

**Mt Saint Michel**

# **Basic commands and basic circuit practice+Perintah dasar dan latihan rangkaian dasar**



# FX PLC instruction

## Instruksi PLC FX



Command name	Function	Graphics
LD	"a"(NO) contact at the beginning of the circuit	
LDI	"b"(NC) contact at the beginning of the circuit	
LDP	The Front edge pulse of the beginning of the circuit	
LDF	The trailing edge pulse of the beginning of the circuit	
AND	Series an "a"(NO) contact	
ANI	Series an "b"(NC) contact	
ANDP	Series an Front edge pulse contact	
ANDF	Series an trailing edge pulse contact	

# FX PLC instruction

## Instruksi PLC FX



OR	Parallel an "a"(NO) contact	
ORI	Parallel an "b"(NC) contact	
ORP	Parallel an Front edge pulse contact	
ORF	Parallel an trailing edge pulse contact	
MEP	Operation result conversion into a Front edge pulse	
MEF	Operation result conversion into a trailing edge pulse	

# FX PLC instruction

## Instruksi PLC FX



ANB	Block circuit series	
ORB	Block circuit parallel	
OUT	Drive load command	
SET	Operation hold (Forced ON)	
RST	Action hold release (Timer reset, Counter reset)	
PLS	Front edge pulse (1 Scanning time)	
PLF	trailing edge pulse (1 Scanning time)	

# FX PLC instruction

## Instruksi PLC FX



MPS	Memory push	
MRD	Memory read	
MPP	Memory POP	
MC	Master Control	
MCR	Master Control Reset	

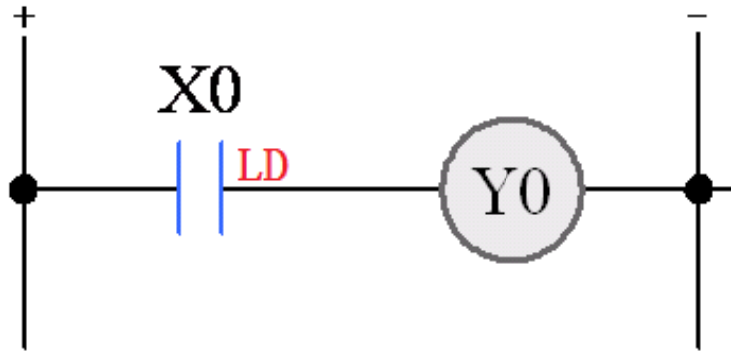
# FX PLC instruction

## Instruksi PLC FX



CJ	Condition Jump	A ladder logic diagram for the CJ instruction. It consists of a single normally open contact on the left, connected to a coil labeled 'CJ P()' on the right.
CALL	Call subroutine	A ladder logic diagram for the CALL instruction. It consists of a single normally open contact on the left, connected to a coil labeled 'CALL P()' on the right.
FEND	First END	A ladder logic diagram for the FEND instruction. It consists of a single normally open contact on the left, connected to a coil labeled 'FEND' on the right.
SRET	Subroutine return	A ladder logic diagram for the SRET instruction. It consists of a single normally open contact on the left, connected to a coil labeled 'SRET' on the right.
NOP	No operation	無
END	END	A ladder logic diagram for the END instruction. It consists of a single normally open contact on the left, connected to a coil labeled 'END' on the right.

# LD/LDI/OUT

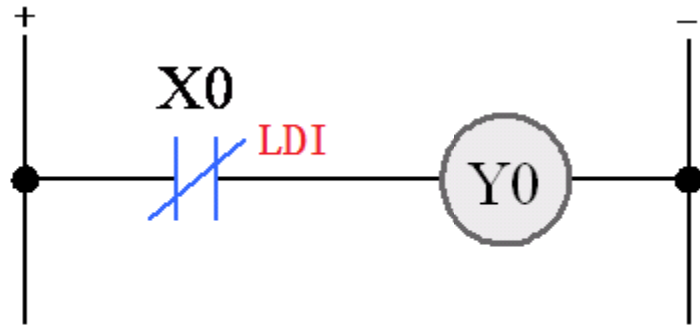


PLC circuit

0	LD	X0
1	OUT	Y0
2	END	

PLC program

# LD/LDI/OUT



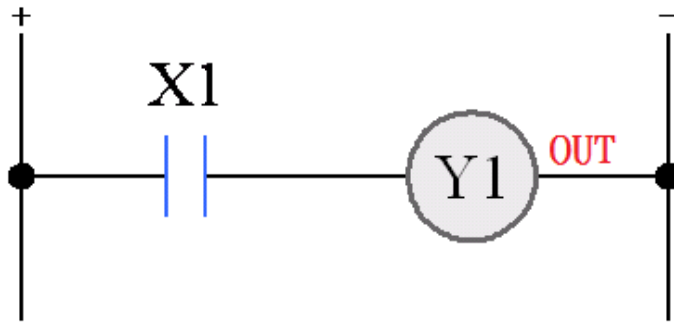
PLC circuit

0	LDI	X0
1	OUT	Y0
2	END	

PLC program



# LD/LDI/OUT

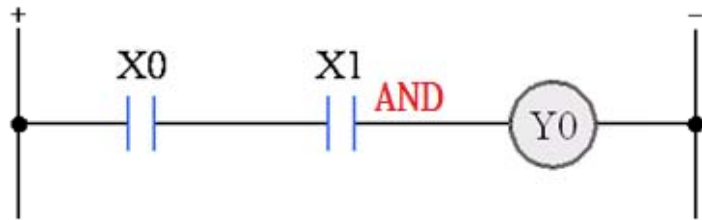


PLC circuit

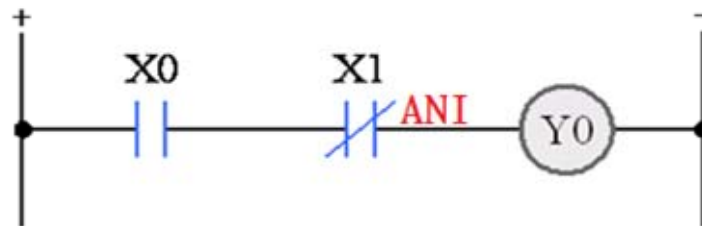
0	LD	X1
1	OUT	Y1
2	END	

PLC program

# AND/ANI/OR/ORI



0	LD	X0
1	AND	X1
2	OUT	Y0
3	END	

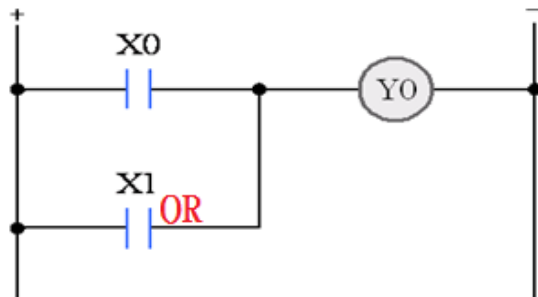


0	LD	X0
1	ANI	X1
2	OUT	Y0
3	END	

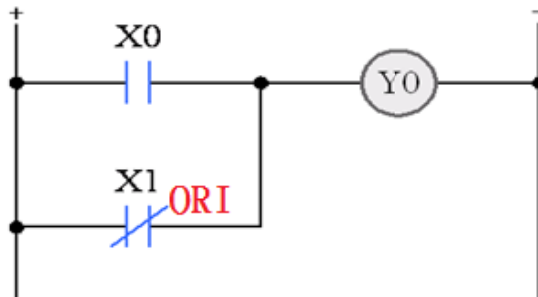
PLC circuit

PLC program

# AND/ANI/OR/ORI



0	LD	X0
1	OR	X1
2	OUT	Y0
3	END	



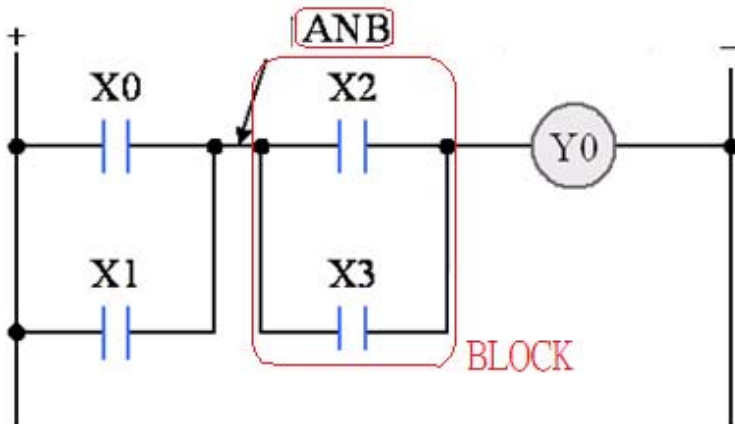
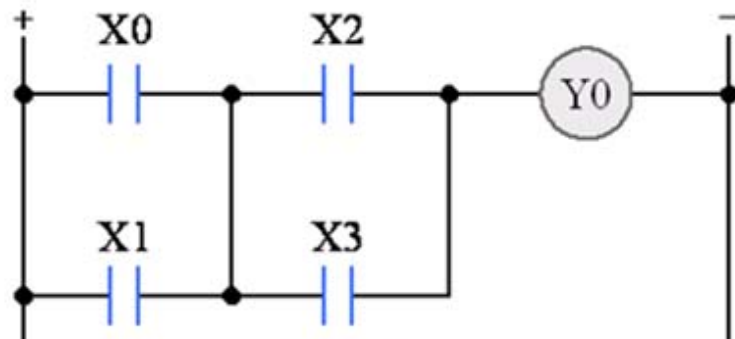
0	LD	X0
1	ORI	X1
2	OUT	Y0
3	END	

PLC circuit

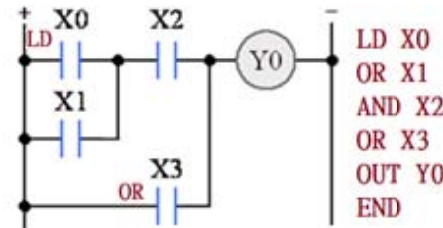
PLC program



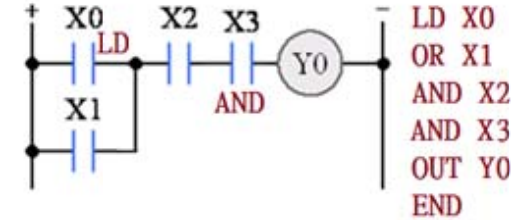
# ANB/ORB



PLC circuit



```
LD X0
OR X1
AND X2
OR X3
OUT Y0
END
```

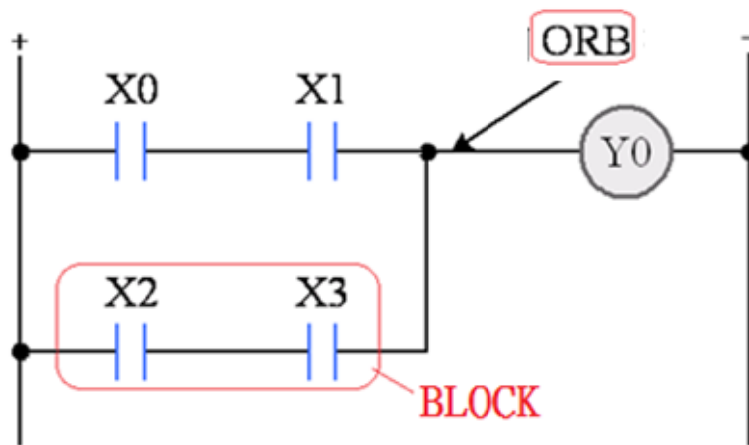
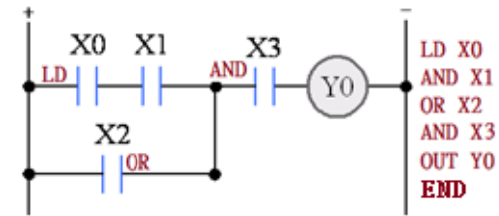
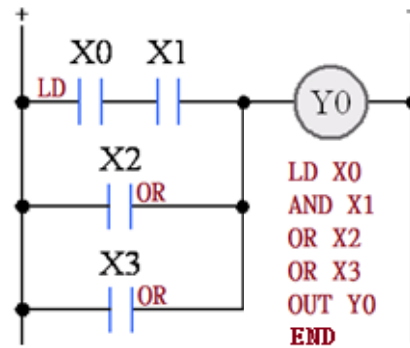


```
LD X0
OR X1
AND X2
AND X3
OUT Y0
END
```

