

$$\Rightarrow y(3) = \frac{3^3}{3 - \frac{1}{2}} - \frac{2^3}{3 - \frac{1}{3}} \Rightarrow y(k) = 3\left(\frac{1}{2}\right)^k - 2\left(\frac{1}{3}\right)^k$$

3-14-2024

SAMC TD

TD9, exo3 :

Besoin matérielle :

- Button Reservoir
 - LCD • CAN
 - UART

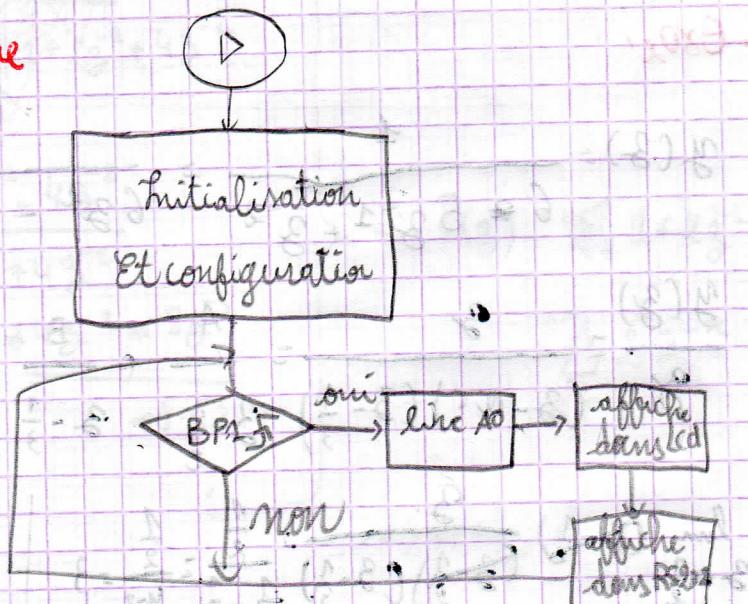
Besoin fonctionnels :

- BP1 => lire la valeur "conversion A/N"
 - afficher la valeur en mV dans le LCD
 - si " " " : " V avec 2 numéros après la "," "

Configuration :

- BP1 (11, PB3) \rightarrow entré digital + activation pull-up
 - LCD
 - Initialization de l'UART
 - " Convertisseur A/N

Organigramme



Program

```
#include <LiquidCrystal.h>
LiquidCrystal Lcd(3,2,4,5,6,7);
bool VBP;

void setup(){
    Serial.begin(19200);
    Lcd.begin(16,2);
    pinMode(A0, INPUT); pinMode(11, INPUT_PULLUP);
    VBP=1; analogReference(DEFAULT);
}

void loop(){
    bool BP=digitalRead(11);
    if (BP==0 && VBP==1) VBP=0;
    if (BP==1 && VBP==0) {VBP=1;
        long V=analogRead(A0);
        long Vin=V*5000/1023;
        Lcd.setCursor(0,0);
        Lcd.print("Vin =");
        Lcd.print(Vin);
        Lcd.print("mV");
        float Vrs=(float) Vin/1000;
        Serial.print("Vrs =");
        Serial.print(Vrs);
        Serial.println("V");
    }
}
```

4-10-2024

TD2 EXO 4:

• Besoin Matérielle :

- BP2
- Timer 0
- 1 LED, D2

SAMC TD

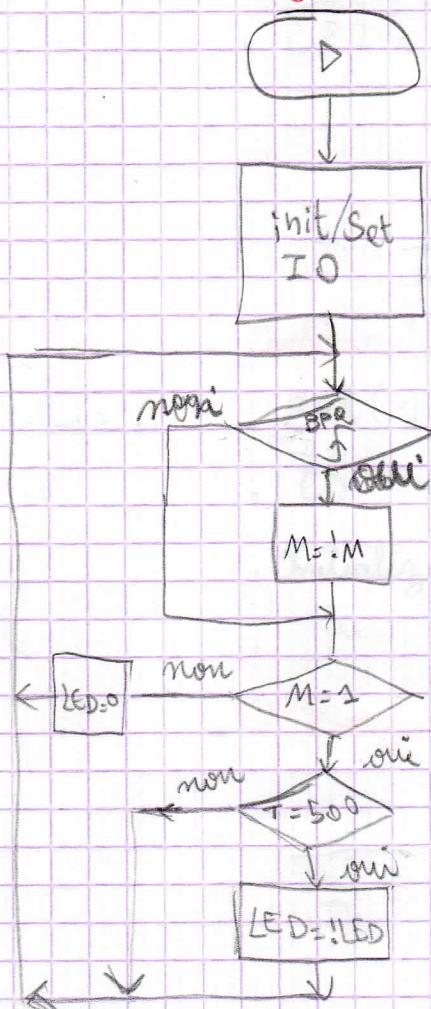
• Besoin fonctionnelle :

