EOB127-Sayısal Elektronik

5.Hafta Sunum - Bileşik Mantık İfadelerinde Fark Etmez Durumlar

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Bu Hafta Anlatılacak Konu Başlıkları

- Fark etmez durumların oluşumu
- Sadeleştirme işleminde sağladıkları kolaylıklar
- Örnek Uygulama

Fark Etmez Durumların Oluşumu

- Sayısal sistemlerde n adet bit sayısı ile oluşabilecek durum sayısı;
  $Durum\ Sayısı = 2^n$ şeklinde verilir.

- Tasarlanan bileşik mantık devresinde gerekli olan durum sayısı ikinin tam kuvveti olmayabilir.

- Bu durumda tasarımda kullanılmayan durumlar meydana gelecektir. Bu durumlar mantık devresinin çalışması esnasında hiçbir zaman çalışmayacağı düşünülerek **fark etmez** durumunu oluşturur ve sembol olarak **X** kullanılır.

Sadeleştirme işleminde sağladıkları kolaylıklar

- Tasarlanan bileşik mantık devresinde fark etmez durum olması, bu durumların sadeleştirmede istediğimiz dijital değeri verebileceğimiz anlamını taşır.

- Bu durumu bir örnek uygulama üzerinde anlatalım. Örneğimizde 4 bit iki tabanındaki sayının değerini ortak anotlu displayde gösteren BCD kod çözücü devresini tasarlayalım.

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

AB\CD	00	01	11	10
00	0	1	0	0
01	1	0	0	0
11	X	X	X	X
10	0	0	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

AB\CD	00	01	11	10
00	0	**1**	0	0
01	1	0	0	0
11	X	X	X	X
10	0	0	X	X

Fa(A,B,C,D)= **A'.B'.C'.D**

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

AB\CD	00	01	11	10
00	0	**1**	0	0
01	**1**	0	0	0
11	**X**	X	X	X
10	0	0	X	X

Fa(A,B,C,D)= **A’.B’.C’.D** + **B.C’D’**

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

AB\CD	00	01	11	10
00	0	0	0	0
01	0	1	0	1
11	X	X	X	X
10	0	0	X	X

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

AB\CD	00	01	11	10
00	0	0	0	0
01	0	**1**	0	1
11	X	**X**	X	X
10	0	0	X	X

Fb(A,B,C,D)= **B.C’.D**

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

AB\CD	00	01	11	10
00	0	0	0	0
01	0	**1**	0	**1**
11	X	**X**	X	**X**
10	0	0	X	X

Fb(A,B,C,D)= **B.C’.D** + **B.C.D’**

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A'.B'.C'.D + B.C'D'

Fb(A,B,C,D)= B.C'.D + B.C.D'

AB\CD	00	01	11	10
00	0	0	0	1
01	0	0	0	0
11	X	X	X	X
10	0	0	X	X

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

AB\CD	00	01	11	10
00	0	0	0	**1**
01	0	0	0	0
11	X	X	X	X
10	0	0	X	**X**

Fc(A,B,C,D)=**B’.C.D’**

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

AB\CD	00	01	11	10
00	0	1	0	0
01	1	0	1	0
11	X	X	X	X
10	0	0	X	X

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

AB\CD	00	01	11	10
00	0	**1**	0	0
01	1	0	1	0
11	X	X	X	X
10	0	0	X	X

Fd(A,B,C,D)= **A’.B’.C’.D**

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

AB\CD	00	01	11	10
00	0	**1**	0	0
01	**1**	0	1	0
11	**X**	X	X	X
10	0	0	X	X

Fd(A,B,C,D)= **A’.B’.C’.D** + **B.C’.D’**

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A'.B'.C'.D + B.C'D'

Fb(A,B,C,D)= B.C'.D + B.C.D'

Fc(A,B,C,D)=B'.C.D'

AB\CD	00	01	11	10
00	0	**1**	0	0
01	**1**	0	**1**	0
11	**X**	X	**X**	X
10	0	0	X	X

Fd(A,B,C,D)= **A'.B'.C'.D** + **B.C'.D'** + **B.C.D**

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

AB\CD	00	01	11	10
00	0	1	1	0
01	1	1	1	0
11	X	X	X	X
10	0	1	X	X

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

AB\CD	00	01	11	10
00	0	**1**	**1**	0
01	1	**1**	**1**	0
11	X	**X**	**X**	X
10	0	**1**	**X**	X

Fe(A,B,C,D)=**D**

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

AB\CD	00	01	11	10
00	0	**1**	**1**	0
01	1	**1**	**1**	0
11	X	**X**	**X**	X
10	0	**1**	**X**	X

Fe(A,B,C,D)=**D** + **B.C’**

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

Fe(A,B,C,D)=D + B.C’

