1. Ekspandirajmo po Shannonovom teoremu i varijabli x dokaži:

$$\boxed{f(x+y)+f(xy)} = f(x)+f(y)$$

$$x\cdot[f(1+y)+f(y)] + x'[f(y)+f(0)] =$$

(pozitivni kofaktor, umjesto $x \to 1$; umjesto $\bar{x} \to 0$ negativni kofaktor)

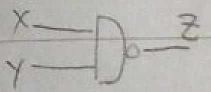
$$= x\cdot f(1) + x f(y) + x' f(y) + x' f(0) =$$

$$= \underbrace{x\cdot f(1) + x' f(0)}_{} + \underbrace{x f(y) + x' f(y)}_{} = \quad \leftarrow \text{Shannon}$$

$$= \quad f(x) \quad + \quad f(y)$$

- Blic: b, b, a, b, b, b, a, b, a, b

- NI (NAND) $\qquad NI(x,y) = ite(x, y', 1)$

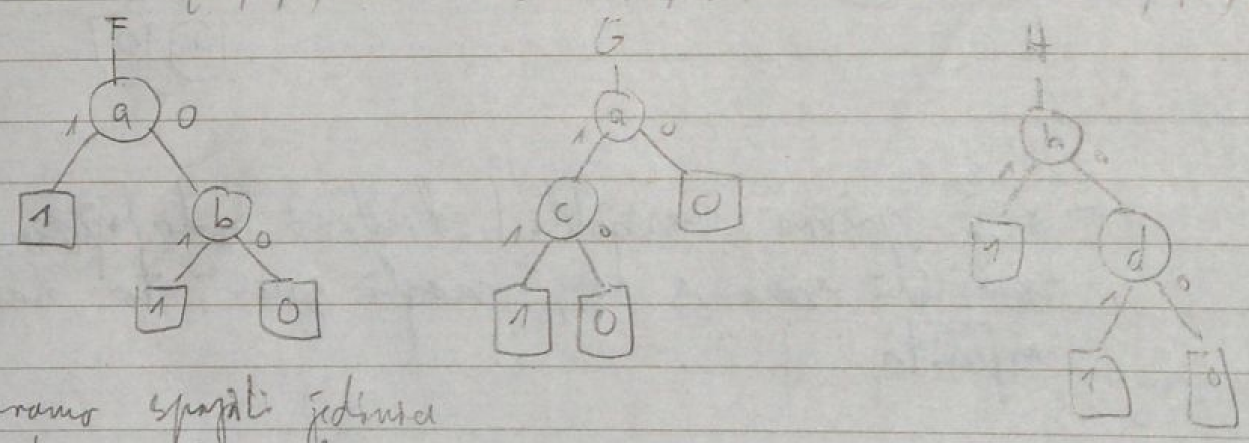


x y	z	
0 0	1	} x=0
0 1	1	
1 0	1	} x=1
1 1	0	

2. $F = a+b \qquad G = a\cdot c \qquad H = b+d$

a) Nacrtaj BDD-ove za svaku od ovih funkcija

$F = a+b = ite(a,1,b) \qquad G = ac = ite(a,c,0) \qquad H = b+d = ite(b,1,d)$



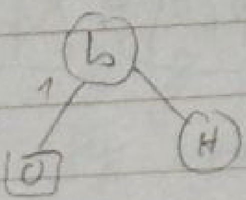
ne moramo spajati jedinice
i nule, to se pretpostavlja

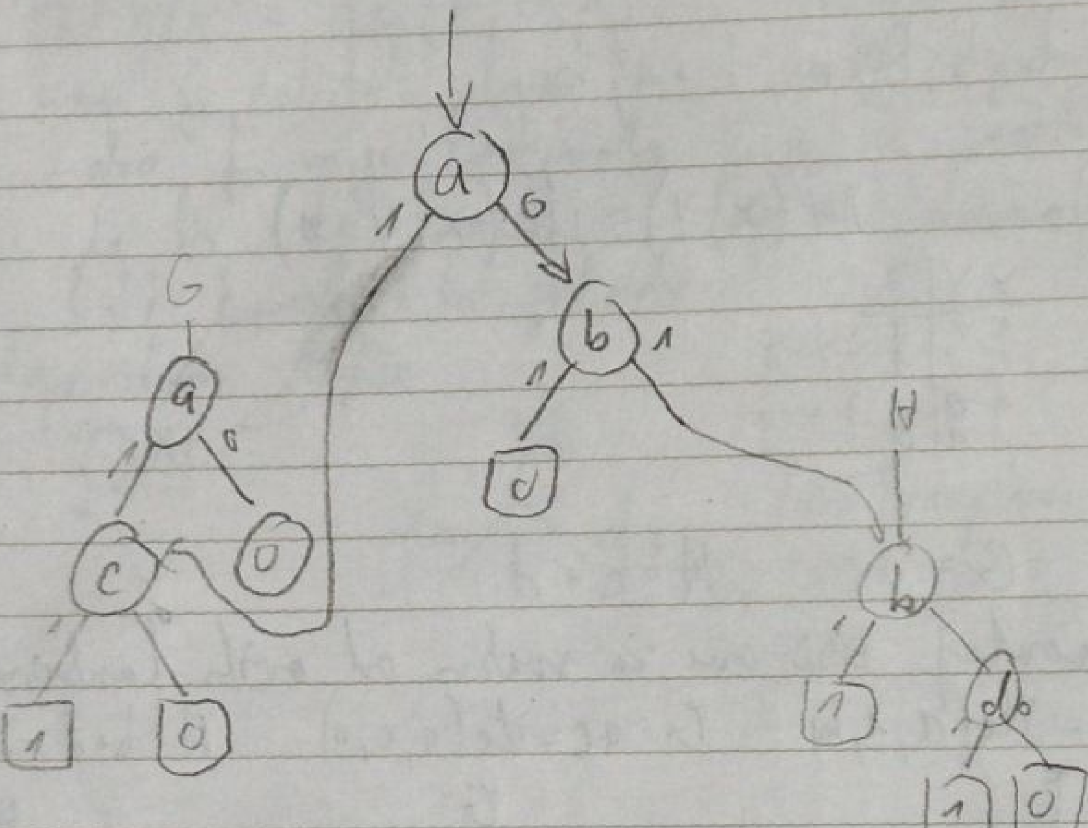
b) Izračunaj ite(F, G, H) i nacrtaj BDD dijagram
redoslijed: a, b, c, d

