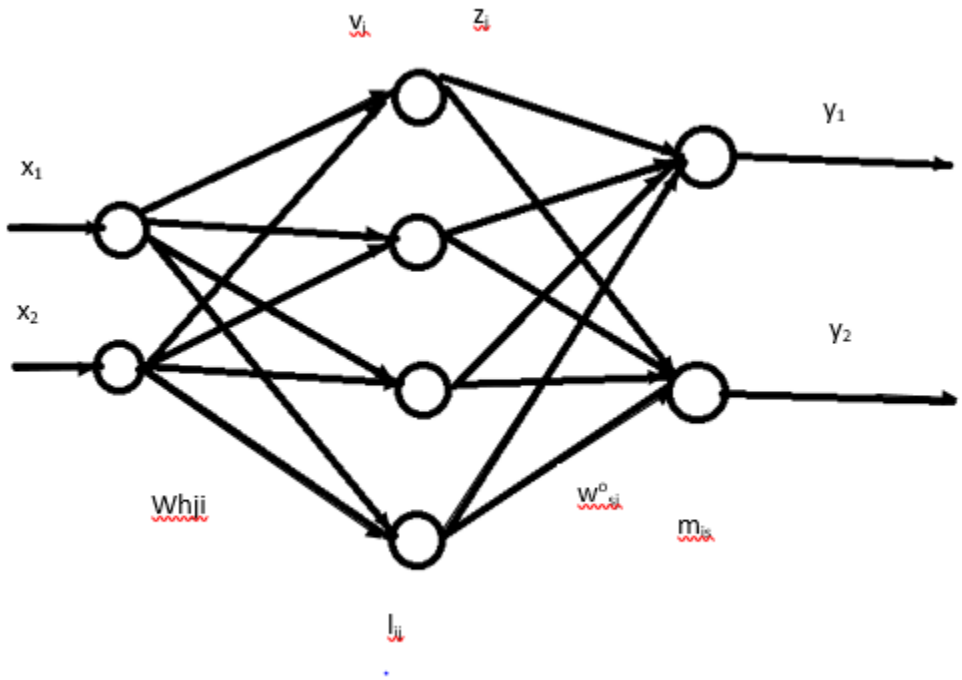
1. Zadatak

   Odgovor: Složenost pretraživanja liste:
   b) O(log2 n)…O(n)

2. Zadatak

2a)



2b)

$X_{d,1} = [\ 2\ 0\ ]^T$

$Y_{d,1} = [-1\ 1]$

K=0

$$w_h^{(0)} = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}^T$$

$\theta_h^{(0)} = [0\ 0\ 0\ 0]^T$

$$W_0^{(0)} = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

$\theta_0^{(0)} = [\ 0\ 0]^T$

Unaprijedno:

$v = w_h^{(0)} * X_{d,1} - \theta_h^{(0)} = [0\ 0\ 0\ 0]^T - [0\ 0\ 0\ 0]^T = [0\ 0\ 0\ 0]^T$

$z = 1/(1+ e^{\wedge -v}) = [0.5\ 0.5\ 0.5\ 0.5]^T$

$u = w_0^{(0)} * z - \theta_0^{(0)} = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}^T * [0.5\ 0.5\ 0.5\ 0.5]^T - [0\ 0\ 0\ 0] =$

$= [0\ 0] - [0\ 0] = [0\ 0]$

$y = 1/(1+e^{-u}) = [0.5\ 0.5]$

$EA = y - y_d = [0.5\ 0.5] - [-1\ 1] = [1.5\ -0.5]$

Rasprostranjeno unatraga matrično:

$\delta^0 = EI^0 = [1.5\ -0.5]$

$EW^0 = \delta^0 * z^T = [1.5\ -0.5] * [0.5\ 0.5\ 0.5\ 0.5] = \begin{bmatrix} 0.75 & 0.75 & 0.75 & 0.75 \\ -0.25 & -0.25 & -0.25 & -0.25 \end{bmatrix}$

$EA^T = (w_0)^T * EI^0 = = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}^T * [1.5\ -0.5] = [0\ 0\ 0\ 0]^T$

$EI^h = EA^h * z * (1-z) = [0\ 0\ 0\ 0]^T * * [0.5\ 0.5\ 0.5\ 0.5] * [0.5\ 0.5\ 0.5\ 0.5]$

$EI^h = [0\ 0\ 0\ 0]^T$

$\delta^h = [0\ 0\ 0\ 0]^T$

$EW^h = \delta^h * x^T = EI^h * x^T = [0\ 0\ 0\ 0]^T * [2\ 0] = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}^T$

$E\theta^0 = -EA^0 = [-1.5\ 0.5]$

$E\theta^h = -EI^h = [0\ 0\ 0\ 0]^T$

2c)

$\alpha = 1$

Treba osvježiti parameter w_h, θ_h, W_0, θ_0 te za novi par za uvježbavanje uzeti 2. red tablice $X_{d,2}$, i $Y_{d,2}$.