AB\CD	00	01	11	10
00	0	1	1	1
01	0	0	1	0
11	X	X	X	X
10	0	0	X	X

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

Fe(A,B,C,D)=D + B.C’

AB\CD	00	01	11	10
00	0	1	**1**	1
01	0	0	**1**	0
11	X	X	**X**	X
10	0	0	**X**	X

Ff(A,B,C,D)=**C.D**

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

Fe(A,B,C,D)=D + B.C’

AB\CD	00	01	11	10
00	0	1	**1**	**1**
01	0	0	**1**	0
11	X	X	**X**	X
10	0	0	**X**	**X**

Ff(A,B,C,D)=**C.D** + **B’.C**

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

Fe(A,B,C,D)=D + B.C’

AB\CD	00	01	11	10
00	0	**1**	**1**	**1**
01	0	0	**1**	0
11	X	X	**X**	X
10	0	0	**X**	**X**

Ff(A,B,C,D)=**C.D** + **B’.C** + **A’.B’.D**

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

Fe(A,B,C,D)=D + B.C’

Ff(A,B,C,D)=C.D + B’.C + A’.B’.D

AB\CD	00	01	11	10
00	1	1	0	0
01	0	0	1	0
11	X	X	X	X
10	0	0	X	X

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Fa(A,B,C,D)= A’.B’.C’.D + B.C’D’

Fb(A,B,C,D)= B.C’.D + B.C.D’

Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= A’.B’.C’.D + B.C’.D’ + B.C.D

Fe(A,B,C,D)=D + B.C’

Ff(A,B,C,D)=C.D + B’.C + A’.B’.D

AB\CD	00	01	11	10
00	**1**	**1**	0	0
01	0	0	1	0
11	X	X	X	X
10	0	0	X	X

Fg(A,B,C,D)= **A’.B’.C’**

Örnek Uygulama: Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= A'.B'.C'.D + B.C'D'

Fb(A,B,C,D)= B.C'.D + B.C.D'

Fc(A,B,C,D)=B'.C.D'

Fd(A,B,C,D)= A'.B'.C'.D + B.C'.D' + B.C.D

Fe(A,B,C,D)=D + B.C'

Ff(A,B,C,D)=C.D + B'.C + A'.B'.D

AB\CD	00	01	11	10
00	**1**	**1**	0	0
01	0	0	**1**	0
11	X	X	**X**	X
10	0	0	X	X

Fg(A,B,C,D)= **A'.B'.C'** + **B.C.D**

No	A	B	C	D	a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
A	1	0	1	0	X	X	X	X	X	X	X
b	1	0	1	1	X	X	X	X	X	X	X
C	1	1	0	0	X	X	X	X	X	X	X
d	1	1	0	1	X	X	X	X	X	X	X
E	1	1	1	0	X	X	X	X	X	X	X
F	1	1	1	1	X	X	X	X	X	X	X

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= **A'.B'.C'.D** + **B.C'D'**

Fb(A,B,C,D)= B.C'.D + B.C.D'

Fc(A,B,C,D)=B'.C.D'

Fd(A,B,C,D)= **A'.B'.C'.D** + **B.C'.D'** + **B.C.D**

Fe(A,B,C,D)=D + B.C'

Ff(A,B,C,D)=C.D + B'.C + A'.B'.D

Fg(A,B,C,D)= A'.B'.C' + **B.C.D**

Örnek Uygulama:
Ortak Anotlu BCD Kod Çözücü

Fa(A,B,C,D)= **A’.B’.C’.D** + **B.C’D’**

Fb(A,B,C,D)= B.C’.D + B.C.D’

