13 - 5 - 2025

TD APE

TD3. EX01:

1)

```
MOV  R1, #0x1000
MOV  R2, #0
boucle:
STRB R2, [R1], #1
CMP  R1, #10
BLS  boucle
B    .
```

```
MOV  R1, #0x1000
MOV  R2, #0
STR  R2, [R1], #4
STR  R2, [R1], #4
STRH R2, [R1], #2
STRB R2, [R1]
```

2)

```
MOV  R3, #0x3B00
MOV  R4, #0x7D7D7D7D
STRB R4, [R3], #1
STRH R4, [R3], #2
STR  R4, [R3]
```

TD3. EX02:

15 - 4 - 2025

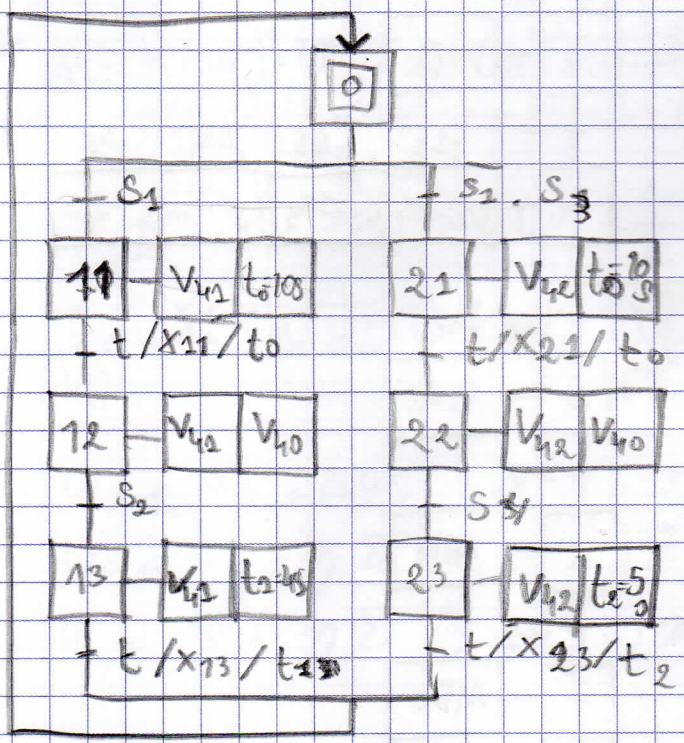
TD API

TD3 . EXO2 :

-> La liste de E/S

. Entrées : S_1, S_2, S_3, S_4

. Sorties : V_{40}, V_{41}, V_{42}



TD4 . EXO

. Remarques :

