

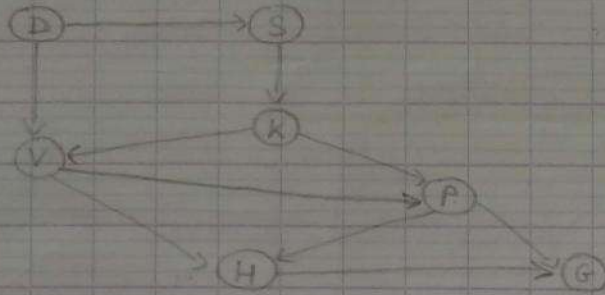
1.12.11

Théorie des graphes TD

I.

1. Conseil d'administration

a)



$$G = (S, A)$$

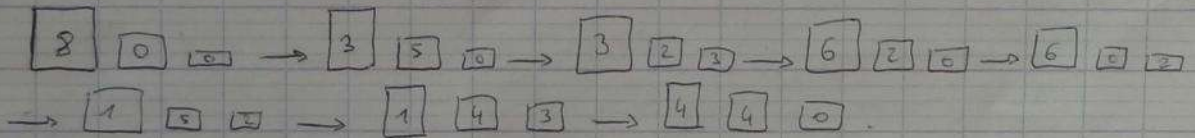
$$S = \{\text{personne}\}$$

- b) $\Gamma^1(x) = x$ influence directent⁺ ; $\Gamma^{-1}(x) = x$ est influence directent⁺
 $\Gamma^*(x) = x$ et/ou indirectent⁺
 $\Gamma^1(D) = \{S, V\}$ $\Gamma^{-1}(D) = \{\emptyset\}$ $\Gamma^*(D) = \{S, V, K, P, H, G\}$

2. Bouteilles

one $\Rightarrow$ orienté
 arête $\Rightarrow \phi$

(a)

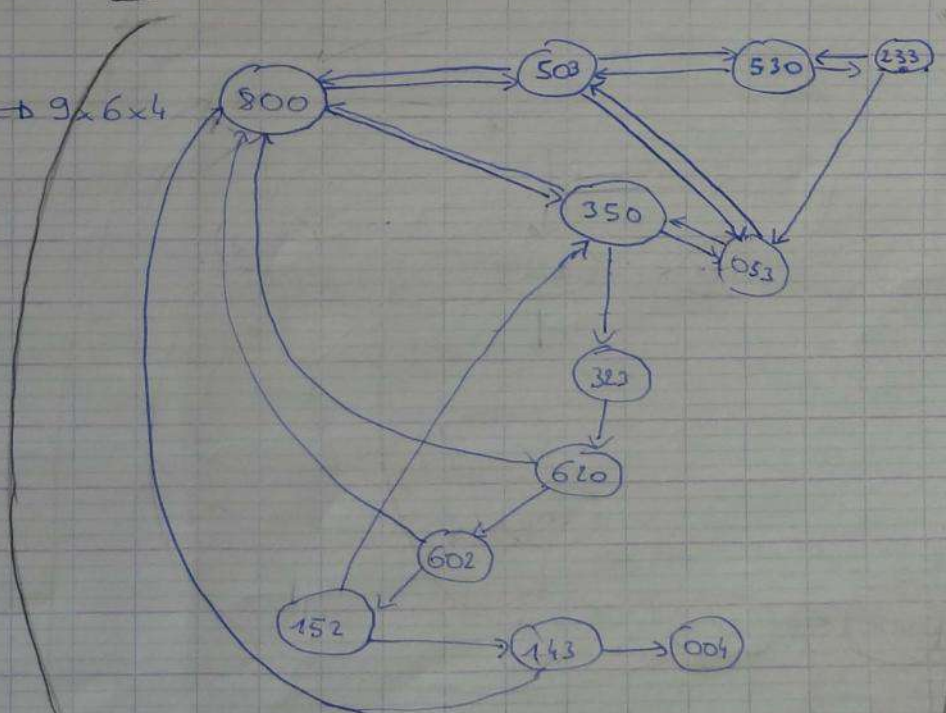
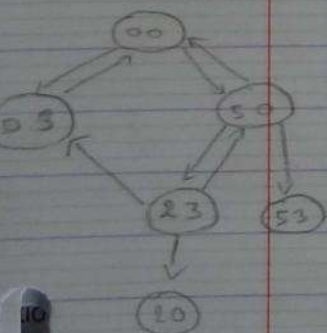


$$G = (S, A)$$

$$S = \{(b8, b5, b3)\} \rightarrow 9 \times 6 \times 4$$

$$A = \{\text{ana}\}$$

On diminue : (b5, b3) : 6 x 4



Ici on peut f^2 ça direct car cas simple

- b) Utiliser Dijkstra(x) ou Bellman - Ici cha^e arc vaut 1.
 ↳ Bellman obligé de tt faire, pas Dijkstra ⇒ + intéressant.
- c) Sur cha^e arc on met la qte de vin déplacé.
- d) On veut : 4L dans une bouteille, et la Σ des autres = à 4.
 cad : 440 - 431 - 422 - 413 - 341 - 242 - 143.