0	LD	X0
1	OR	X1
2	LD	X2
3	OR	X3
4	ANB	
5	OUT	Y0
6	END	

PLC program

# ANB/ORB



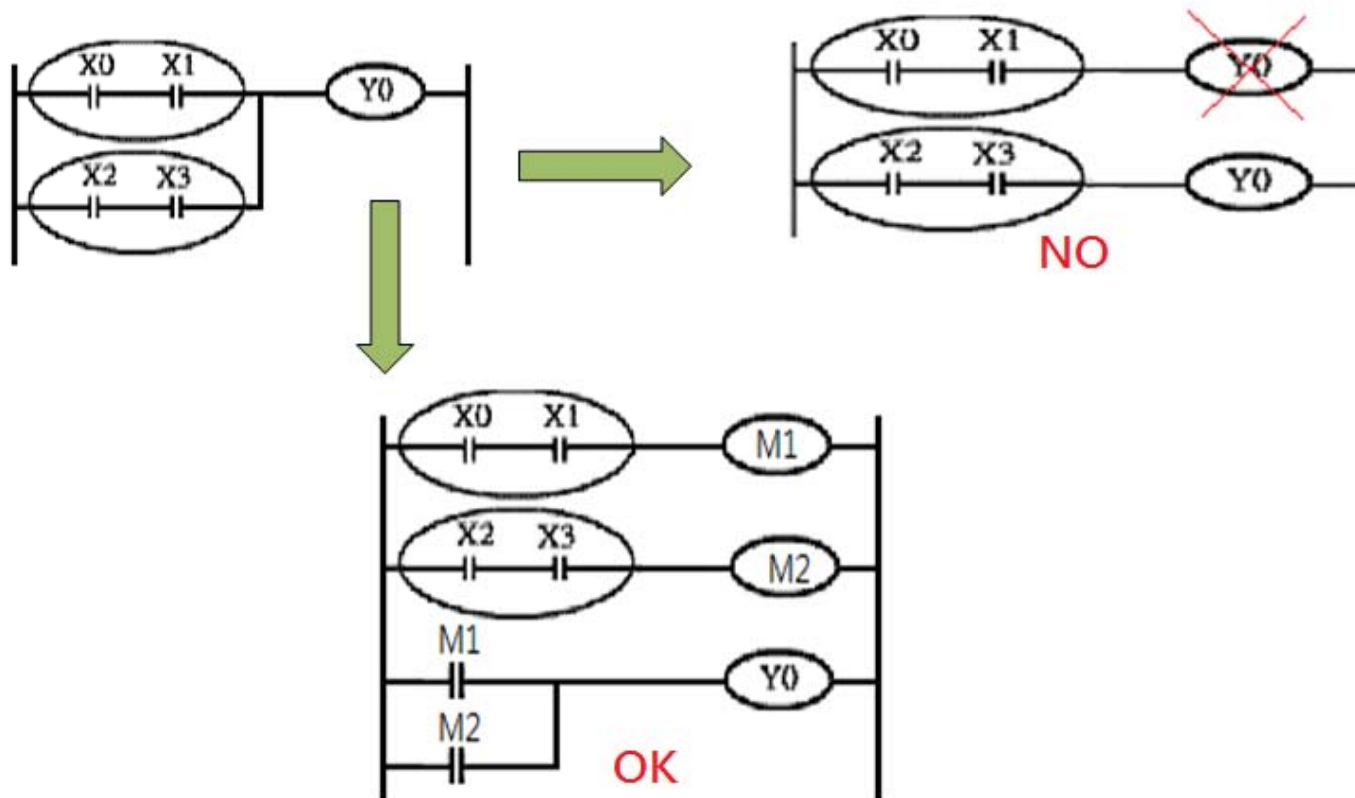
PLC circuit

0	LD	X0
1	AND	X1
2	LD	X2
3	AND	X3
4	ORB	
5	OUT	Y0
6	END	

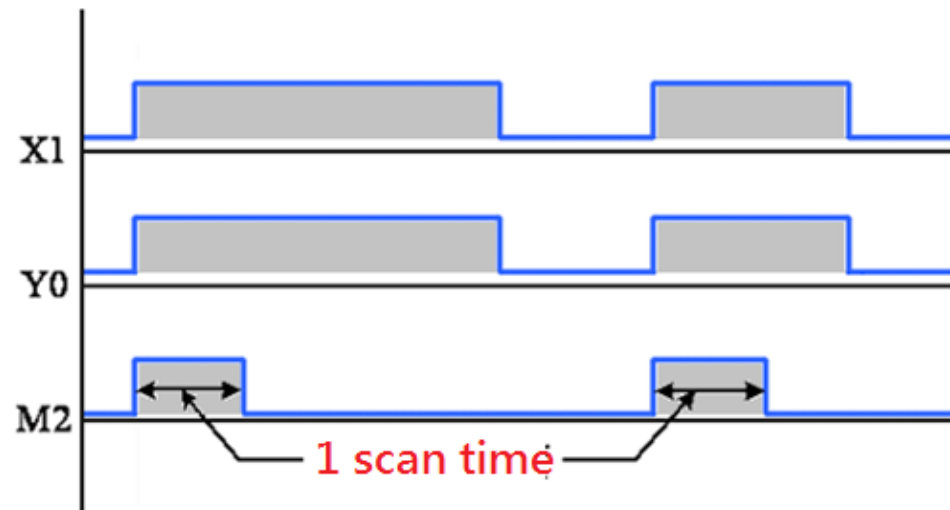
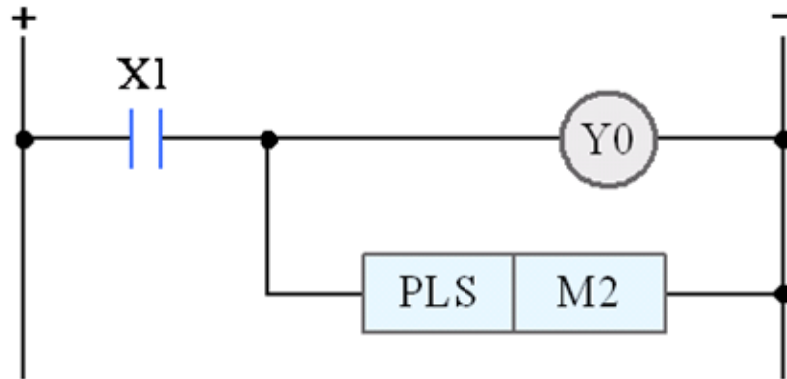
PLC program

# The output cannot be repeated

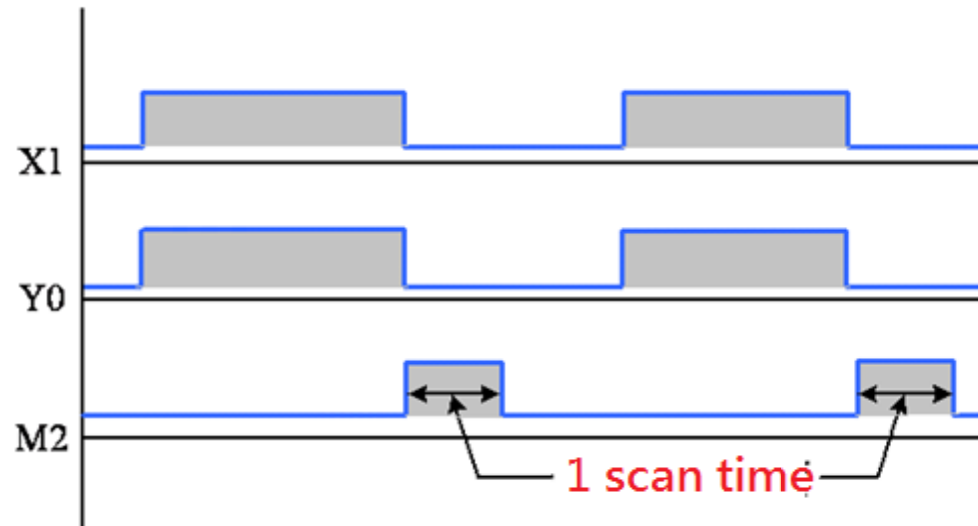
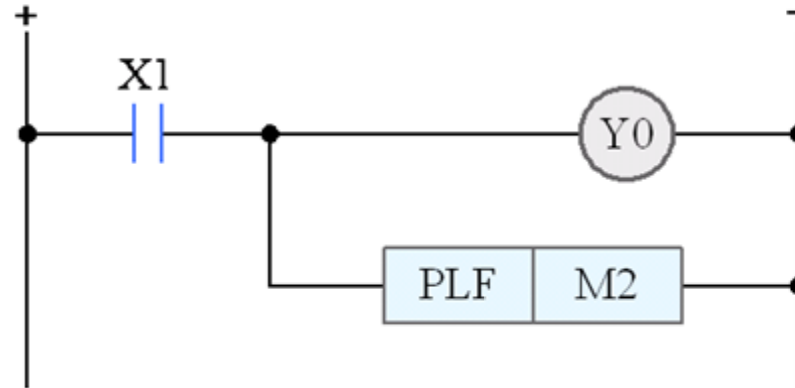
## Output tidak dapat diulang



# PLS/PLF

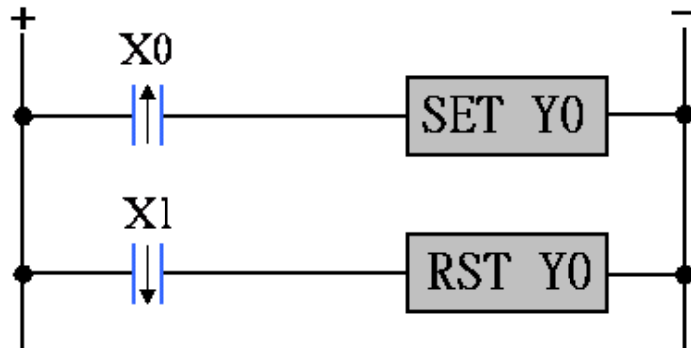


# LDP/LDF(ORP/ORF)

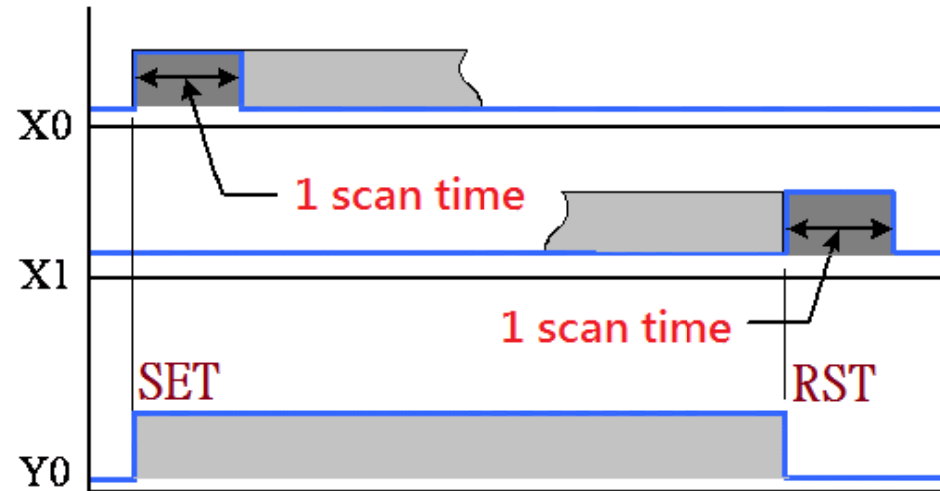




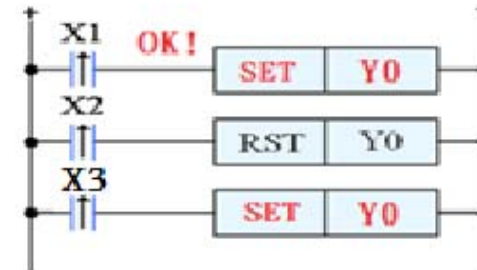
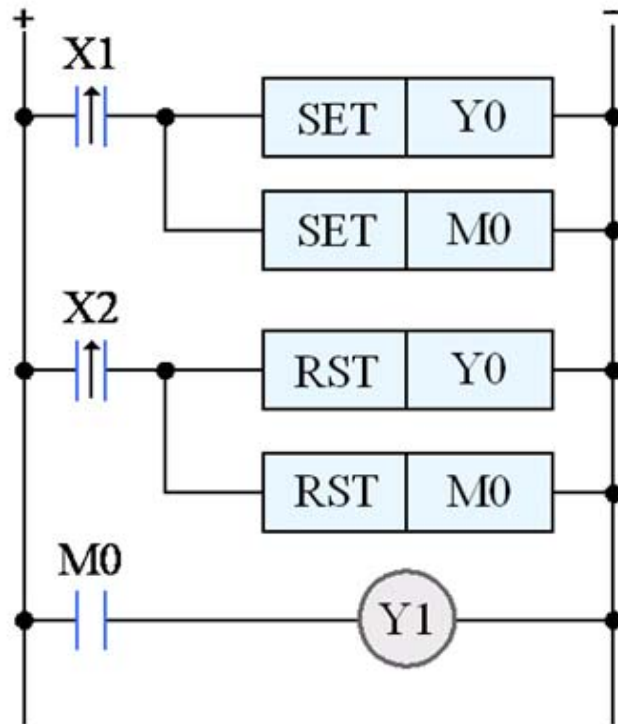
# SET/RST



0	LDP	X0
1	SET	Y0
2	LDF	X1
3	RST	Y0
4	END	

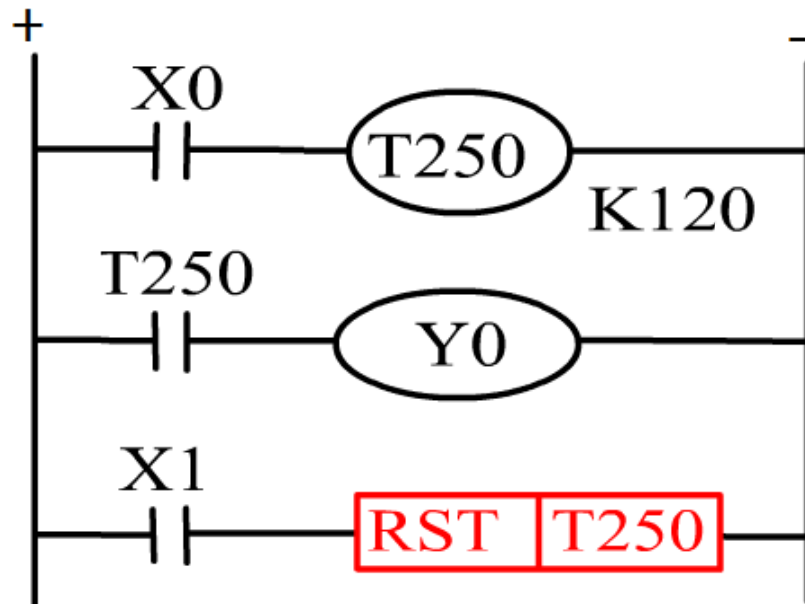


# SET/RST



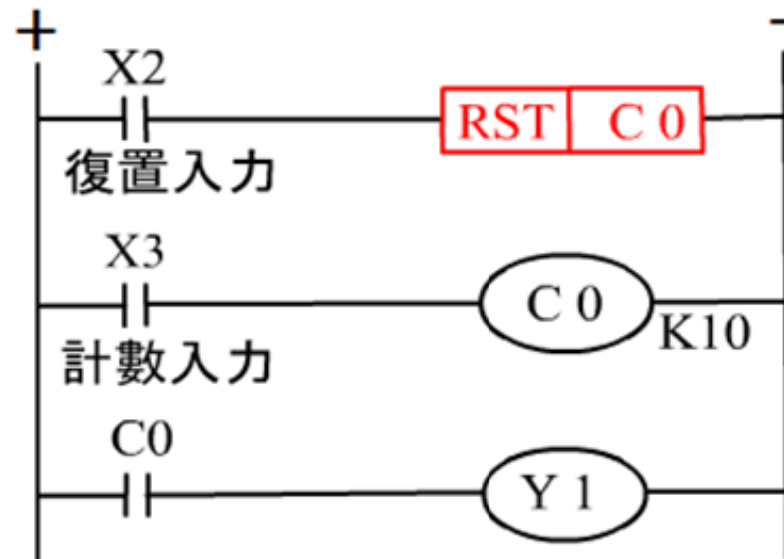
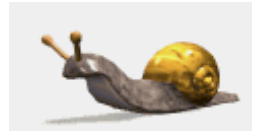
0	LDI	X1
1	SET	Y0
2	SET	M0
3	LDI	X2
4	RST	Y0
5	RST	M0
6	LD	M0
7	OUT	Y1
8	END	