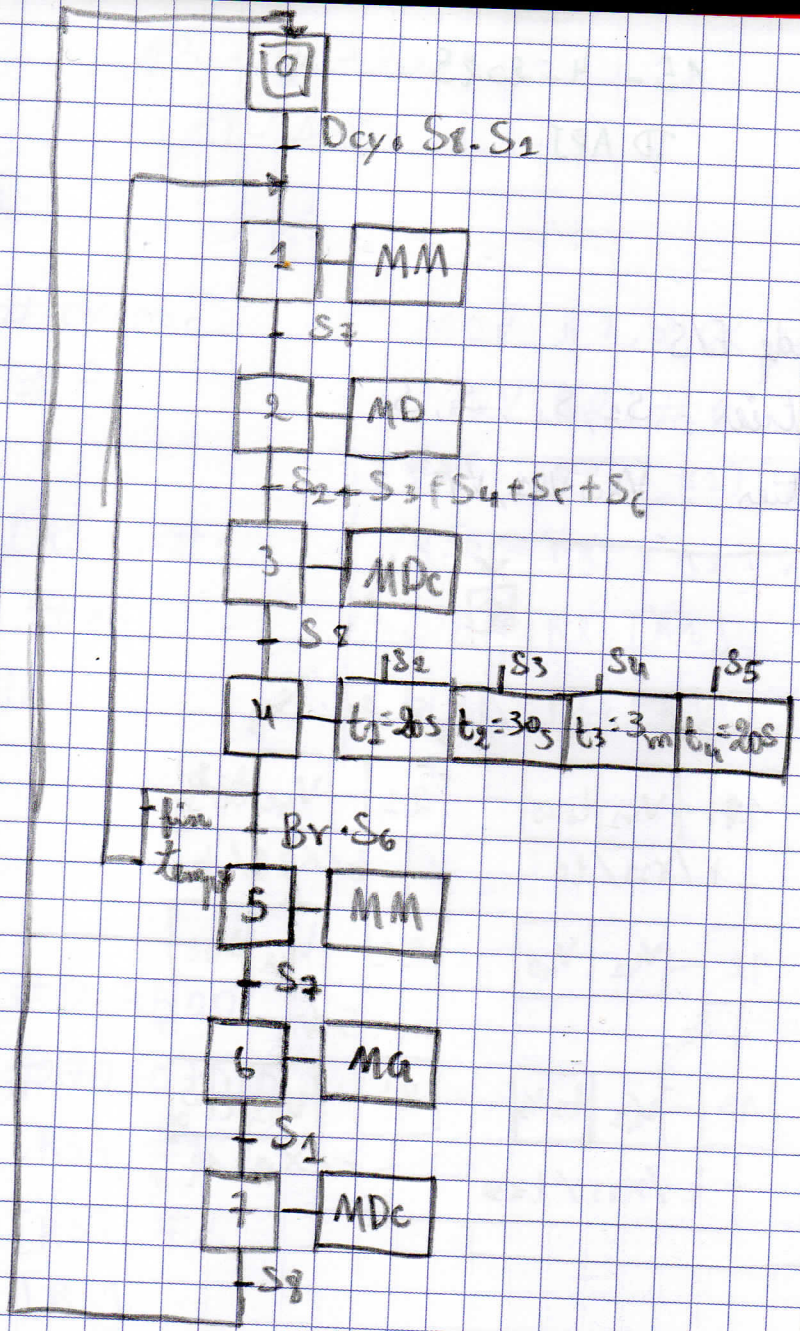
1) Chargement / Déchargement est manuel

2) Arrivée à l'aire de déchargement, l'opérateur Appuie sur Bouton Retour

Liste de E/S

Entrées : Dcy , Br , S_1, S_2, S_3, S_4, S_5, S_6, S_7, S_8

Sorties : MM : Montée ; MD : Droite ; MD_c : Descent ; MG : Gauche


0
Dcy6 S8. S1
1
MM
S2
2
MD
S2 + S3 + S4 + S5 + S6
3
MDc
S2
4
S2
S3
S4
S5
t1 = 2ms
t2 = 30s
t3 = 3mn
t4 = 20s
fin
Br. S6
5
MM
S7
6
MG
S1
7
MDc
S8

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TD API

TD4. EXO2 :

$X_1 = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \Rightarrow y_1 = 0$; $X_2 = \begin{pmatrix} 0 \\ 1 \end{pmatrix} \Rightarrow y_1 = 0$

$X_3 = \begin{pmatrix} 1 \\ 0 \end{pmatrix} \Rightarrow y_3 = 0$; $X_4 = \begin{pmatrix} 1 \\ 1 \end{pmatrix} \Rightarrow y_4 = 0$

Rappelle : $z = \sum (x_i w_i) + w_0$; $\sigma(z) = \frac{1}{1+e^{-z}}$

$$L = \frac{1}{2}(y_i - \hat{y}_i)^2 \; ; \; J(w) = \frac{1}{2} \sum_i (y_i - \hat{y}_i)^2$$

$$\nabla J(w) = \frac{\partial J}{\partial w_j} = -\sum (y_i - \hat{y}_i) x_{ij} \; ; \; \nabla J(w_0) = \frac{\partial J}{\partial w_0} = -\sum (y_i - \hat{y}_i)$$

$$w_j \leftarrow w_j + \Delta w_j \; ; \; \Delta w_j = -\eta \nabla J(w)$$
$$w_0 \leftarrow w_0 + \eta \sum (y_i - \hat{y}_i)$$
$$w \leftarrow w + \eta \sum (y_i - \hat{y}_i) x_j$$

$\hat{y}_1 = 0,5$; $\hat{y}_2 = 0,38$; $\hat{y}_3 = 0,62$; $\hat{y}_4 = 0,5$

$\mathcal{L}_{\hat{y}_1} = 0,125$; $\mathcal{L}_{\hat{y}_2} = 0,71$; $\mathcal{L}_{\hat{y}_3} = 0,19$; $\mathcal{L}_{\hat{y}_4} = 0,125$

