1.) Algoritam za izracunavanje zatvaraca

F = {AB->AC, CD->E, A->B, AE->F}
AB->A AB->C (AB -> AC)

ZATVARAC
$(AD)^+$ = AD
$(AD)^+$ = ADB (A->B)
$(AD)^+$ = ADBC (AB->C)
$(AD)^+$ = ADBCE (CD->E)
$(AD)^+$ = ADBCEF (AE->F)

2.)
F = {AB->C, C->A, BC->D, ACD->B, D->EG, BE->C, CG->BD, CE->AG}

D->E D->G (D -> EG)
CG->B CG->D (CG->BD)
CE-> A CE->G (CE -> AG)

$(BD)^+$ = BDEGCA

3.)
F = {A->B, A->C, A->E, D->C, E->I, BI->J}

$(AI)^+$ = AIBCEJ
$(DJ)^+$ = DJC
$(BE)^+$ = BEIJ

4.)
algoritam za trazenje kljuca

R = {A, B, C, D, E} skup obelezja
F = {AB->CDE, E->A, CD->B}
AB->C, AB->D, AB->E (AB -> CDE)

$(ABCDE)^+$ = ABCDE = R /E
$(ABCD)^+$ = ABCDE = R/D
$(ABC)^+$ = ABCDE = R /C
$(AB)^+$ = ABCDE = R /B
$(A)^+$ = A
$(B)^+$ = B

K = {AB, EB, ACD, ECD}

5.)
U = {A, B, C, D, E, F}
F={AB->C, C->A, C->D, AB->E, AB->F, E->F}

$(ABCDEF)^+$ = ABCDEF = U /F
$(ABCDE)^+$ = ABCDEF = U /E
$(ABCD)^+$ = ABCDEF = U /D
$(ABC)^+$ = ABCDEF = U /C
$(AB)^+$ = ABCDEF = U /B
$(A)^+$ = A
$(B)^+$ = B

K = {AB, CB}

6.)
F = {AB->CE, C->B, ED->F, F->G}
R={A, B, C, D, E, F, G, H}
H i D svakako mora biti u ključu jer se ne javljaju na desnim stranama FZ

$(ABCDEFGH)^+$ = ABCDEFGH /G
$(ABCDEFH)^+$ = ABCDEFGH /F
$(ABCDEH)^+$ = ABCDEFGH /E
$(ABCDH)^+$ = ABCDEFGH / C
$(ABDH)^+$ = ABCDEFGH /B
$(ADH)^+$ = ADH
$(BDH)^+$ = BDH

K = {ABDH, ACDH}

7.) Dokazivanje da je FZ logicka posledica skupa FZ prema Armstrongovim pravilima
F = {A->B, B->C, AC->D, BD->E, C->E}
U= {A, B, C, D, E}
F |= A->D? Treba dokazati.
Prvo se traži zatvarač nad levom stranom (A)
$(A)^+$ = ABCDE
D se nalazi u zatvaraču od A tako da važi FZ A->D.

A->B, B->C $\}\Rightarrow_{A3}$ A->C, A∈U $\}\Rightarrow_{A2}$ A->AC, AC->D $\}\Rightarrow_{A3}$ A->D

F |= AD->E? Treba dokazati.
$(AD)^+$ = ABCDE

A->B, D∈U $\}\Rightarrow_{A2}$ AD->BD, BD->E $\}\Rightarrow_{A3}$ AD->E

8.)

F= { A -> F, AB -> CE, AC ->D, EB ->D, D->A , F->AE}

AB->C, AB->E (AB->C)

F->A, F->E (F->AE)

U={A, B, C, D, E, F}

F |= AB->D? Treba dokazati.

$(AB)^+$ = ABFCED

AB->E
EB->D $\}\Rightarrow_{A3}$ EB->D

AB->E
B∈U $\}\Rightarrow_{A2}$ AB->EB
EB->D $\}\Rightarrow_{A3}$ AB->D

9.)

F={AB->C, C->A, BC->D, ACD->B, D->EG, BE->C}

D->E, D->G (D->EG)

CG->B, CG->D (CG -> BD)

CE->A, CE->G (CE->AG)

U={A, B, C,D, E, F, G}

F |= CE->B ? Treba dokazati.

$(CE)^+$ = ABCDEFG

CE->G
C∈U $\}\Rightarrow_{A2}$ CE->CG
CG->B $\}\Rightarrow_{A3}$ CE->B

10.)

F |= BD->C? Treba dokazati.

$(BD)^+$ = ABCDEFG

D->E
B∈U $\}\Rightarrow_{A2}$ BD->BE
BE->C $\}\Rightarrow_{A3}$ BD->C

11.)

F |= CE->D? Treba dokazati.

$(CE)^+$ = ABCDEFG

CE->G
C∈U $\}\Rightarrow_{A2}$ CE->CG
CG->D $\}\Rightarrow_{A3}$ CE->D

12.)

F |= ABG->E? Treba dokazati.

$(ABG)^+$ = ABCDEFG

AB->C
G∈U $\}\Rightarrow_{A2}$ ABG->CG
CG->D $\}\Rightarrow_{A3}$ ABG->D
D->E $\}\Rightarrow_{A3}$ ABG->E

13.)

F |= CD->B? Treba dokazati.

$(CD)^+$ = ABCDEFG

D->G C∈U	}=>A2	CD->CG CG->B	}=>A3	CD->B

14.)

F={AB->AC, CD->E, A->B, AE->F}

U={A, B, C, D, E, F}

F |= AD->F? Treba dokazati.

$(AD)^+$ = ABCDEF

A->B A∈U	}=>A2	A->AB AB->C	}=>A3	A->C D∈U	}=>A2	AD->CD CD->E	}=>A3	AD->E A∈U

}=>A2	AD->AE AE->F	}=>A3	AD->F