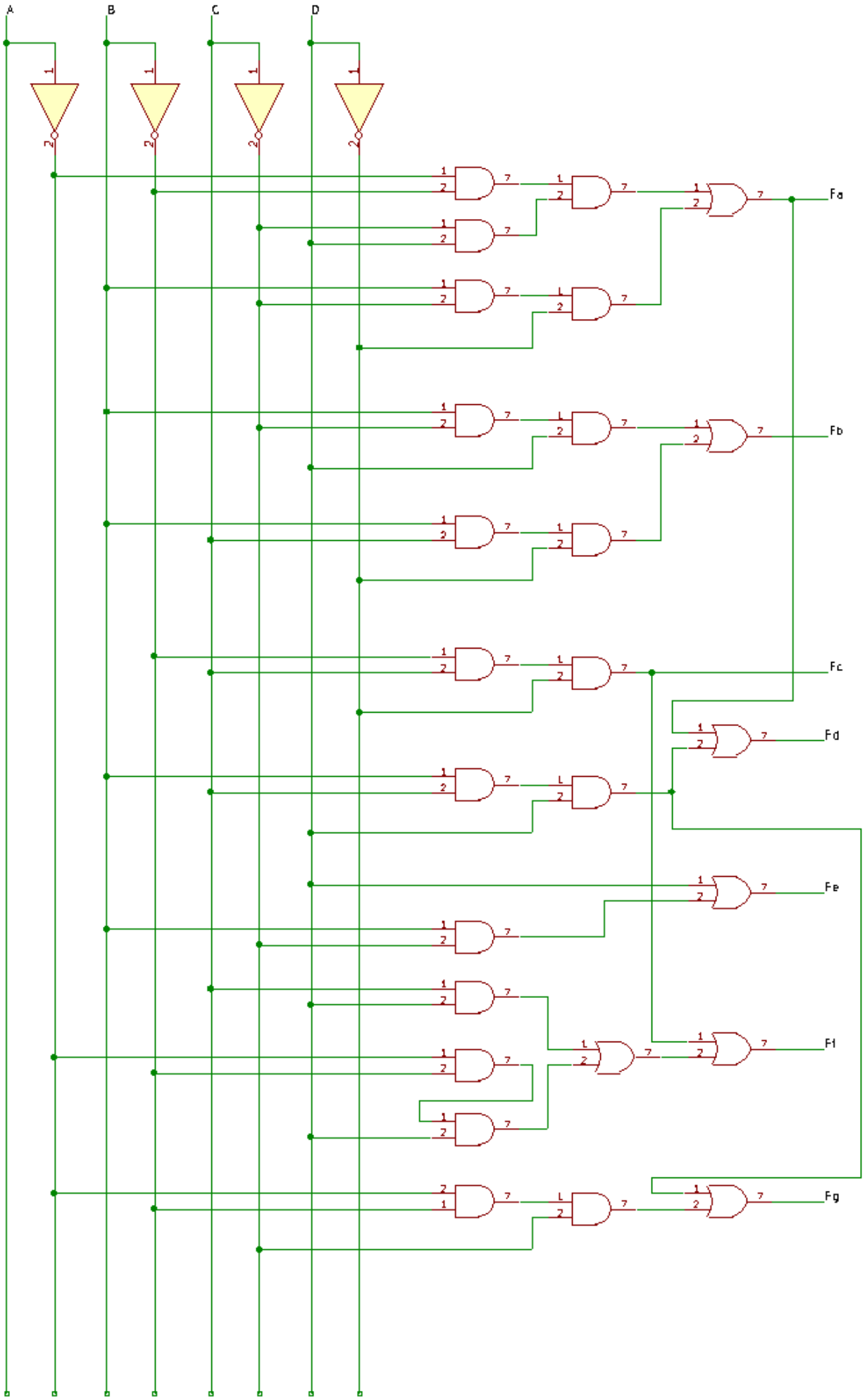
Fc(A,B,C,D)=B’.C.D’

Fd(A,B,C,D)= Fa(A,B,C,D) + **B.C.D**

Fe(A,B,C,D)=D + B.C’

Ff(A,B,C,D)=C.D + B’.C + A’.B’.D

Fg(A,B,C,D)= A’.B’.C’ + **B.C.D**


A
B
C
D
Fa
Fb
Fc
Fd
Fe
Ff
Fg

Dersimiz Burada Bitmiştir

Bu haftaya yönelik çalışma sorularını çözmeyi unutmayın.

Referans Kitap: Sayısal Tasarım M.Morris Mano