$J(w) = 0,514$

$\frac{\partial J}{\partial w_0} = \eta \cdot 1$ (illegible)

$\frac{\partial J}{\partial w_0} = -\sum (y_i - \hat{y}_i) = -(-0,5 - 0,38 - 0,62 + 0,5) = 1$

$\frac{\partial J}{\partial w_1} = -[(y_1 - \hat{y}_1) x_{11} + (y_2 - \hat{y}_2) x_{21} + (y_3 - \hat{y}_3) x_{31} + (y_4 - \hat{y}_4) x_{41}]$

$= -(0 \cdot -0,5 + 0 \cdot -0,38 + 1 \cdot 0,62 + 1 \cdot 0,5) = 0,12$

$\frac{\partial J}{\partial w_j} = -\sum_i [y_i - \hat{y}_i] x_{ij}$

$$\frac{\partial J}{\partial w_2} = -\left[(y_1 - \hat{y}_1)\, x_{12} + (y_2 - \hat{y}_2)\, x_{22} + (y_3 - \hat{y}_3)\, x_{32} + (y_4 - \hat{y}_4)\, x_{42}\right]$$

$$= -\left[0 \cdot -0,1 + 1 \cdot -0,38 + 0 \cdot -0,62 + 1 \cdot 0,1\right]$$

$$= -0,12$$

$w_0 \leftarrow w_0 - \eta \nabla J(w_0) \Rightarrow w_0 = 0 - 0,1 \cdot 1 = -0,1$

$w_1 \leftarrow w_1 - \eta \nabla J(w_1) \Rightarrow w_1 = 0,5 - 0,1 \cdot (+0,12) = 0,488$

$w_2 \leftarrow w_2 - \eta \nabla J(w_2) \Rightarrow w_2 = -0,5 - 0,1 \cdot (-0,12) = -0,488$

$$\frac{\partial J}{\partial w_2} = -\left[(y_1 - \hat{y}_1)\, x_{12} + (y_2 - \hat{y}_2)\, x_{22} + (y_3 - \hat{y}_3)\, x_{32} + (y_4 - \hat{y}_4)\, x_{42}\right]$$

$$= -\left[0 \cdot -0{,}1 + 1 \cdot -0{,}38 + 0 \cdot -0{,}62 + 1 \cdot 0{,}1\right]$$

$$= -0{,}12$$

$$w_0 \leftarrow w_0 - \eta \nabla J(w_0) \Rightarrow w_0 = 0 - 0{,}1 \cdot 1 = -0{,}1$$

$$w_1 \leftarrow w_1 - \eta \nabla J(w_1) \Rightarrow w_1 = 0{,}5 - 0{,}1 \cdot (+0{,}12) = 0{,}488$$

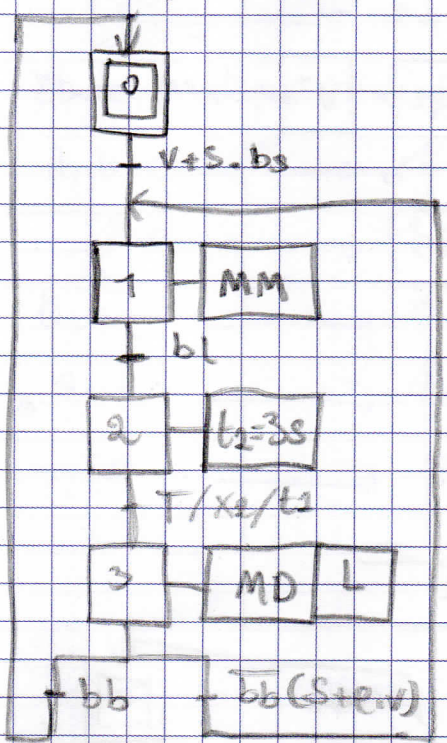
$$w_2 \leftarrow w_2 - \eta \nabla J(w_2) \Rightarrow w_2 = -0{,}5 - 0{,}1 \cdot (-0{,}12) = -0{,}488$$

22.4.2025

TD API

TD5. EXO4:

- Liste des entrées:
  - e.s : capteur optique
  - bs : bouton de sortie
  - v : validateur de code
  - bl. bb : fin de courses ((barrière levée ; barrière baissée))
- Les Sorties:
  - MM : Moteur Montée
  - MD : " Descente
  - L : Lampe