$w_h^{(1)} = w_h^{(0)} - \alpha * Ew^h$

$w_h^{(1)} = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}^T - 1 * \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}^T = \begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}^T$

$\theta_h^{(1)} = \theta_h^{(0)} - \alpha * E\theta^h = [0\ 0\ 0\ 0]^T - 1 * [0\ 0\ 0\ 0]^T = [0\ 0\ 0\ 0]^T$

…

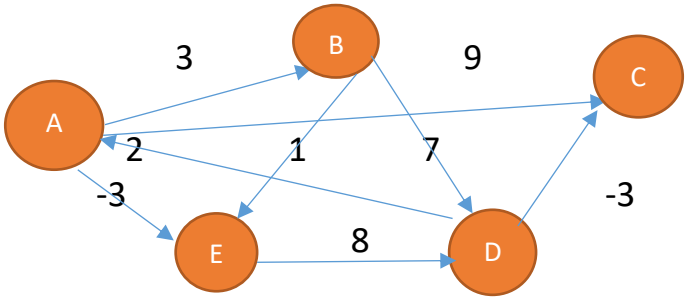
3. zadatak)
   Kapacitet vreće je 10kg.
   500 HRK košta povećanje za 3kg, te je tada kapacitet vreće 13kg

	100 Svitak	200 Rukavice	400 Cipele	400 Mač	800 Štit	1000 Nož
1	100	100	100	100	100	100
2	100	200	200	200	200	200
3	100	300	300	300	300	300
4	100	300	400	400	400	400
5	100	300	500	500	800	800
6	100	300	600	600	900	900
7	100	300	700	700	1000	1000
8	100	300	700	700	1100	1100
9	100	300	700	700	1200	1200
10	100	300	700	700	1300	1300
a11	100	300	700	700	1400	1400
12	100	300	700	800	1500	1800
13	100	300	700	900	1500	1900

Isplativije je opljačkati s vrećom od 13kg jer tada zarada 1400kn. Račun 1900kn zarada od krađe – 500kn cijena povećanja kapaciteta. Kada bi se pljačkaš odlučio za standardnu vreću zarada bi bila manje, 1300kn.

4. zadatak

Warshall-Floyd-Ingermanovim algoritam WFI



4a)

$$D^0 = \begin{pmatrix} 0 & 3 & 9 & \infty & -3 \\ \infty & 0 & \infty & 7 & 1 \\ \infty & \infty & 0 & \infty & \infty \\ -2 & \infty & -3 & 0 & \infty \\ \infty & \infty & \infty & 8 & 0 \end{pmatrix} \qquad \prod^0 = \begin{pmatrix} NIL & A & A & NIL & A \\ NIL & NIL & NIL & B & B \\ NIL & NIL & NIL & NIL & NIL \\ D & NIL & D & NIL & NIL \\ NIL & NIL & NIL & E & NIL \end{pmatrix}$$

$$D^1 = \begin{pmatrix} 0 & 3 & 9 & \infty & -3 \\ \infty & 0 & \infty & 7 & 1 \\ \infty & \infty & 0 & \infty & \infty \\ -2 & 5 & -3 & 0 & -1 \\ \infty & \infty & \infty & 8 & 0 \end{pmatrix} \qquad \prod^1 = \begin{pmatrix} NIL & A & A & NIL & A \\ NIL & NIL & NIL & B & B \\ NIL & NIL & NIL & NIL & NIL \\ D & A & D & NIL & A \\ NIL & NIL & NIL & E & NIL \end{pmatrix}$$

$$D^2 = \begin{pmatrix} 0 & 3 & 9 & 10 & -3 \\ \infty & 0 & \infty & 7 & 1 \\ \infty & \infty & 0 & \infty & \infty \\ -2 & 5 & -3 & 0 & -1 \\ \infty & \infty & \infty & 8 & 0 \end{pmatrix} \qquad \prod^2 = \begin{pmatrix} NIL & A & A & B & A \\ NIL & NIL & NIL & B & B \\ NIL & NIL & NIL & NIL & NIL \\ D & A & D & NIL & A \\ NIL & NIL & NIL & E & NIL \end{pmatrix}$$

$$D^3 = \begin{pmatrix} 0 & 3 & 9 & 10 & -3 \\ \infty & 0 & \infty & 7 & 1 \\ \infty & \infty & 0 & \infty & \infty \\ -2 & 5 & -3 & 0 & -1 \\ \infty & \infty & \infty & 8 & 0 \end{pmatrix} \qquad \prod^3 = \begin{pmatrix} NIL & A & A & B & A \\ NIL & NIL & NIL & B & B \\ NIL & NIL & NIL & NIL & NIL \\ D & A & D & NIL & A \\ NIL & NIL & NIL & E & NIL \end{pmatrix}$$

$$D^4 = \begin{pmatrix} 0 & 3 & 9 & 10 & -3 \\ 9 & 0 & 4 & 7 & 1 \\ \infty & \infty & 0 & \infty & \infty \\ -2 & 5 & -3 & 0 & -1 \\ 10 & 13 & 5 & 8 & 0 \end{pmatrix} \qquad \Pi^4 = \begin{pmatrix} NIL & A & A & B & A \\ D & NIL & D & B & B \\ NIL & NIL & NIL & NIL & NIL \\ D & A & D & NIL & A \\ D & D & D & E & NIL \end{pmatrix}$$

$$D^5 = \begin{pmatrix} 0 & 3 & 9 & 10 & -3 \\ 9 & 0 & 4 & 7 & 1 \\ \infty & \infty & 0 & \infty & \infty \\ -2 & 5 & -3 & 0 & -1 \\ 10 & 13 & 5 & 8 & 0 \end{pmatrix} \qquad \Pi^5 = \begin{pmatrix} NIL & A & A & B & A \\ D & NIL & D & B & B \\ NIL & NIL & NIL & NIL & NIL \\ D & A & D & NIL & A \\ D & D & D & E & NIL \end{pmatrix}$$

4b)
A i D, iz tablice vidimo da je to 10 I to iz čvora: A->B->D

4c)
Strogo povezano nije zato što ne postoji put zbog C-a.

4d)
Postoje ciklusi npr. ABEDA trivijalno.