
10. HAFTA

BLM320

# BİLGİSAYAR MİMARİSİ

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# 10. Temel Bilgisayar Simulatörü

```
#include<stdio.h>
#include<conio.h>
//#include<iostream.h>
#include<string.h>
#include<stdlib.h>
typedef unsigned int word;
typedef unsigned char byte;

word M[4096];
word PC;
word AR;
word DR;
word TR;
byte OUTR;
byte INPR;
byte SC;
byte S;
byte R;
byte IEN;
byte FGI;
byte FGO;
byte D[8];
byte T[8];
byte B[12];
byte I,II,RR,r,p,E,D7,T0,T1,T2;

union {
struct {
        unsigned b0:1;unsigned b1:1;unsigned b2:1;unsigned b3:1;
        unsigned b4:1;unsigned b5:1;unsigned b6:1;unsigned b7:1;
        unsigned b8:1;unsigned b9:1;unsigned b10:1;unsigned b11:1;
        unsigned opr:3;
        unsigned I:1;
    }b;
unsigned ar:12;
unsigned deg;
}IR;

union {
struct {
```

```
        unsigned b0:1;
        unsigned x:14;
        unsigned b15:1;
    }b;
unsigned char acl:8;
unsigned deg;
unsigned long t;
}AC;



 void yukle(void)
 {
 char ch;
 unsigned int veri;
 system("cls");
 tekrar:
 printf("Program baslangic adresini giriniz :");
 scanf("%x",&veri);
 AR=veri;
 if(AR>4095 || AR<0) {printf("HATA\n"); goto tekrar;}
 while(1)
 {printf("%X:",AR);
  scanf("%x",&veri);
  M[AR]=veri;
  AR=AR+1;
  if(veri==1) break;
  }
 }

//Belleği görüntüle
 void dump(void)
 {
 char j,k;
 unsigned int veri;
 unsigned adres;

 system("cls");
 tekrar:
 printf("Program baslangic adresini giriniz :");
 scanf("%x",&veri);
 adres=veri;
 if(adres>4095 || adres<0) {printf("HATA\n"); goto tekrar;}
```

```
for(k=0;k<20;k++){
printf("%X:",adres);

for(j=0;j<10;j++){
printf("%04X ",M[adres]);
adres++;
if(j==9) printf("\n");
}
}
// getch();
}



void execute(void)
{ unsigned char j,ch;
  unsigned int adres;
  unsigned long top;
  unsigned int veri;
  int aaaa;

AR=0;
DR=0;
AC.deg=0;
TR=0;
OUTR=0;
INPR=0;
IR.deg=0;
OUTR=0;
INPR=0;
SC=0;
R=0;
IEN=0;
FGI=0;
FGO=0;
E=0;
S=1;
system("cls");
tekrar:
printf("Program baslangic adresini giriniz :");
scanf("%X",&veri);
adres=veri;
if(adres>4095 || adres<0) {printf("HATA\n"); goto tekrar;}
```

```
PC=adres;
//if(adres>4095) exit(1);

while(S==1)
{

for(j=0;j<8;j++){
  if(j==SC) T[j]=1;else T[j]=0;
  }
/*----------Fetch komut kodunu hafizaya alma evresi-----*/
RR=!R;
if(RR*T[0]==1) AR=PC;
if(RR*T[1]==1) {IR.deg=M[AR];PC=PC+1;}
/*---------Decode--------------------------------------*/
if(RR*T[2]==1){
for(j=0;j<8;j++){ if(j==IR.b.opr) D[j]=1; else D[j]=0;}
AR=IR.ar;
I=IR.b.I;
}
/*---------indirect evresi-----------------------------*/
//I=IR.b.I;
D7=!D[7];
if(D7*I*T[3]==1) AR=M[AR];
/*---------interrupt evresi--------*/
T0=!T[0];T1=!T[1]; T2=!T[2];
//if(T0*T1*T2*IEN==1 && (FGI || FGO)==1) R=1;
  if(T0*T1*T2*IEN*FGI==1 || T0*T1*T2*IEN*FGO==1) R=1;
if(R*T[0]==1) {AR=0;TR=PC;}
if(R*T[1]==1) {M[AR]=TR;PC=0;}
if(R*T[2]==1) {PC=PC+1;IEN=0;R=0;}
/*-----------------memory reference instruction-------*/
/*AND*/