TD 1 EXO 1 :

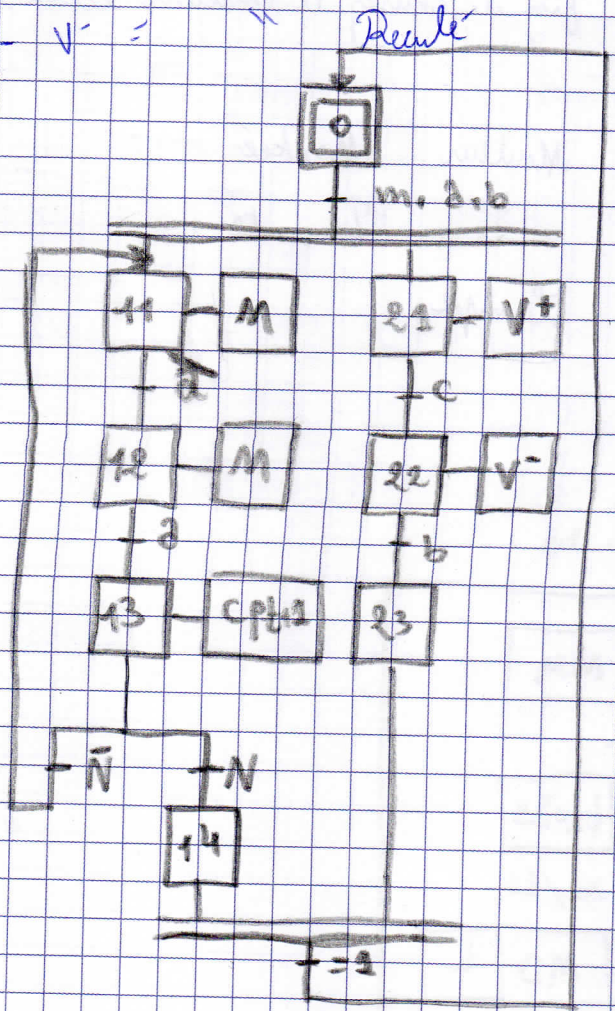
- Liste d'entrée et sortie :

→ Entrées :

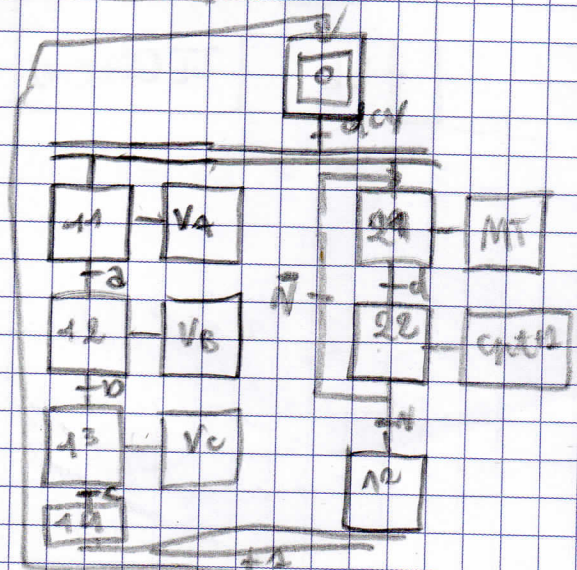
- m : bouton Départ Cycle
- a, b, c : Capteur fin de course

→ Sorties :

- M = Moteur
- V⁺ = vérin Avancé
- V⁻ = " Reculé



TD 5 EXO 1 :



22-04-2021

TD APE

TD4 EX01 :

$$d = \frac{b - 3c}{a - 5} \qquad a, b, c \rightarrow 8\text{bit}$$

→ Etude de l'allocation de la mémoire :

- Etude Théorique :

a, b, c ⟶ 8bits

3 * C ⟶ 2+8 = 10 bits

b - 3C (8, 10) ⟶ 10+1 = 11 bits

a - 5 (8, 3) ⟶ 8+1 = 9 bits

$d = \frac{b - 3c}{a - 5}$ (11, 9) ⟶ 11-9 = 2 bits

- Etude pratique : ((de programme))

a, b, c —ent→ 16bits

3 C ⟶ 16 bits

b - 3 C ⟶ 16 bits

a - 5 ⟶ 16 bits

d ⟶ 8 bits