# RST



```
0 LD X0
1 OUT T250
  SP K120
4 LD T250
5 OUT Y0
6 LD X1
7 RST T250
9 END
```

# RST



```
0 LD X2
1 RST C0
3 LD X3
4 OUT C0
  SP K10
7 LD C0
8 OUT Y1
9 END
```

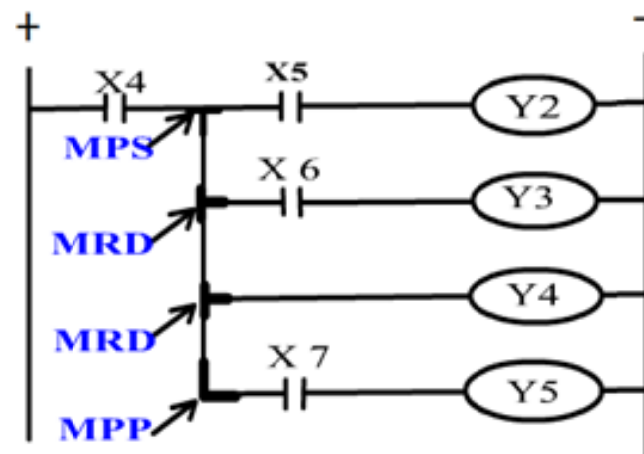
# MPS/MRD/MPP



**MPS** MEMORY PUSH

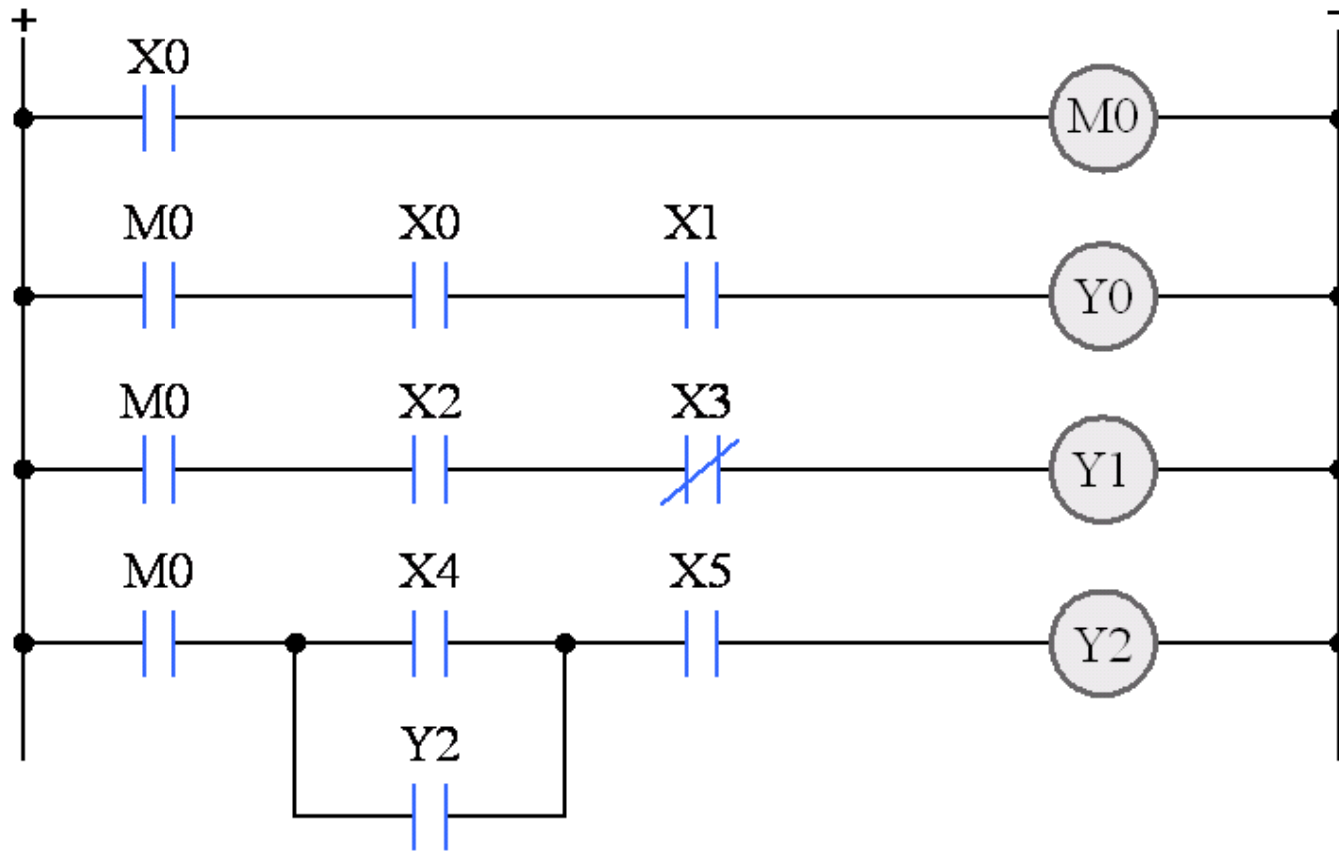
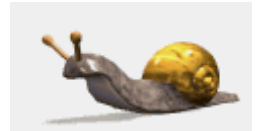
**MRD** MEMORY READ

**MPP** MEMORY POP

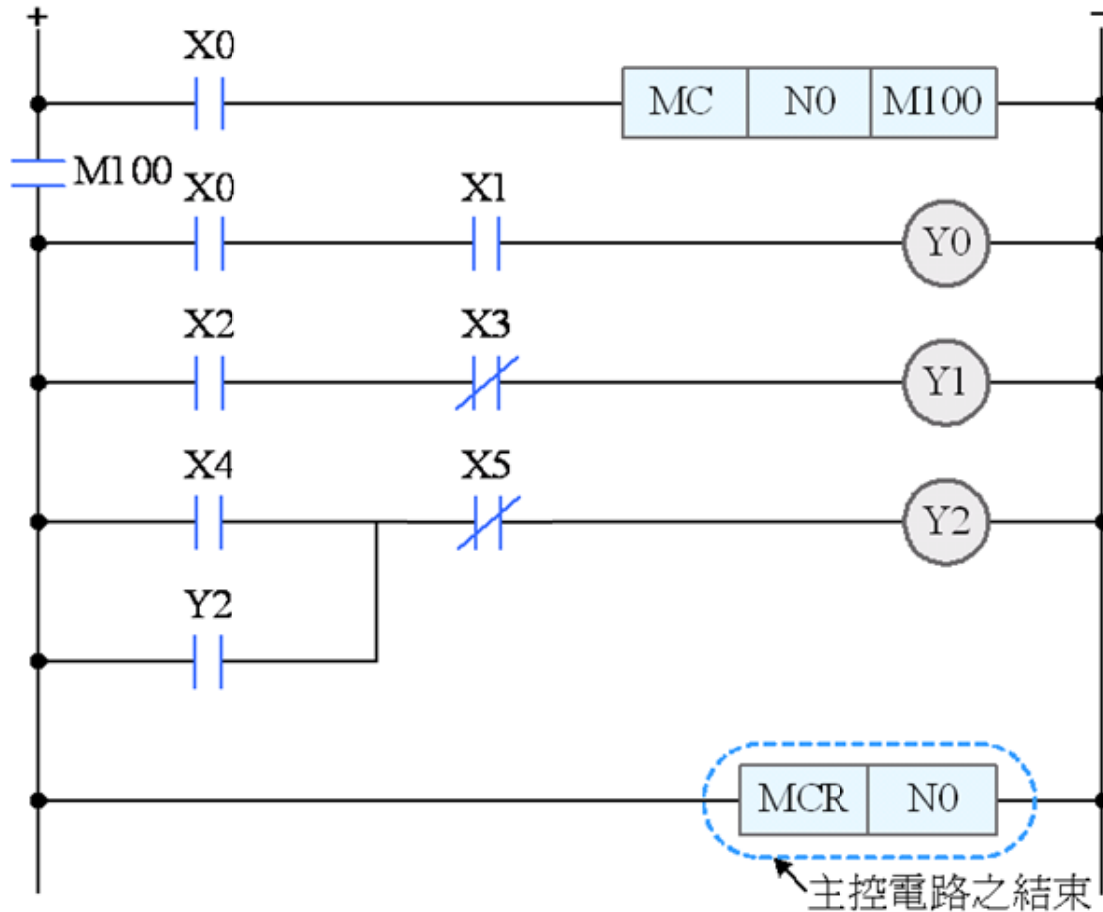
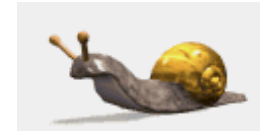


步序	命 令
18	LD X4
19	MPS
20	AND X5
21	OUT Y2
22	MRD
23	AND X6
24	OUT Y3
25	MRD
26	OUT Y4
27	MPP
28	AND X7
29	OUT Y5

# MC/MCR



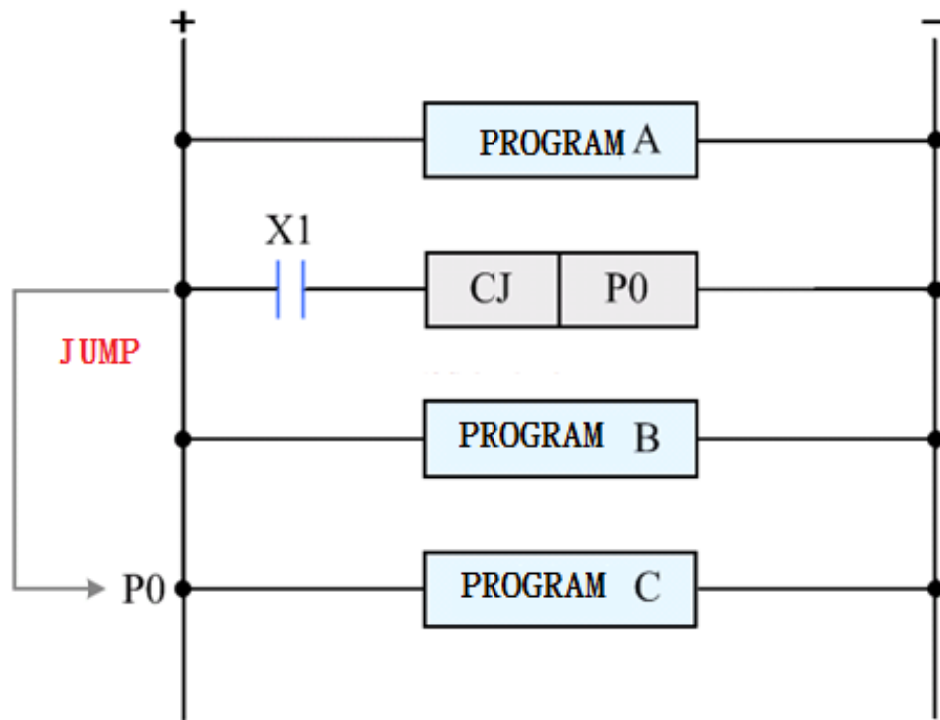
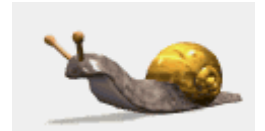
# MC/MCR



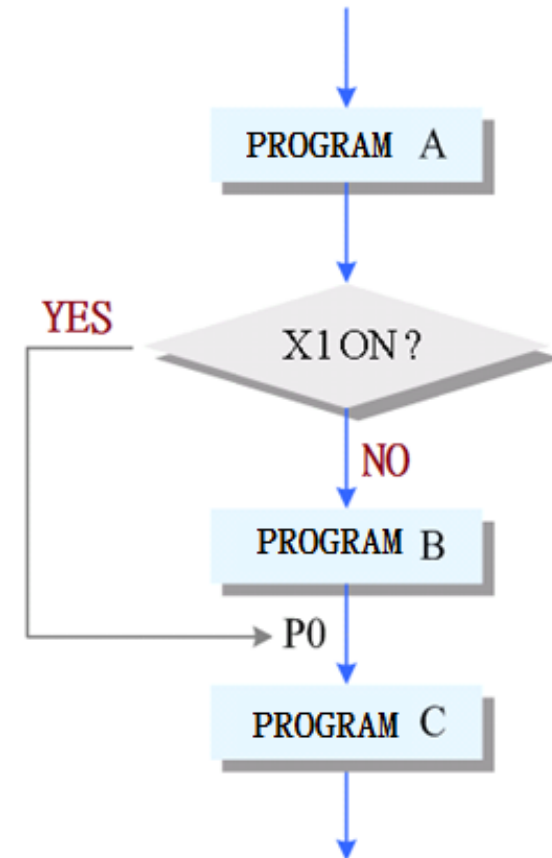
```
LD X0  
MC (N)0 M100  
LD X0  
AND X1  
OUT Y0  
LD X2  
ANI X3  
OUT Y1  
LD X4  
OR Y2  
ANI X5  
OUT Y2  
MCR (N)0  
END
```

主控電路之結束

# CJ(FNC 0)

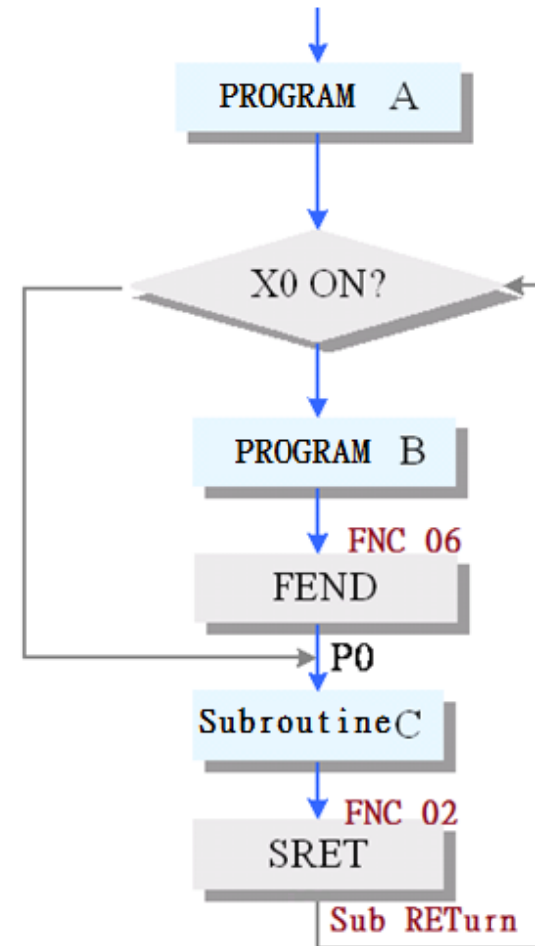
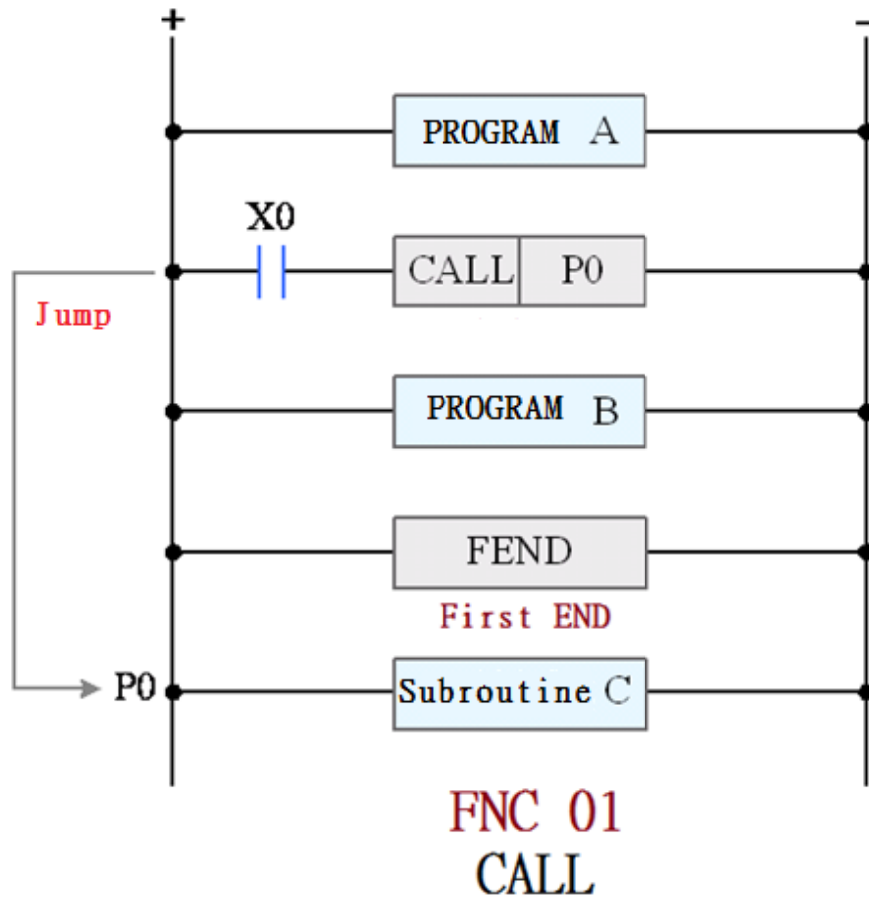
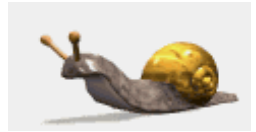


FNC 00  
CJ (Condition Jump)