if(D[0]*T[4]==1) DR=M[AR];
if(D[0]*T[5]==1) {AC.deg=AC.deg & DR;}
/*ADD*/
if(D[1]*T[4]==1) DR=M[AR];
if(D[1]*T[5]==1) {AC.t=AC.deg+DR;if(AC.t>65535) E=1;else E=0;}
/*LDA*/
if(D[2]*T[4]==1) DR=M[AR];
if(D[2]*T[5]==1) {AC.deg=DR;}
/*STA*/
if(D[3]*T[4]==1) {M[AR]=AC.deg;}
```

```
/*BUN*/
if(D[4]*T[4]==1) {PC=AR;}
/*BSA*/
if(D[5]*T[4]==1) {M[AR]=PC;AR=AR+1;}
if(D[5]*T[5]==1) {PC=AR;}
/*ISZ*/
if(D[6]*T[4]==1) DR=M[AR];
if(D[6]*T[5]==1) DR=DR+1;
if(D[6]*T[6]==1) {M[AR]=DR;if(DR==0)PC=PC+1;}
/*-----register refererece instruction-----*/
II=!IR.b.I;
r=D[7]*II*T[3];
B[0]=IR.b.b0;B[1]=IR.b.b1;B[2]=IR.b.b2;B[3]=IR.b.b3;B[4]=IR.b.b4;B[5]=IR.b.b5;
B[6]=IR.b.b6;B[7]=IR.b.b7;B[8]=IR.b.b8;B[9]=IR.b.b9;B[10]=IR.b.b10;B[11]=IR.b.b11;

/*CLA*/
if(r*B[11]==1) AC.deg=0;
/*CLE*/
if(r*B[10]==1) E=0;
/*CMA*/
if(r*B[9]==1) {AC.deg=~AC.deg;}
/*CME*/
if(r*B[8]==1) E=!E;
/*CIR */
if(r*B[7]==1) {AC.b.b15=E; E=AC.b.b0;AC.deg=AC.deg>>1;}
/*CIL*/
if(r*B[6]==1) {AC.b.b0=E; E=AC.b.b15;AC.deg=AC.deg<<1;}
/*INC*/
if(r*B[5]==1) AC.t=AC.deg+1;
/*SPA*/
if(r*B[4]==1) if(AC.b.b15==0) PC=PC+1;
/*SNA*/
if(r*B[3]==1) if(AC.b.b15==1) PC=PC+1;
/*SZA*/
if(r*B[2]==1) if(AC.deg==0) PC=PC+1;
/*SZE*/
if(r*B[1]==1) if(E==0) PC=PC+1;
/*HLT*/
if(r*B[0]==1) {S=0;goto son;}
/*------------input/output--------------*/
I=IR.b.I;p=D[7]*I*T[3];
/*INP*/
if(p*B[11]==1) AC.acl=INPR;FGI=0;
```

```
/*OUT*/
if(p*B[10]==1) OUTR=AC.acl;FGO=0;
/*SKI*/
if(p*B[9]==1)  if(FGI==1) PC=PC+1;
/*SKO*/
if(p*B[8]==1)  if(FGO==0) PC=PC+1;
/*ION*/
if(p*B[7]==1)  IEN=1;
/*IOF*/
if(p*B[6]==1)  IEN=0;
//if(p==1) SC=0;

if(SC<7) SC++;else SC=0;
if(SC==0){
printf("AC:%x AR:%x DR:%x IR:%x PC:%x \n",AC.deg,AR,DR,IR.deg,PC);
ch=getch();
if(ch=='D' || ch=='d')  S=1;else S=0;
}

}//while
son:
aaaa=5;
}

main()
{
char sec;
unsigned int j;
FILE *f;
//yukle();
//dump();
//execute(0100);

for(j=0;j<4096;j++) M[j]=0;

while(1)
{
system("cls");
printf("******MENU*******\n");
printf("1.yeni program\n");
printf("2.kaydet\n");
printf("3.Dosyadan yukle\n");
printf("4.Memory goruntule\n");
```

```
printf("5.Calistir\n");
printf("6.Exit\n\n");
printf("Seciminiz :");
sec=getche();
printf("\n");

switch(sec)
{
case '1':yukle();break;
case '2':{
        printf("prog.txt dosyasina kaydediliyor. Lutfen bekleyiniz...\n");
        f=fopen("prog.txt","w");
        for(j=0;j<4096;j++) fprintf(f,"%d\n",M[j]);
        fclose(f);
        printf("Dosya kaydedildi\n");
        };break;
case '3':{
        printf("prog.txt dosyas◙ yukleniyor. Lutfen bekleyiniz...\n");
        f=fopen("prog.txt","r");
        for(j=0;j<4096;j++) fscanf(f,"%d",&M[j]);
        fclose(f);
        printf("Dosya yukleme tamam\n");
        };break;

case '4':dump();break;
case '5':execute();break;
case '6':exit(1);break;
}
getch();
}
/*
IR.deg=0x8800;
IR.b.opr=7;
IR.ar=0x008;
IR.b.I=0;
printf("%x %x %x %x %x %x\n",IR.deg,IR.b.I,IR.b.opr,IR.ar,IR.b.b11,IR.b.b0);
*/
getch();


return 0;
}
```