- March / Arrêt
- Temporisation [Timer 0]
- Clignotement [march / Arrêt]

• Configuration :

- BP2 (PortB 2 \ 10) → entrée digital avec activation R pull-up
- D2 (PortB 4 \ 12) → sortie "

• Organigramme :



• Programme

```

bool MBP2, BP2, Memo, LED;
unsigned long Told;

void setup(){
    pinMode(10, INPUT_PULLUP);
    pinMode(12, OUTPUT);
    MBP2 = 1; Memo = 0; Told = millis();
}

void loop(){
    BP2 = digitalRead(10);
    if(BP2 == 0 && MBP2 == 1) MBP2 = 0;
    if(BP2 == 1 && MBP2 == 0) { MBP2 = 1; Memo = !Memo; }
    if(Memo){ if((millis() - Told) == 500){
        Told = millis(); LED = !LED;
        digitalWrite(12, LED); } else digitalWrite(12, 0); }
}
    
```

11.2024

SANTD

$T_2 \cdot EKO_3 =$

$$S(z) = \frac{1}{1 - 1,2z^{-1} + 0,2z^{-2}}$$

$$= \frac{z^2}{z^2 - 1,2z + 0,2}$$

$$s(0) = \lim_{n \rightarrow 0} s(n) = \lim_{z \rightarrow \infty} S(z) = \lim_{z \rightarrow \infty} \frac{z^2}{z^2 - 1,2z + 0,2} = \lim_{z \rightarrow \infty} \frac{z^2}{z^2} = 1$$

$$s(+\infty) = \lim_{n \rightarrow \infty} s(n) = \lim_{z \rightarrow 0} S(z) = \lim_{z \rightarrow 0} \frac{z^2}{z^2 - 1,2z + 0,2} = \lim_{z \rightarrow 0} (1 - z^{-1}) S(z)$$

$$= \lim_{z \rightarrow 1} \frac{z-1}{z} \frac{z^2}{z^2 - 1,2z + 0,2} = \lim_{z \rightarrow 1} \frac{z-1}{z} \frac{z^2}{(z-1)(z-0,2)}$$

$$= \lim_{z \rightarrow 1} \frac{z}{z-0,2} = \frac{1}{1-0,2} = \frac{1}{0,8} = 1,25$$

~~10~~ $S(z) = \frac{z^2}{z^2 - 1,2z + 0,2}$

$$\frac{S(z)}{z} = \frac{z}{z^2 - 1,2z + 0,2} = \frac{z}{(z-1)(z-0,2)} = \frac{A}{z-1} + \frac{B}{z-0,2}$$

$$A = \lim_{z \rightarrow 1} \frac{z}{(z-1)(z-0,2)} = \frac{1}{0,8} = 1,25$$

$$B = \lim_{z \rightarrow 0,2} \frac{z}{(z-1)(z-0,2)} = \frac{0,2}{-0,8} = -0,25$$

$$S(z) = 1,25 \frac{z}{z-1} - 0,25 \frac{z}{z-0,2} \Rightarrow s(n) = 1,25(n) - 0,25(0,2)^n$$

$$= 1,25(2 - 0,2(0,2)^n)$$

$$s(n) \in 1,2 \subset (1 - 0,2^{n+1})$$

$$\begin{aligned} a(z) &= \frac{1 - 2z^{-1}}{1 - 1,2z^{-1} + 0,2z^{-2}} \\ &= \frac{1}{1 - 1,2z^{-1} + 0,2z^{-2}} - \frac{2z^{-1}}{1 - 1,2z^{-1} + 0,2z^{-2}} \\ &= S(z) - 2z^{-1} S(z) \end{aligned}$$

$$\Rightarrow g(n) = B(n) - 2 s(n-1)$$