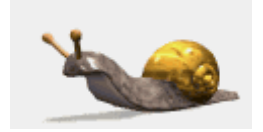




# CALL



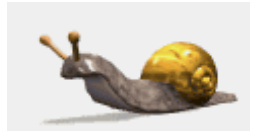
# NOP



## No Operation

- 1. Can be used to insert blank lines to maintain program length**
- 2. It can be applied to the segmentation of the program**
  - 1. Dapat digunakan untuk menyisipkan baris kosong untuk mempertahankan panjang program**
  - 2. Dapat diterapkan pada segmentasi program**

**END**

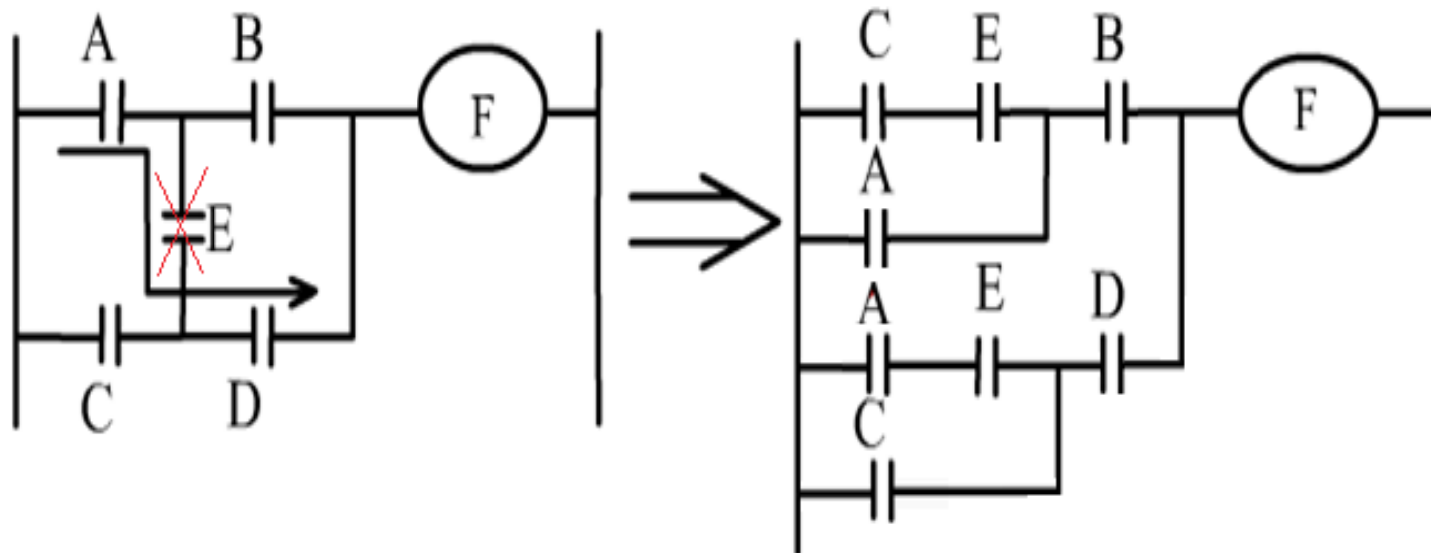
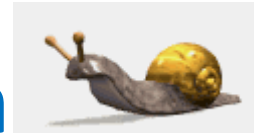


**END**

Program END,Return to step 0

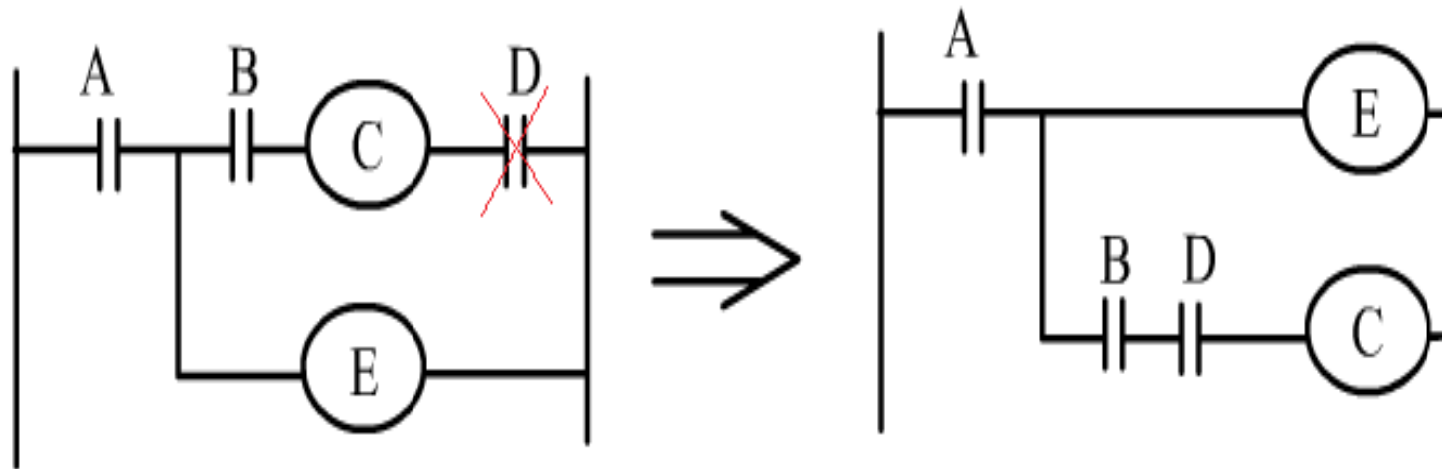
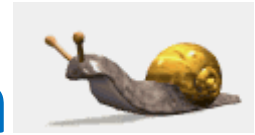
# Matters needing attention when programming

Tindakan pencegahan saat memprogram



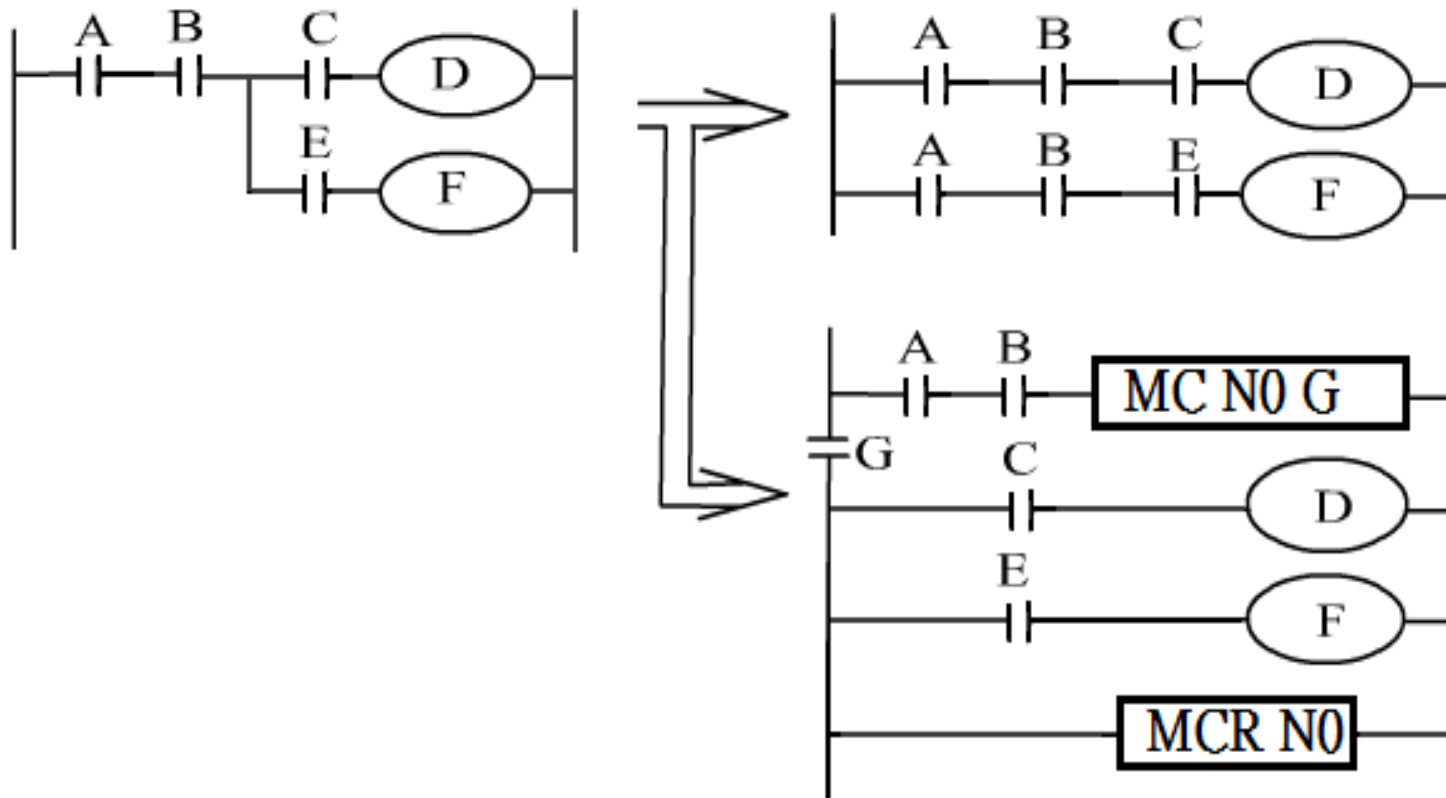
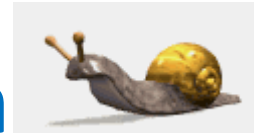
# Matters needing attention when programming

Tindakan pencegahan saat memprogram



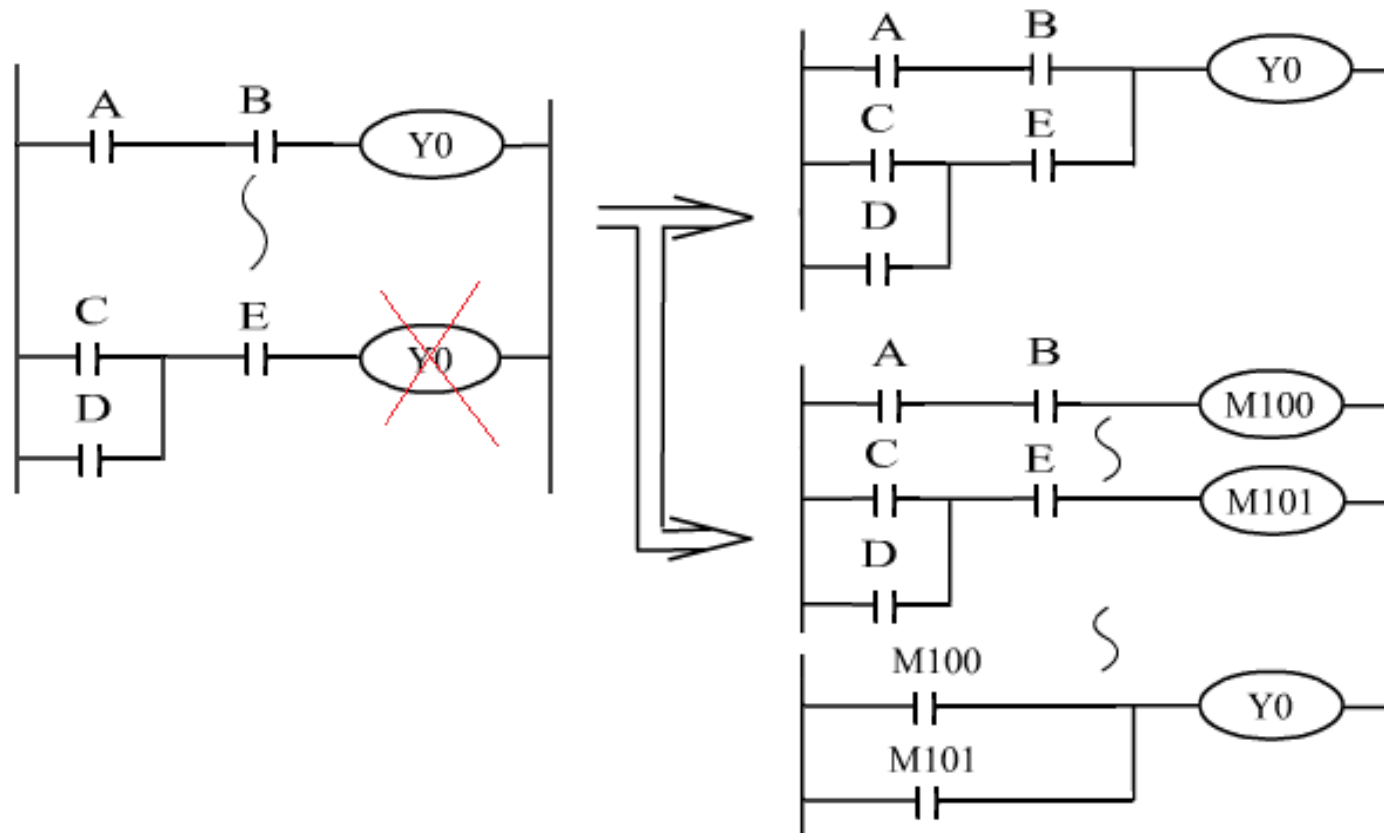
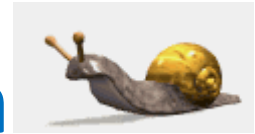
# Matters needing attention when programming

Tindakan pencegahan saat memprogram



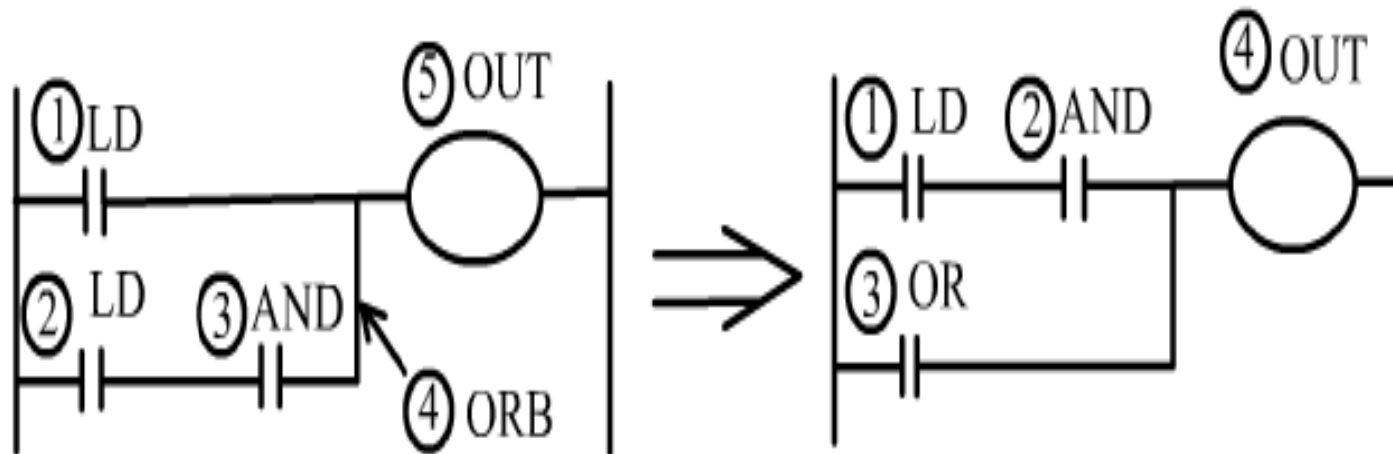
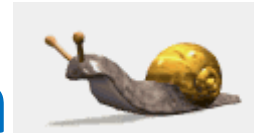
# Matters needing attention when programming