II. Représentat^o et algo généraux

1. Matrice incidence / adjacence et d^o

a) Mat adj : $S \times S \rightarrow \{\text{vrai, faux}\}$ - Mat inc : $S \times A \rightarrow \{0, +1, -1\}$

	x_1	x_2	x_3	x_4	x_5
x_1	F	V	F	F	V
x_2	F	F	F	F	V
x_3	V	F	F	F	F
x_4	F	F	F	F	F
x_5	V	F	V	F	F

	u_1	u_2	u_3	u_4	u_5	u_6	u_7	u_8	u_9
x_1	1	0	0	0	-1	1	-1	0	0
x_2	-1	1	1	1	0	0	0	0	0
x_3	0	0	0	0	0	0	1	-1	-1
x_4	0	0	0	0	0	0	0	0	0
x_5	0	-1	-1	-1	1	-1	0	1	1

b) $d^-(x_3) = 4$ $d^+(x_5) = 3$ $d^- \rightarrow |\Sigma - 1|$; $d^+ \rightarrow \Sigma 1$

Mat adj : lg F ⇒ pas de successeurs. col F ⇒ pas de prédécesseurs.

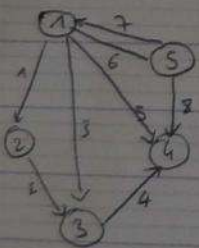
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2. SDD : représentat^o mêm et manipulato^o de base.

Matrice $\leftrightarrow$ []
 (math) (info)

```
typedef struct {
    int nbS;
    bool ** mat;
} t_mat_adj;
```

```
typedef struct {
    int nbS;
    int nbA;
    int ** mat;
} t_mat_inc;
```



mat incidence

	1	2	3	4	5	6	7	8
①	1	0	1	0	1	1	-1	0
②	-1	1	0	0	0	0	0	0
③	0	-1	-1	-1	0	0	0	0
④	0	0	0	-1	-1	0	0	-1
⑤	0	0	0	0	0	-1	1	1

mat adj.

	①	②	③	④	⑤
①	F	V	V	V	V
②	F	F	V	F	F
③	F	F	F	V	F
④	F	F	F	F	F
⑤	V	F	F	F	F

```

void printSucc
int nbSucc (int S, t_mat_adj G)
{
    int cpt=0;
    for(int succ=0; succ<G.nbS; succ++)
    {
        if(G.mat[S][succ]==true)
        {
            cpt++; printf("succ");
        }
    }
    return cpt;
}
    
```

Mat d'incidence

arc succ — 1

S — 1

(...)

```

for(int arc<G.nbA; arc++)
{
    if( — == 1)
    {
        for(int succ=0; succ<G.nbS; succ++)
        {
            if(G.mat[S][succ]==-1)
            {
                printf("succ");
            }
        }
    }
}
    
```

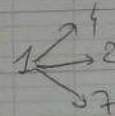
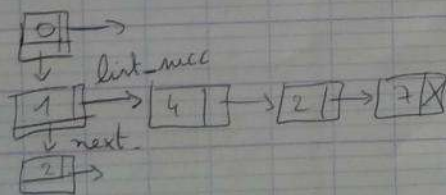
* printf

```

typedef elt_list_succ struct
{
    int sommet; // extrémité terminale
    elt_list_succ * next
} elt_list_succ
    
```

```

typedef elt_list_som struct
{
    int sommet; // extrémité initiale
    elt_list_succ * list_succ
    elt_list_som * next // elt_list_som
}
    
```



III - Chemin k + count

G01

• $CC = \{0\}$ $M = \{1, 2, 3, 4, 5, 6\}$

$\pi(1) = 14$ $\pi(4) = 5$

• $CC = \{0, 4\}$ $M = \{2, 3, 1, 5, 6\}$

$\pi(5) = 8$

• $CC = \{0, 4, 5\}$ $M = \{2, 3, 6, 1\}$

$\pi(6) = 10$

$\pi(2) = 8 + 11 = 19$

• $CC = \{0, 4, 5, 6\}$ $M = \{2, 3, 1\}$

$\pi(1) = 10 + 9 = 19 \otimes \rightarrow 14$

$\pi(4) = 10 + 7 = 17 \otimes \rightarrow 5$

• $CC = \{0, 1, 4, 5, 6\}$ $M = \{3, 2\}$

$\pi(3) = 14 + 6 = 20$

Done $\left\{ \begin{array}{l} \pi(1) = 14 \\ \pi(2) = 19 \\ \pi(3) = 20 \\ \pi(4) = 5 \\ \pi(5) = 8 \end{array} \right.$

visual 2

CC	M	0	1	2	3	4	5	6
0	1, 2, 3, 4, 5, 6	0, /	14, 0	∞	∞	5, 0	∞	∞
0, 4	1, 2, 3, 5, 6			∞	∞	8, 4	∞	
0, 4, 5	1, 2, 3, 6			19, 5	∞		10, 5	

π ; précédent visual 2

$k = 1$

$\pi^1(1) = 14$

$\pi^1(4) = 5$

$k = 2$

$\pi(5) = 8$

$\pi(3) = 20$

$k = 3$

$\pi(6) = 10$

$\pi(2) = 19$

$k = 4$

$\pi(3) = 19 + 8 = 27 \otimes$

$\pi(4) = 10 + 7 = 17 \otimes$

$\pi(1) = 10 + 9 = 19 \otimes$

Done $\left\{ \begin{array}{l} \text{Idem} \end{array} \right.$

k	0	1	2	3	4	5	6
0	0, /	∞	∞	∞	∞	∞	∞
1		14, 0	∞	∞	5, 0	∞	∞
2			∞	20, 1		8, 4	∞
3			19, 5				10, 5
4							