgusdioode või juhtida elektriseadmeid.

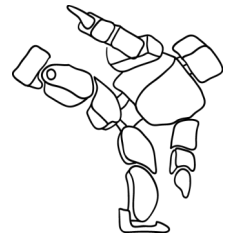
AVR mikrokontroller



LEDide ja lülitite elektriskeemid

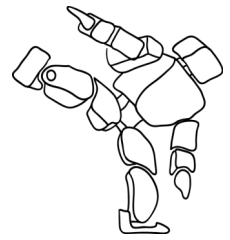


AVR mikrokontroller



C keele näide

Üheks seadma (set)



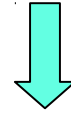
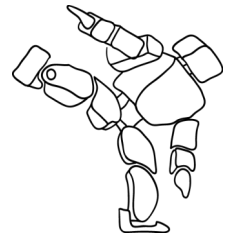
Pordi B andmesuunaregister DDRB

Bit	7	6	5	4	3	2	1	0	
	DDB7	DDB6	DDB5	DDB4	DDB3	DDB2	DDB1	DDB0	DDRB
Read/Write	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

A cyan arrow points upwards to the DDB2 bit in the Initial Value row, and another cyan arrow points downwards from the DDB0 bit in the Initial Value row towards the code below.

```
char test = 0x22; // 0010 0010
test = test | 0x04; // 0010 0110
```

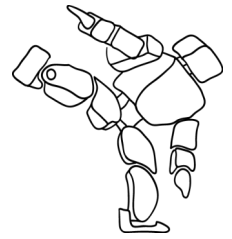
Nullima (clear)



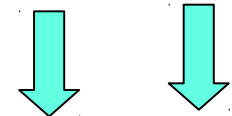
```
char test = 0x22; // 0010 0010  
test = test & ~0x20; // 0000 0010  
(test = test & 0xDF;)
```



Muutma (toggle)



```
char test = 0x22; // 0010 0010
test = test ^ 0x28; // 0000 1010
```



Tänan!