Tindakan pencegahan saat memprogram



# Matters needing attention when programming

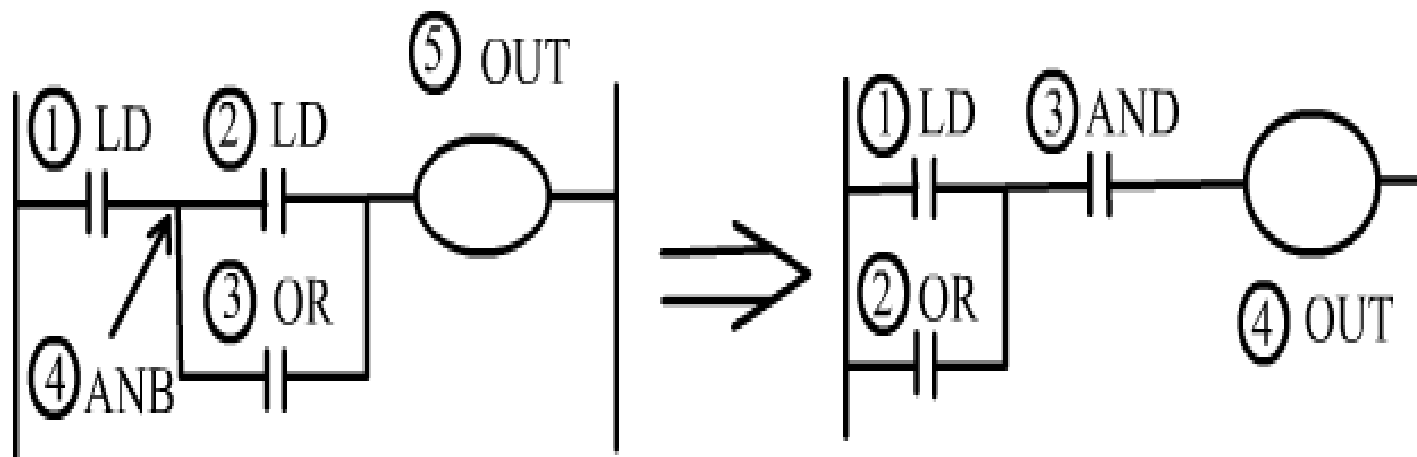
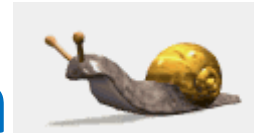
Tindakan pencegahan saat memprogram





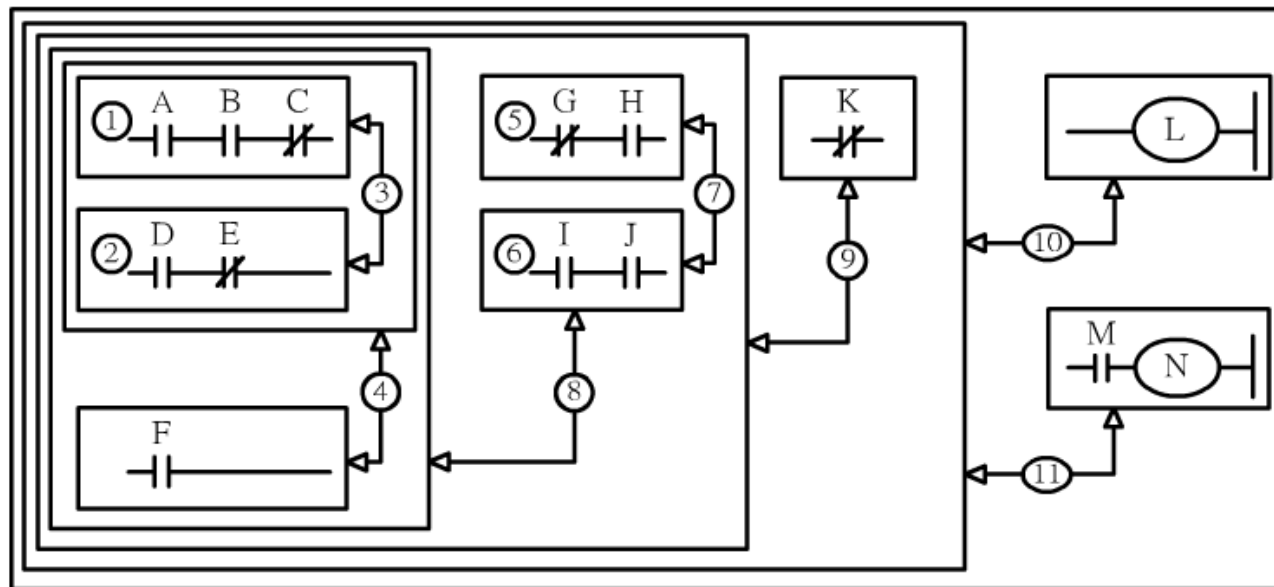
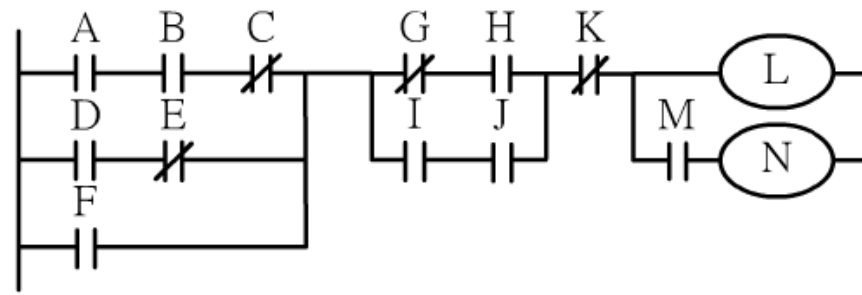
# Matters needing attention when programming

Tindakan pencegahan saat memprogram



# Matters needing attention when programming

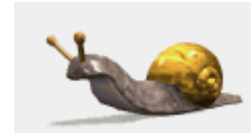
## Tindakan pencegahan saat memprogram



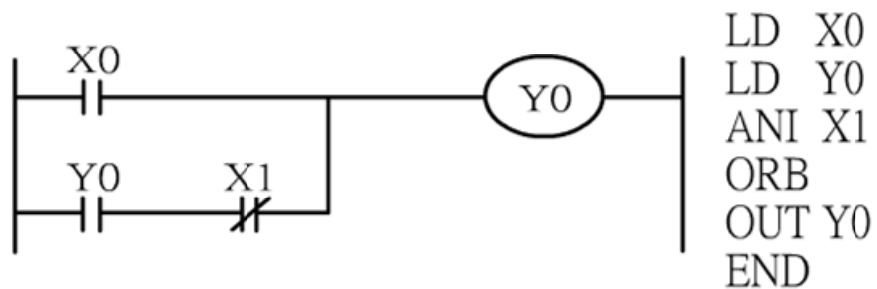
From left to right, From Top to down

# Memory (self-keep) circuit

Sirkuit memori (penyimpanan sendiri)

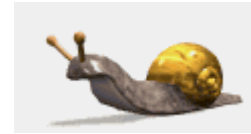


## ON priority

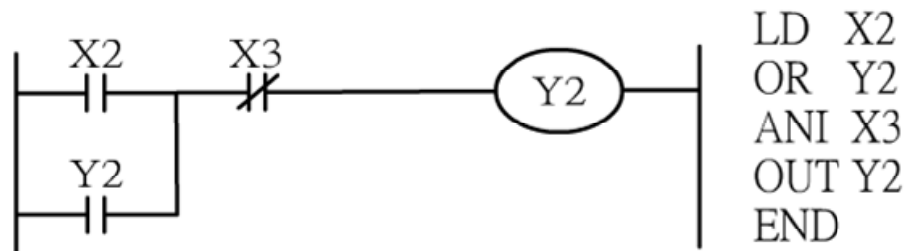


# Memory (self-keep) circuit

Sirkuit memori (penyimpanan sendiri)

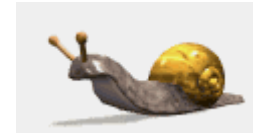


## OFF priority

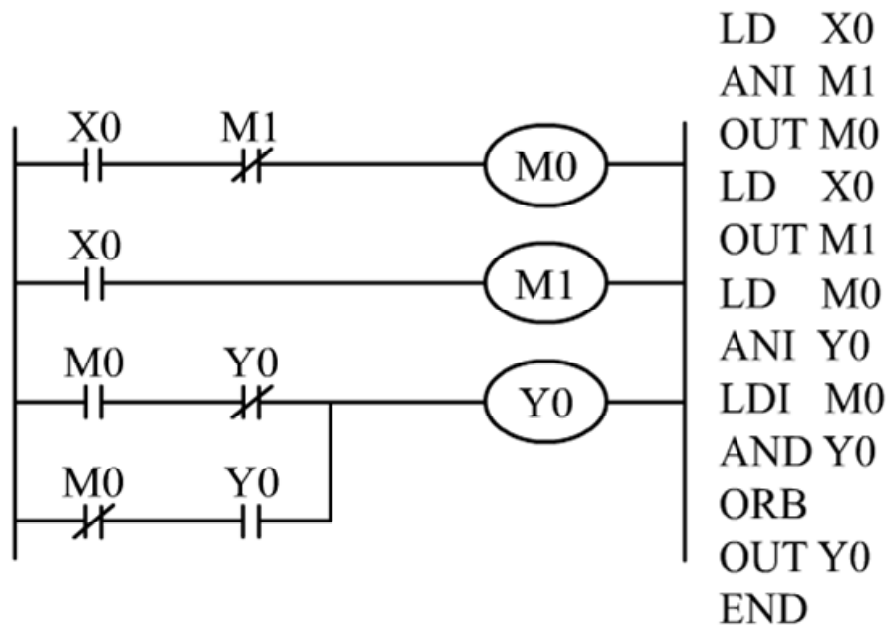


# Memory (self-keep) circuit

Sirkuit memori (penyimpanan sendiri)