$$ite(F, G, H) = [a, ite(F_a, G_a, H_a), ite(F_{a'}, G_{a'}, H_{a'})] =$$

pozitivni kofaktori   negativni kofaktori

$$= [a, \underbrace{ite(\underbrace{(1+b)}_{1}, c, H)}_{c}, ite(b, 0, H)] =$$

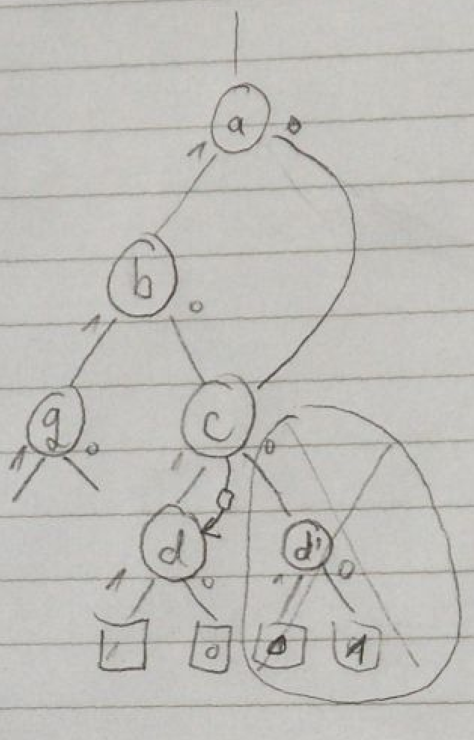


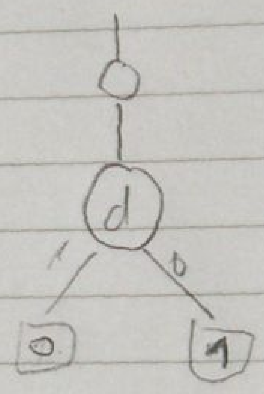


- a je vršna varijabla (određeno redoslijedom)
- završili smo s H, mogli smo i to dalje riješiti

3. Neka je rezultat ite$(F, G, H) = (a, \underbrace{(b, g, (c, d, d'))}_{\text{za } a=1}, \underbrace{(c, d, d')}_{\text{za } a=0})$

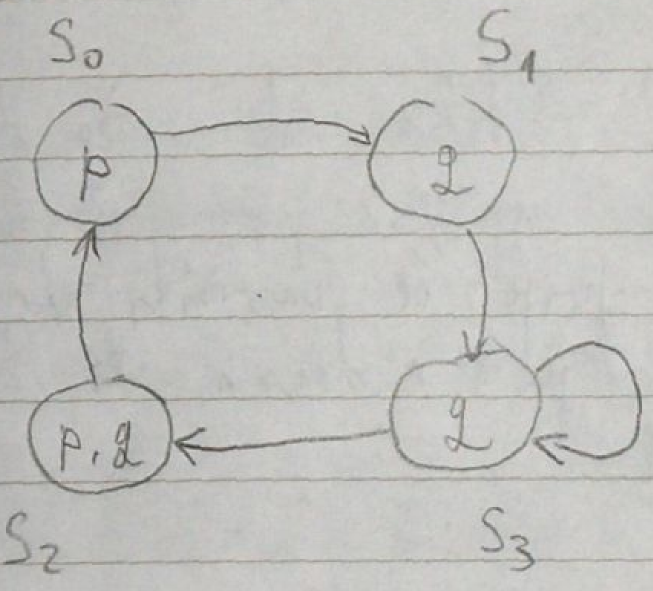
Nacrtaj ROBDD upotrijebivši komplement na lukovima.





- d i d' potpuno različite funkcije, ne ih miješati

- za $c=0$, zbog komplementa imamo obrnuto i onda to sprovedemo na d (umjesto d')



Naći sva stanja za koja vrijedi $EG\,q$

$$Q[EG\,q] = ?$$

$$Q[q] = \{s_1, s_2, s_3\}$$
$$Q[EG\,q] = Q[q] \cap R^{-1}[Q[EG\,q]]$$

$$R^{-1}[Q[q]] = R^{-1}\{s_1, s_2, s_3\} = \{s_0, s_1, s_3\}$$ gledano iz kojih stanja možemo doći u s_1, s_2 ili s_3

$$Z_1 = \{s_1, s_2, s_3\} \cap \{s_0, s_1, s_3\} = \{s_1, s_3\}$$
$$R^{-1}\{s_1, s_3\} = \{s_0, s_1, s_3\}$$
$$Z_2 = \{s_1, s_2, s_3\} \cap \{s_0, s_1, s_3\} = \{s_1, s_3\}$$
=

Stanja s_1 i s_3 zadovoljavaju $Q[EG\,q]$