**Temel Bilgisayar Yazaçlarının bir Ortak Veri Yoluna Bağlanması**

**Basic computer registers connected to a common bus**

S0

S1

S2

Common

Bus

16

Memory Unit

Bellek Birimi

4096 x 16

16

7

Read

Address

Write



1

3

5

AR

12

12

LD INR CLR

PC

12

12

2



LD INR CLR



DR

16

16



16

LD INR CLR



LD INR CLR

16

E

ALU

4

AC



16



8

16

INPR

16

IR

LD



TR

16

16

6

LD INR CLR



8

CP

OUTR

LD

16 bitlik Ortak Veri Yolu

**Temel Bilgisayar için Denetim Fonksiyonları ve Mikroişlemler**

**Control functions and microoperations for the basic computer**

|  |  |  |
| --- | --- | --- |
| Fetch – Al Getir | R′ T0 : | AR ← PC |
| R′ T1 : | IR ← M[AR] , PC ← PC + 1 |
| Decode – Kod Çöz | R′ T2 : | I ← IR(15) , D7 … D0 ← Decode IR (14-12) , AR ← IR(11-0) |
| Indirect – Dolaylı | D7′ I T3 : | AR ← M[AR] |
| Interrupt – Kesme | | |
| RT0 : | AR ← 0 , TR ← PC | |
| RT1 : | M[AR] ← TR , PC ← 0 | |
| RT2 : | PC ← PC + 1 , IEN ← 0 , R ← 0 , SC ← 0 | |
| Memory Reference Instructions – Bellek Adreslemeli Buyruklar | | |
| AND | D0T4 : | DR ← M[AR] |
| D0T5 : | AC ← AC ∧ DR , SC ← 0 |
| ADD | D1T4 : | DR ← M[AR] |
| D1T5 : | AC ← AC + DR , E ← Cout , SC ← 0 |
| LDA | D2T4 : | DR ← M[AR] |
| D2T5 : | AC ← DR , SC ← 0 |
| STA | D3T4 : | M[AR] ← AC, SC ← 0 |
| BUN | D4T4 : | PC ← AR , SC ← 0 |
| BSA | D5T4 : | M[AR] ← PC , AR ← AR + 1 |
| D5T5 : | PC ← AR , SC ← 0 |
| ISZ | D6T4 : | DR ← M[AR] |
| D6T5 : | DR ← DR + 1 |
| D6T6 : | M[AR] ← DR , If DR = 0 then PC ← PC + 1 , SC ← 0 |
| Register Reference Instructions – Yazaç Adreslemeli Buyruklar | | |
| D7 I′ T3 = r , IR(i) = Bi ( i = 0 , 1 , 2 , … , 11 ) | | |
|  | r : | SC ← 0 |
| CLA | rB11 : | AC ← 0 |
| CLE | rB10 : | E ← 0 |
| CMA | rB9 : | AC ← AC′ |
| CME | rB8 : | E ← E′ |
| CIR | rB7 : | AC ← shr AC , AC(15) ← E , E ← AC(0) |
| CIL | rB6 : | AC ← shl AC , AC(0) ← E , E ← AC(15) |
| INC | rB5 : | AC ← AC + 1 |
| SPA | rB4 : | If AC(15) = 0 then PC ← PC + 1 |
| SNA | rB3 : | If AC(15) = 1 then PC ← PC + 1 |
| SZA | rB2 : | If AC = 0 then PC ← PC + 1 |
| SZE | rB1 : | If E = 0 then PC ← PC + 1 |
| HLT | rB0 : | S ← 0 |
| Input Output Instructions – Giriş Çıkış Buyrukları | | |
| D7 I T3 = p , IR(i) = Bi ( i = 6, 7, 8, 9, 10, 11 ) | | |
|  | p : | SC ← 0 |
| INP | pB11 : | AC (7-0) ← INPR , FGI ← 0 |
| OUT | pB10 : | OUTR ← AC (7-0) , FG0 ← 0 |
| SKI | pB9 : | If FGI = 1 then PC ← PC + 1 |
| SKO | pB8 : | If FGO = 1 then PC ← PC + 1 |
| ION | pB7 : | IEN ← 1 |
| IOF | pB6 : | IEN ← 0 |