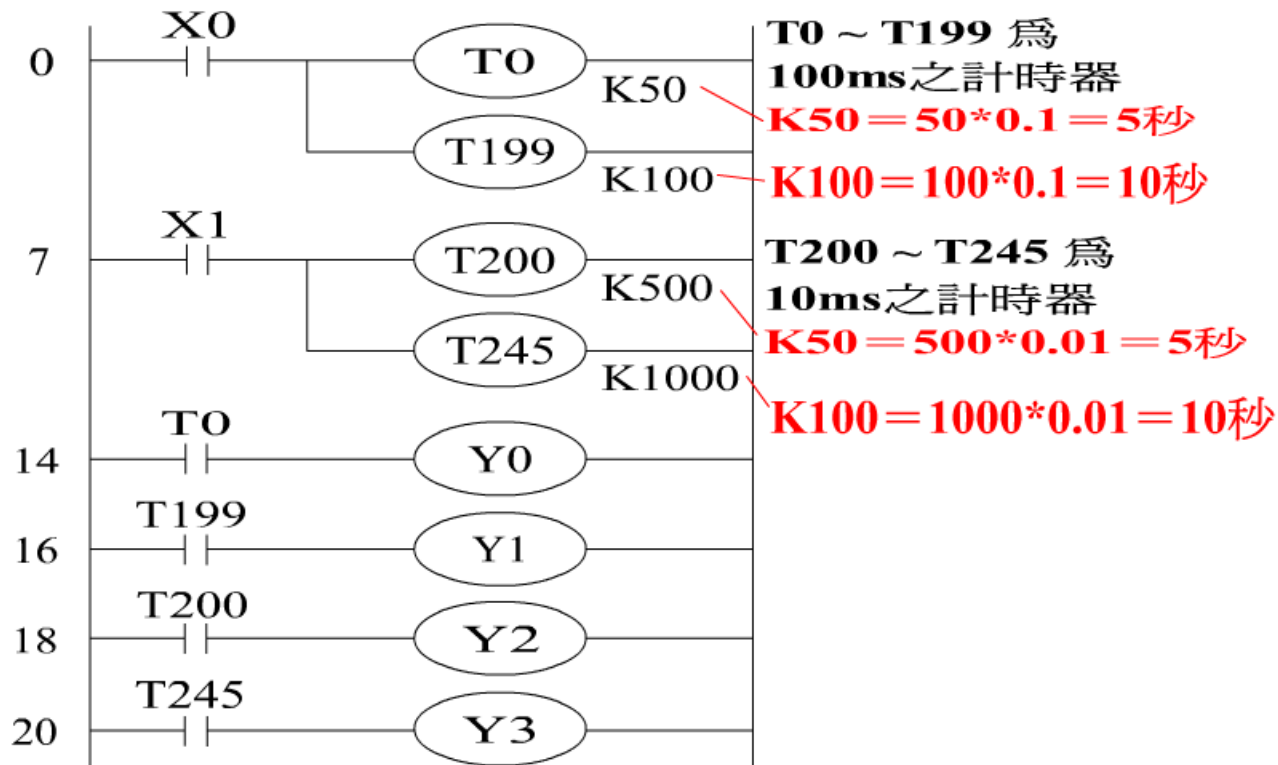


## Single button ON/OFF



# TIMER loop

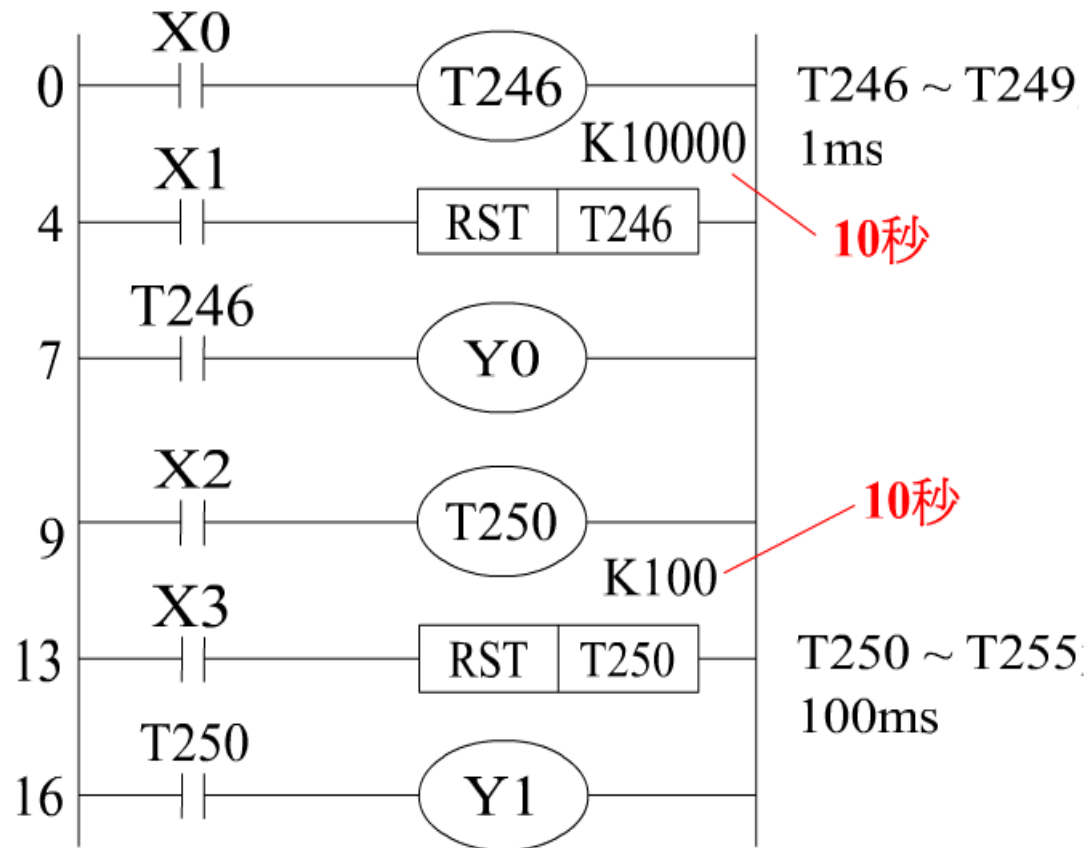
## Timers with different time bases



一般用計時器

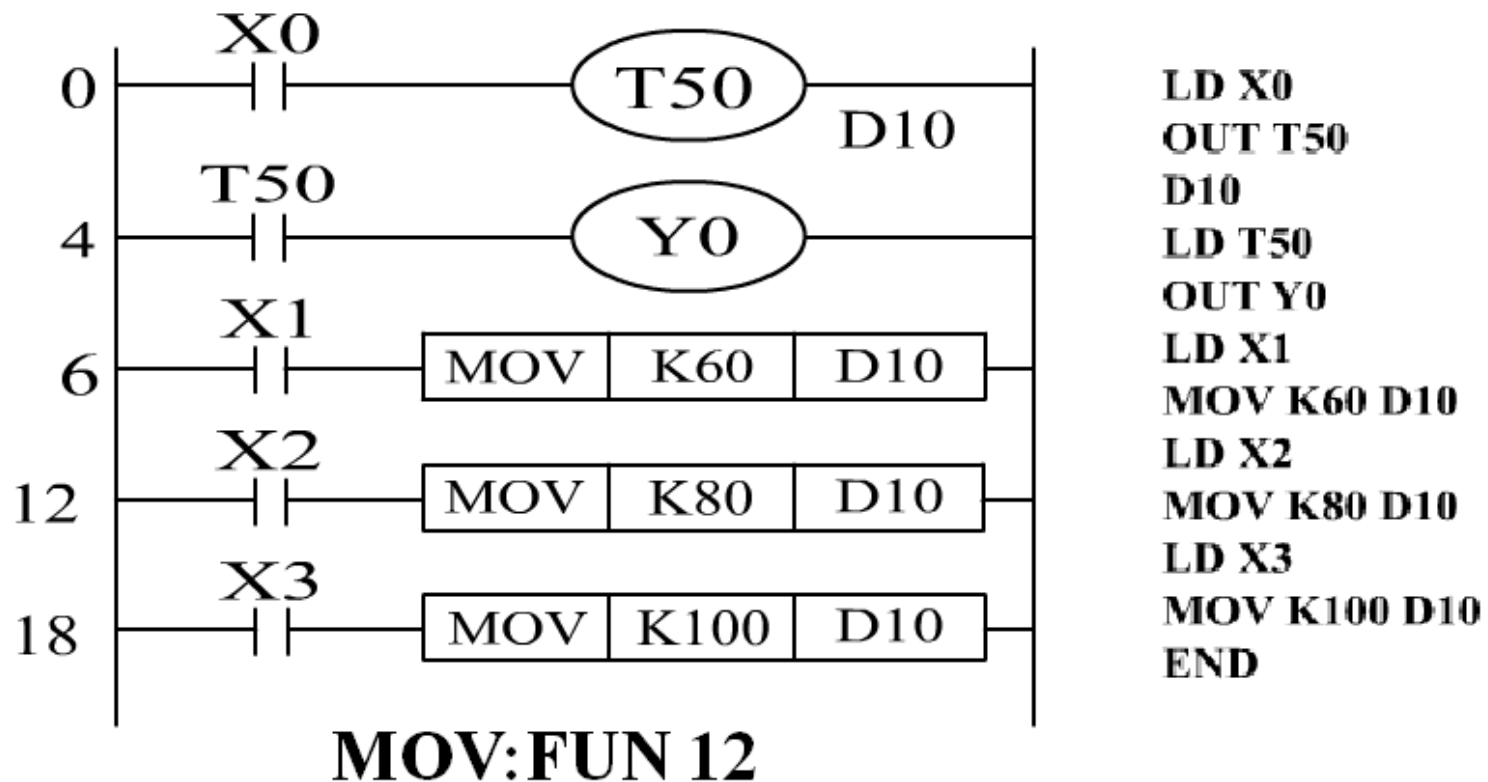
# TIMER loop

## Power failure maintenance timer



# TIMER loop

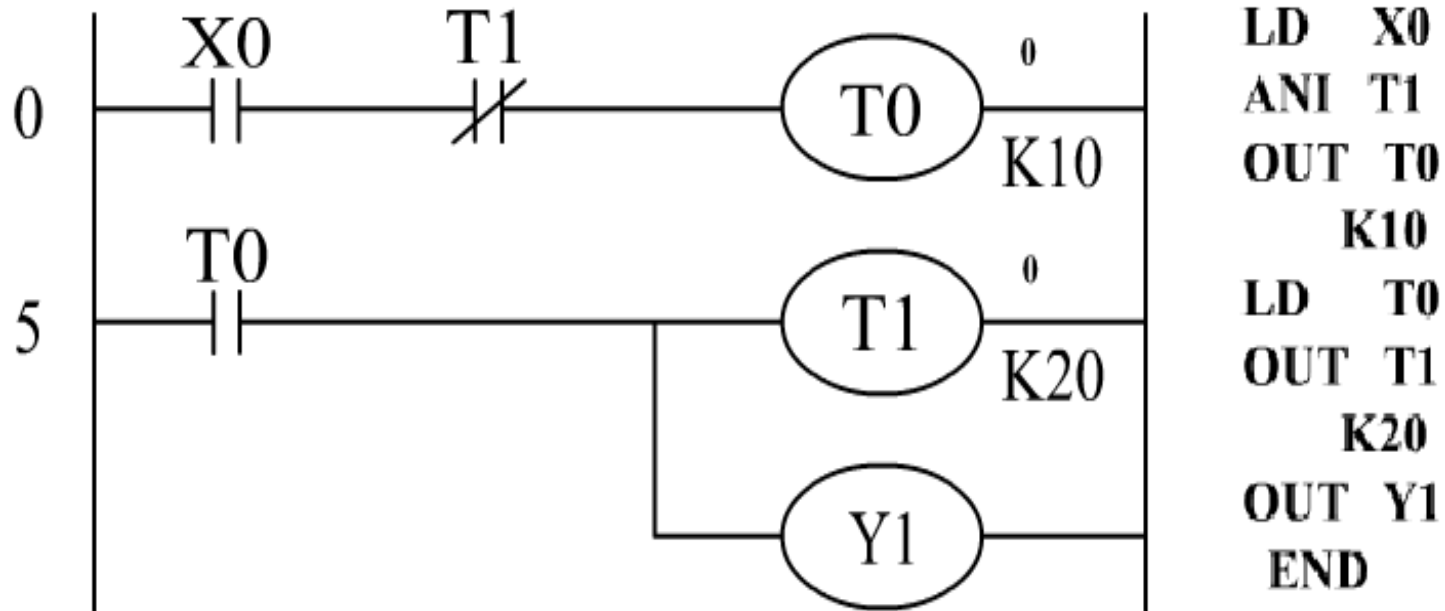
## Set timer indirectly





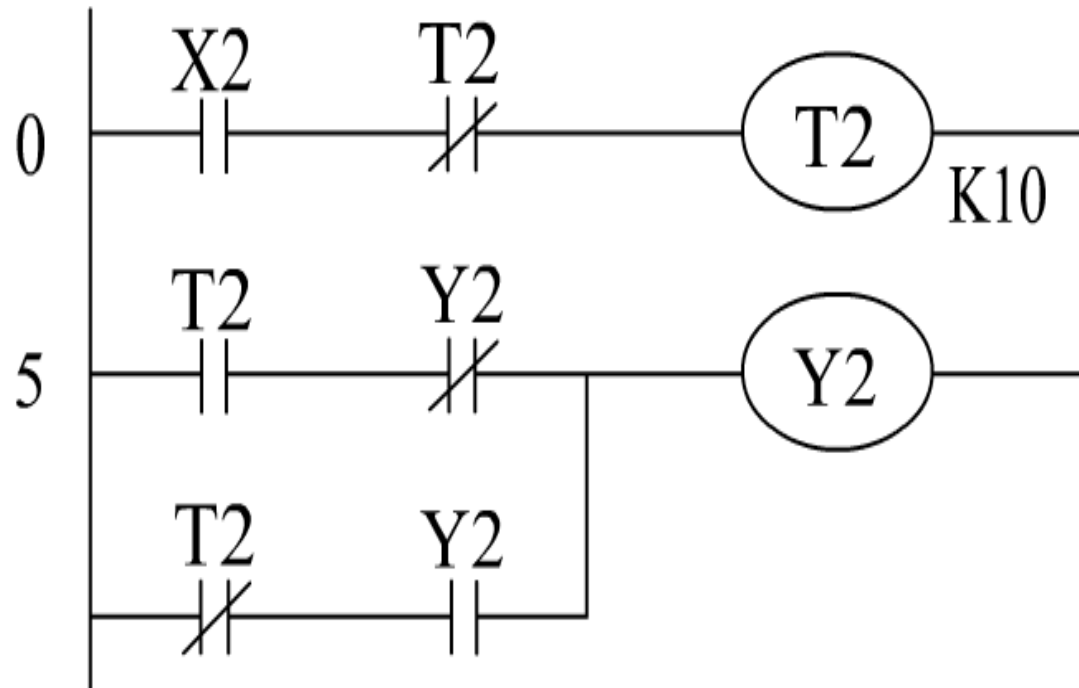
# TIMER loop

## Flash control-1



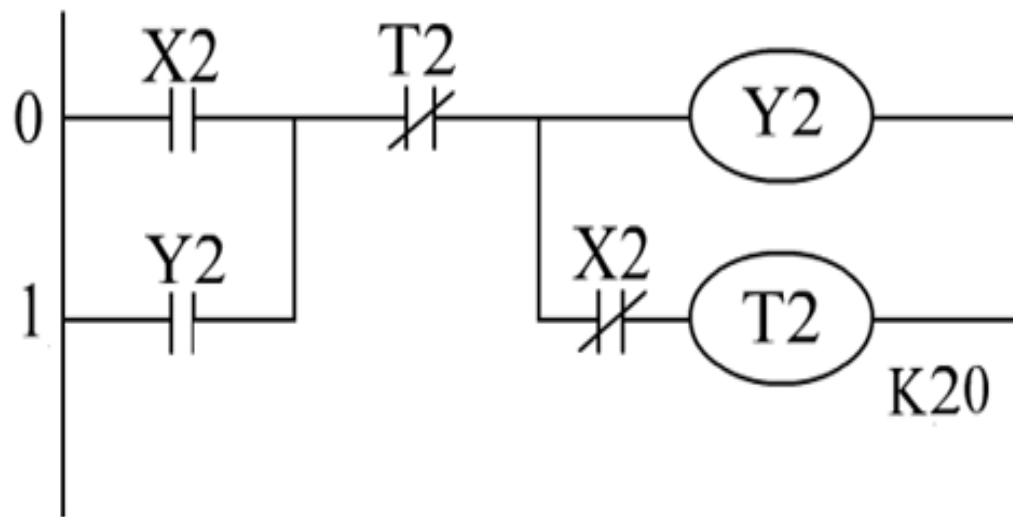
# TIMER loop

## Flash control-2



```
LD X2
ANI T2
OUT T2
    K10
LD T2
ANI Y2
LDI T2
AND Y2
ORB
OUT Y2
END
```

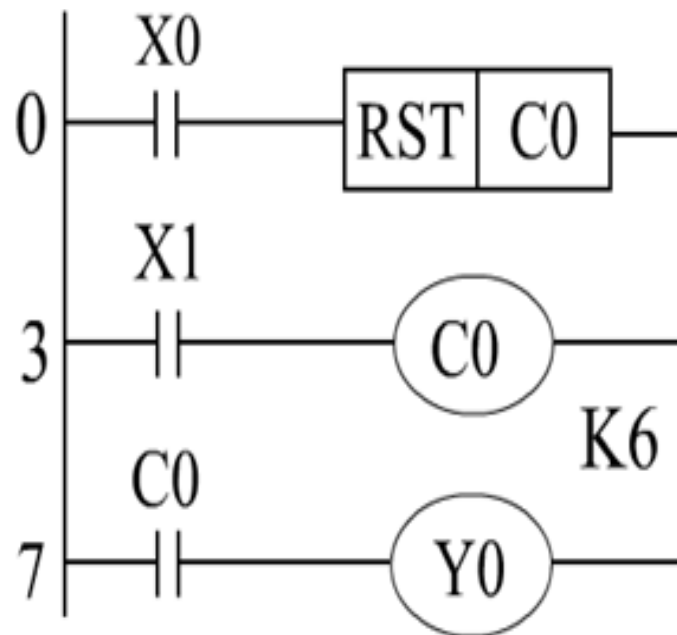
# TIMER loop OFF DELAY



```
LD X2---(0)  
OR Y2---(1)  
ANI T2  
OUT Y2  
ANI X2  
OUT T2  
K20  
END---(8)
```

# COUNTER loop

## Normal Timer



C0爲一般計數器

X0爲復置輸入

X1爲計數輸入

**LD X0---**(0)

**RST C0**

**LD X1---**(3)

**OUT C0 K6**

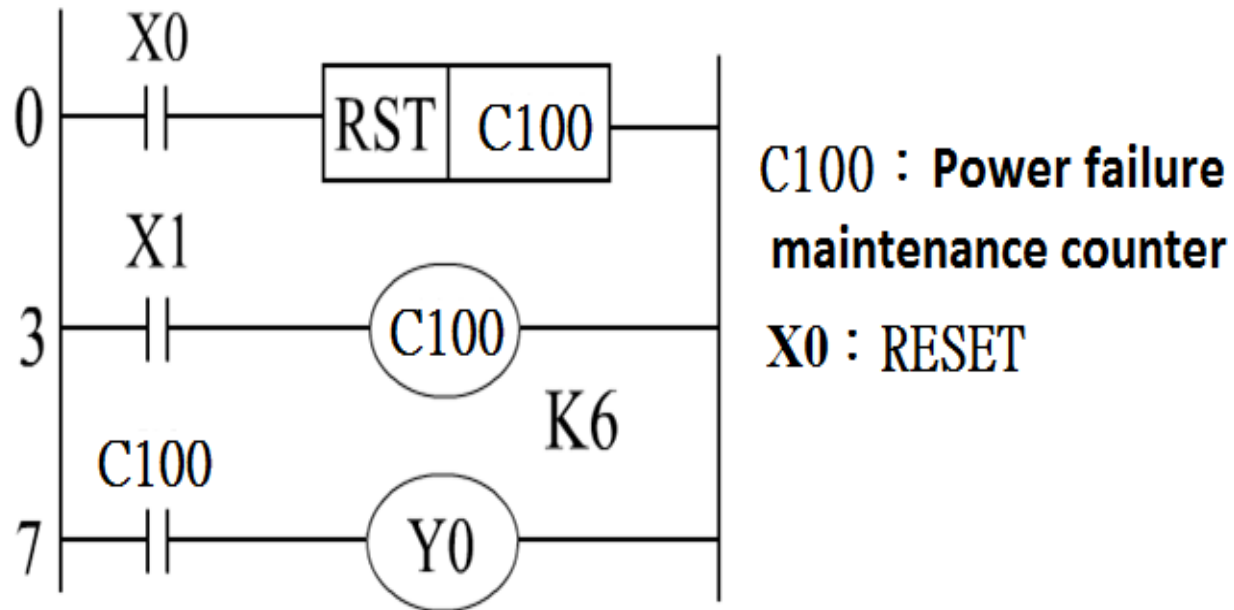
**LD C0---**(7)

**OUT Y0**

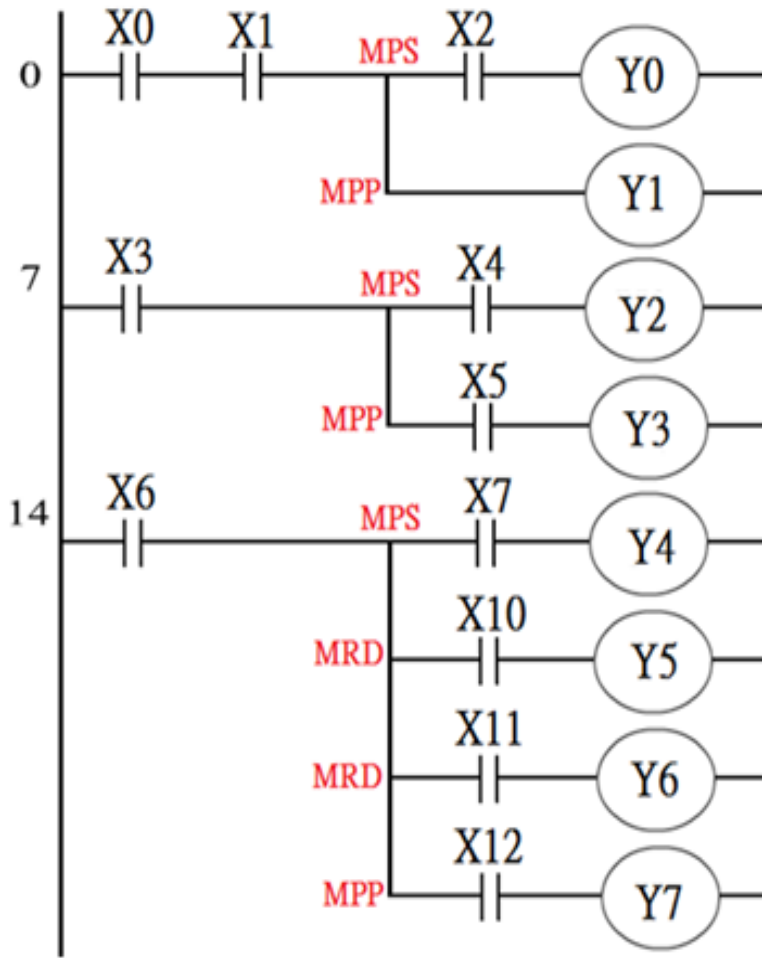
**END**

# COUNTER loop

## Power failure maintenance counter



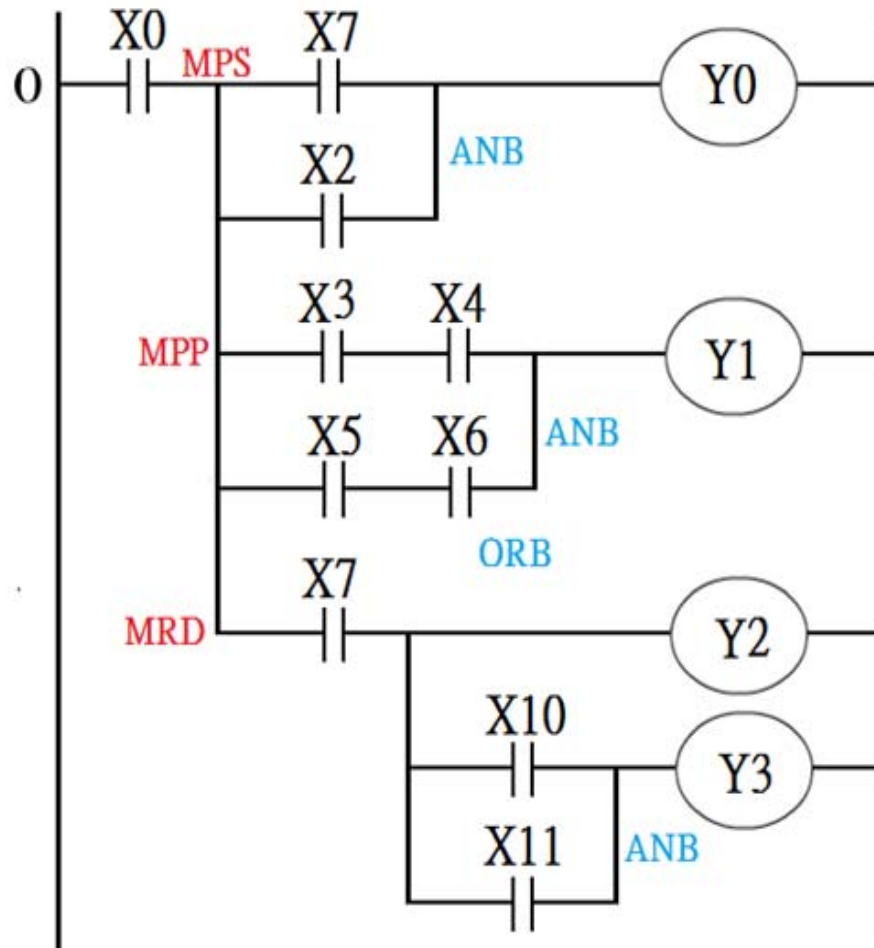
# MPS MRD MPP loop



```

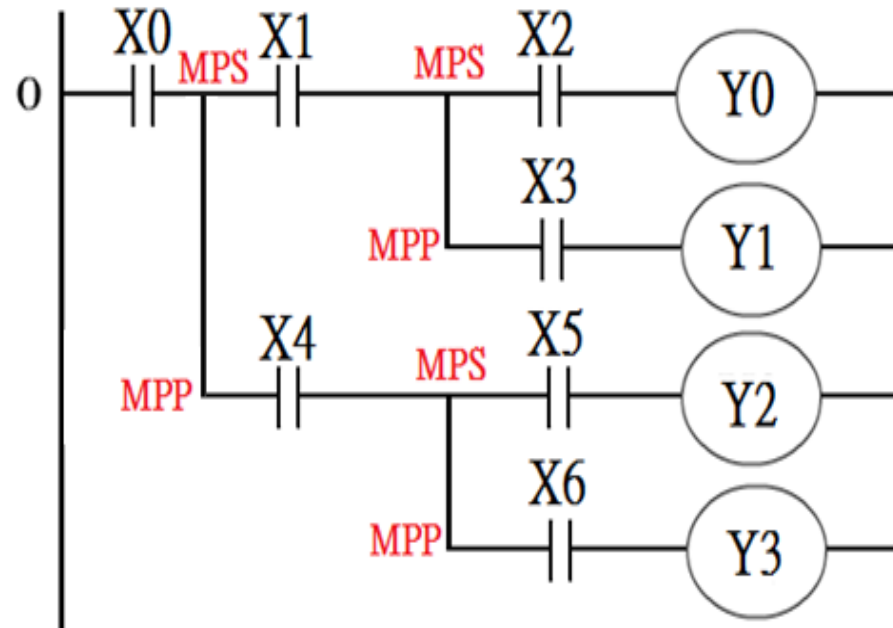
LD X0---(0)
AND X1
MPS           MPS
AND X2       AND X7
OUT Y0       OUT Y4
MPP          MRD
OUT Y1       AND X10
LD X3---(7)  OUT Y5
MPS         MRD
AND X4      AND X11
OUT Y2      OUT Y6
MPP         MPP
AND X5      AND X12
OUT Y3      OUT Y7
LD X6---(14) END
  
```

# MPS MRD MPP loop



LD X0	ORB
MPS	ANB
LD X1	OUT Y1
OR X2	MPP
ANB	AND X7
OUT Y0	OUT Y2
MRD	LD X10
LD X3	OR X11
AND X4	ANB
LD X5	OUT Y3
AND X6	END

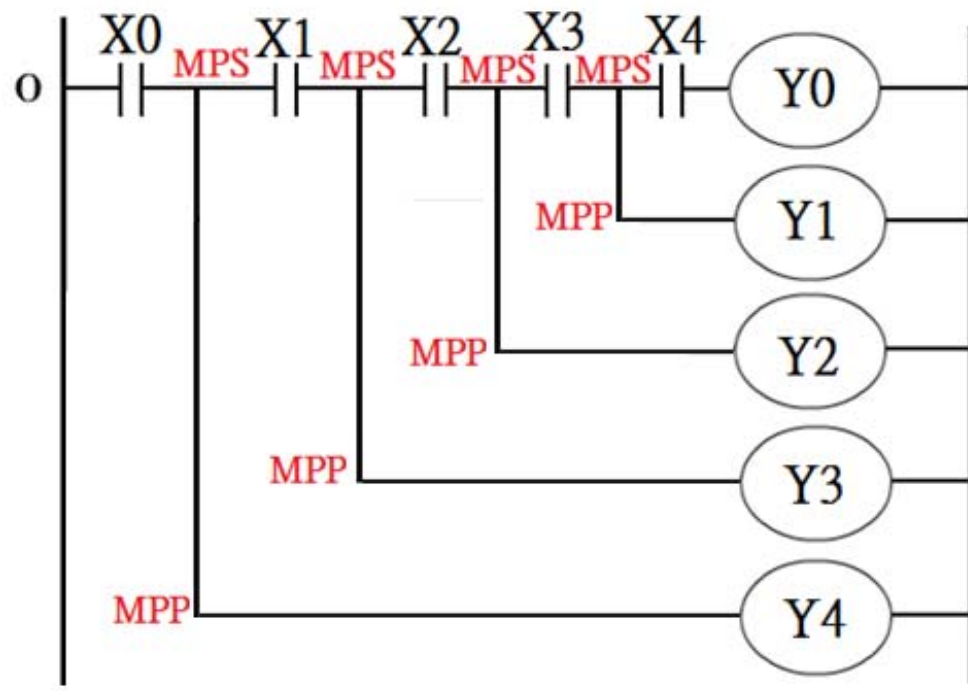
# MPS MRD MPP loop



```
LD X0      MPP
MPS        AND X4
AND X1     MPS
MPS        AND X5
AND X2     OUT Y2
OUT Y0     MPP
MPP        AND X6
AND X3     OUT Y3
OUT Y1     END
```



# MPS MRD MPP loop

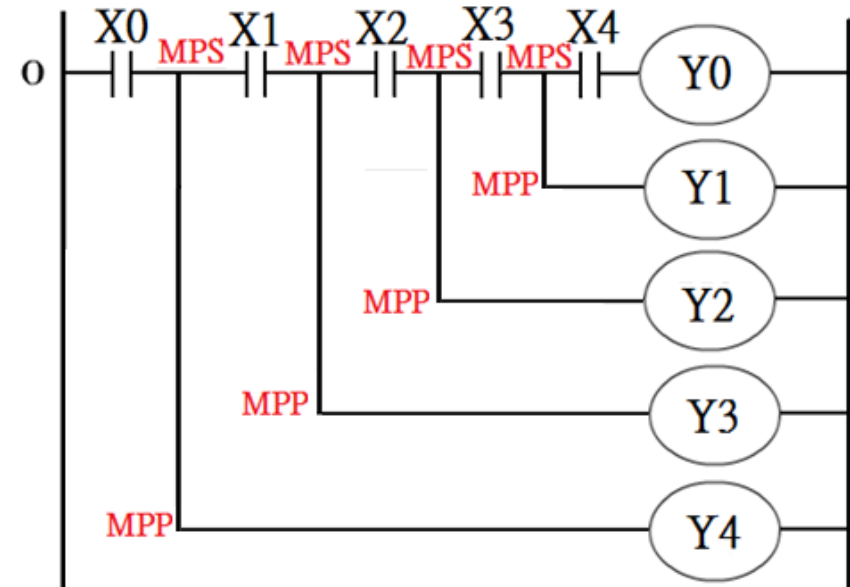
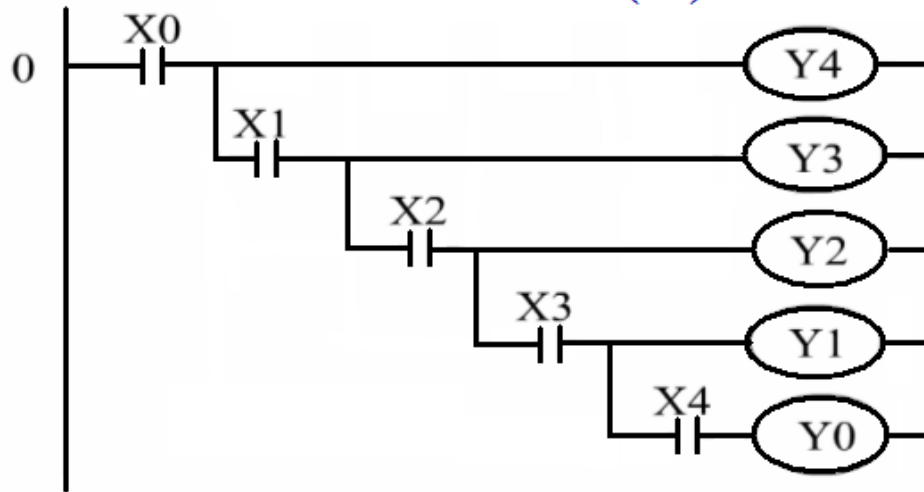


```
LD X0      MPP
MPS        OUT Y1
AND X1     MPP
MPS        OUT Y2
AND X2     MPP
MPS        OUT Y3
AND X3     MPP
MPS        OUT Y4
AND X4     END
OUT Y0
```

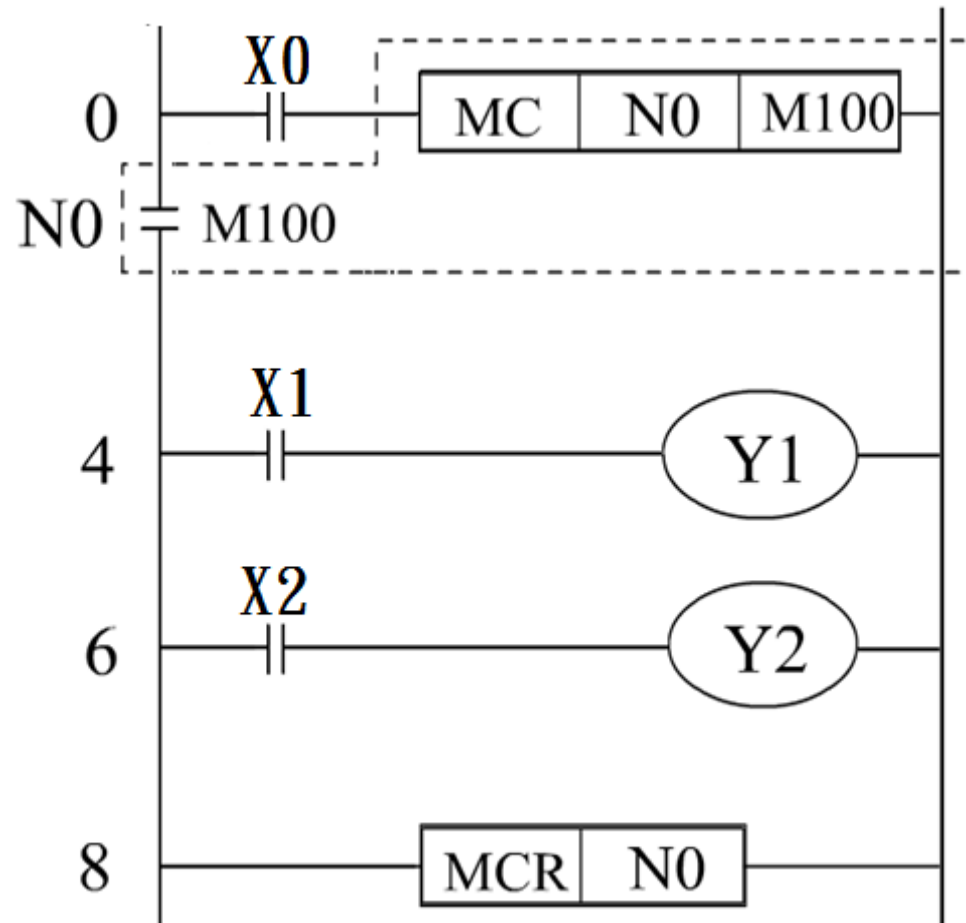
# ptimal modification

## Modifikasi optimal

- RUN
- ON X0 SEE Y4(on)
- ON X1 SEE Y3(on)
- ON X2 SEE Y2(on)
- ON X3 SEE Y1(on)
- ON X4 SEE Y0(on)



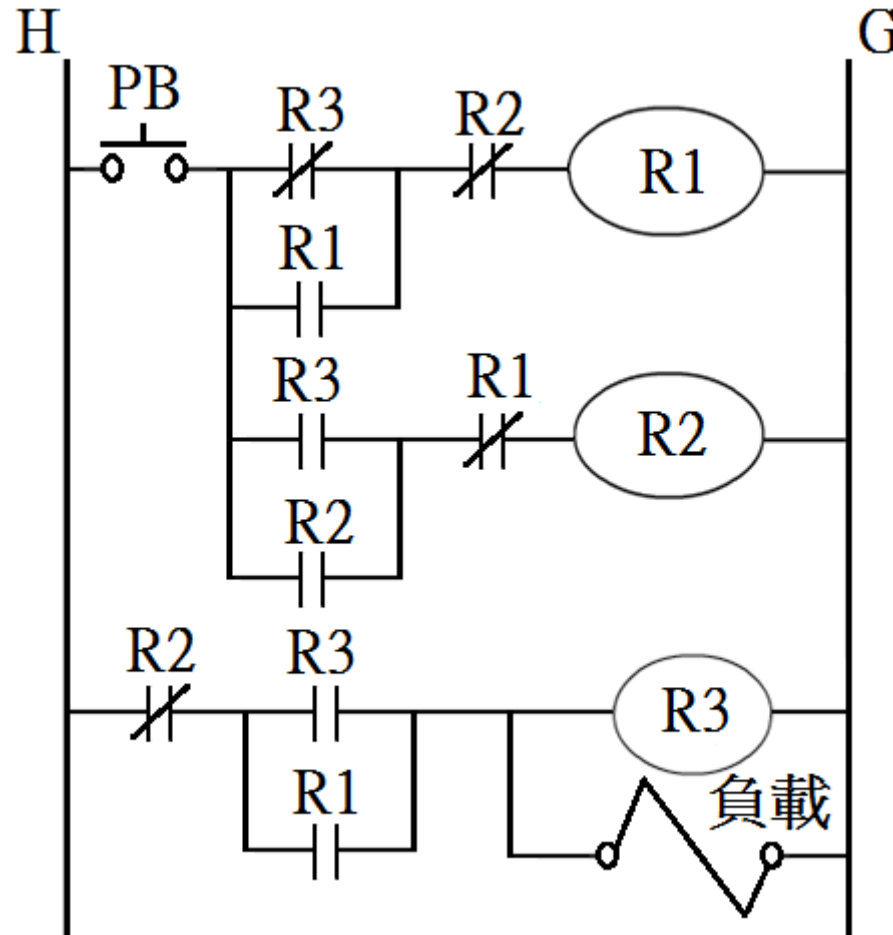
# MC MCR



```
LD X0  
MC (N)0  
SP M100  
LD X1  
OUT Y1  
LD X2  
OUT Y2  
MCR (N)0  
END
```

# Single button ON/OFF circuit

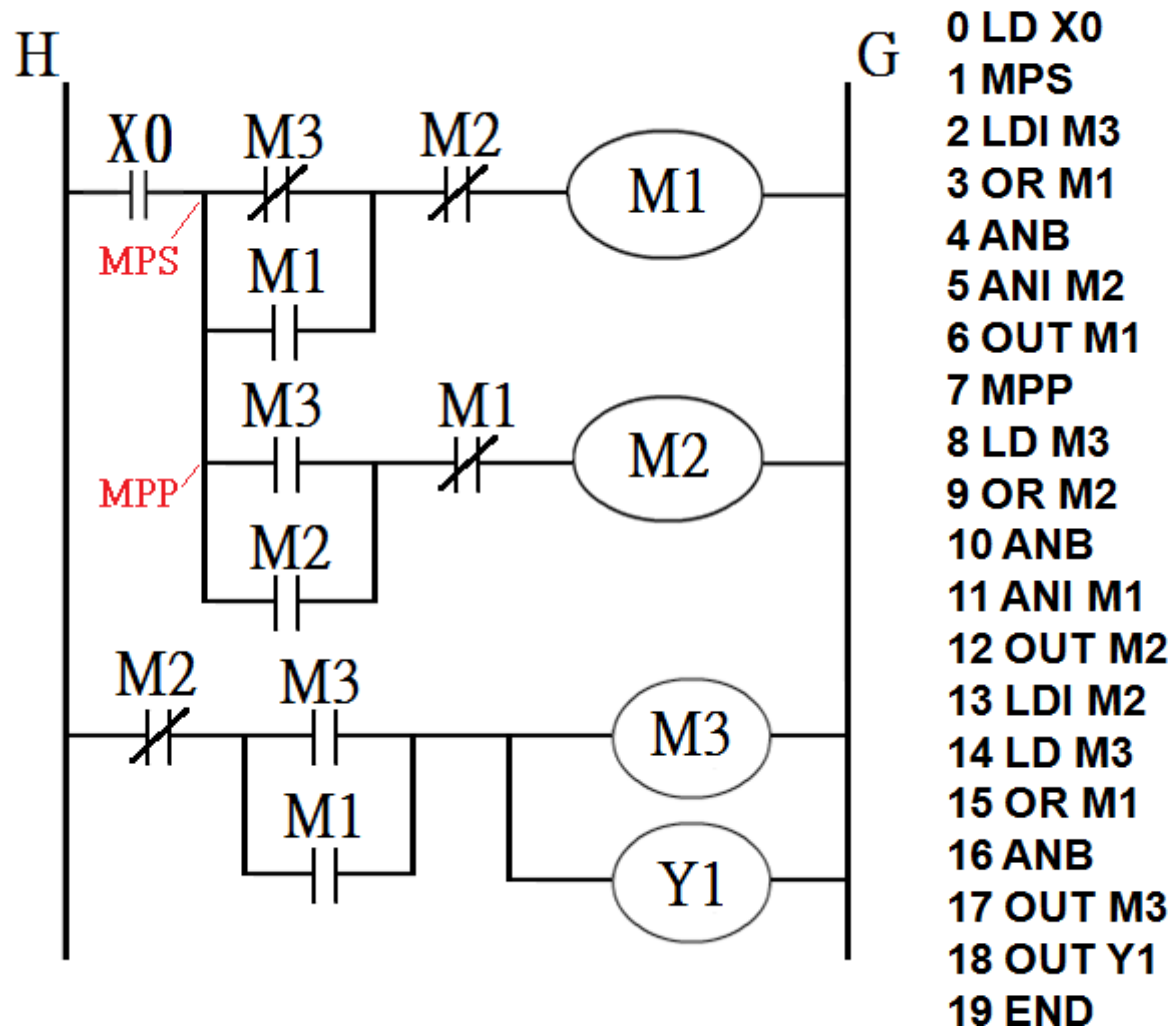
## Sirkuit ON / OFF tombol tunggal



# Single button ON/OFF circuit

## Sirkuit ON / OFF tombol tunggal

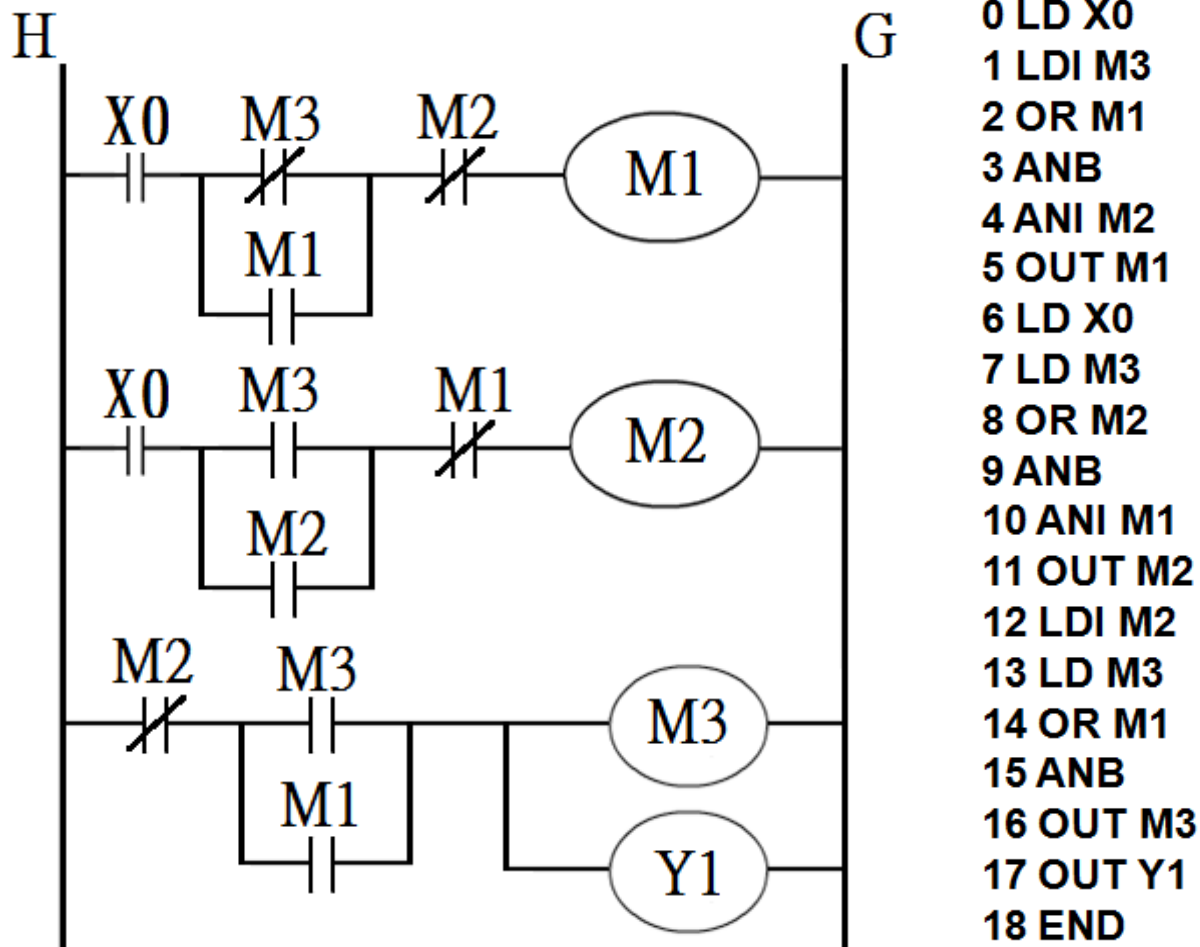
### PLC circuit



# Single button ON/OFF circuit

## Sirkuit ON / OFF tombol tunggal

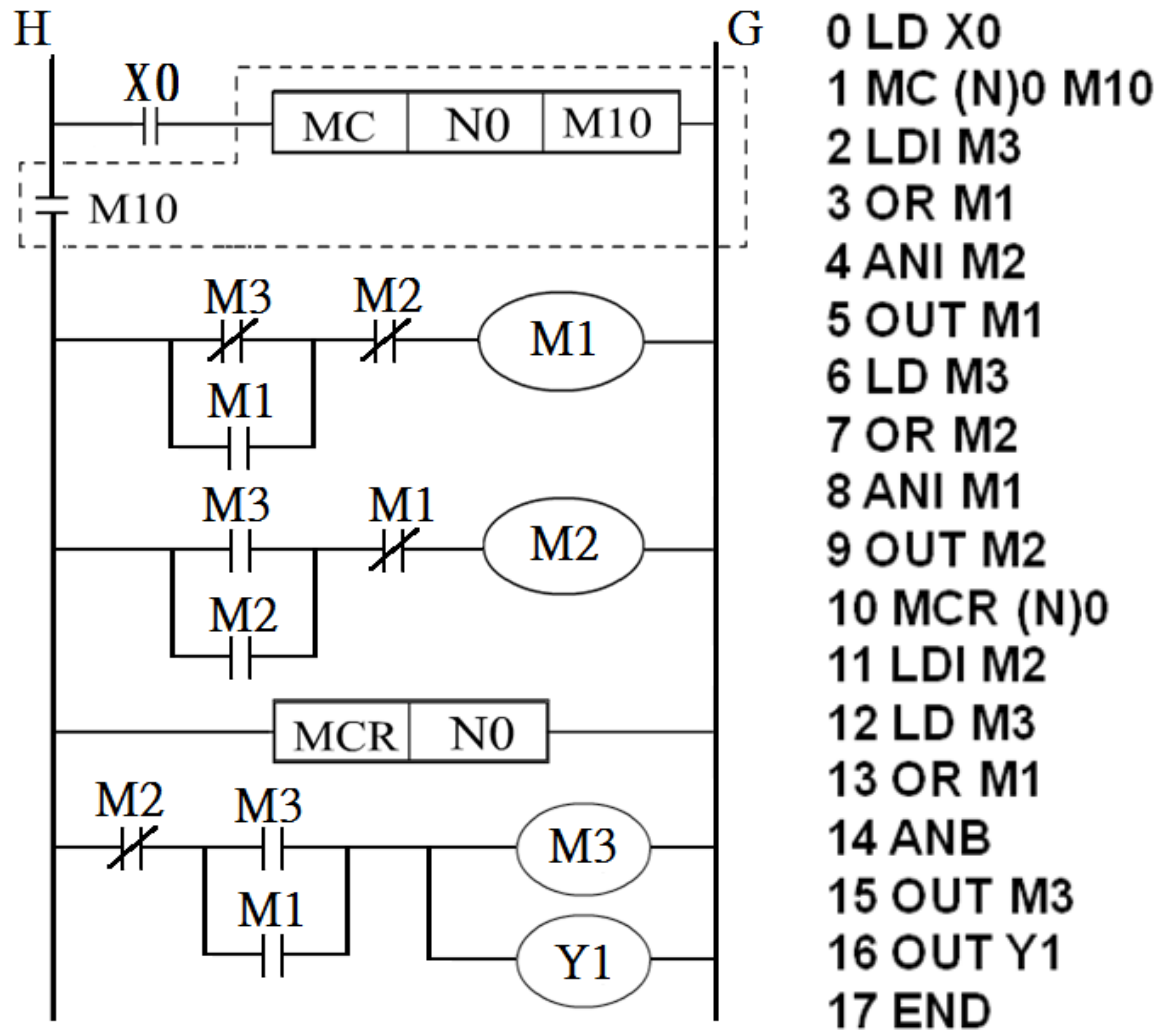
### Rewrite plan 1



# Single button ON/OFF circuit

## Sirkuit ON / OFF tombol tunggal

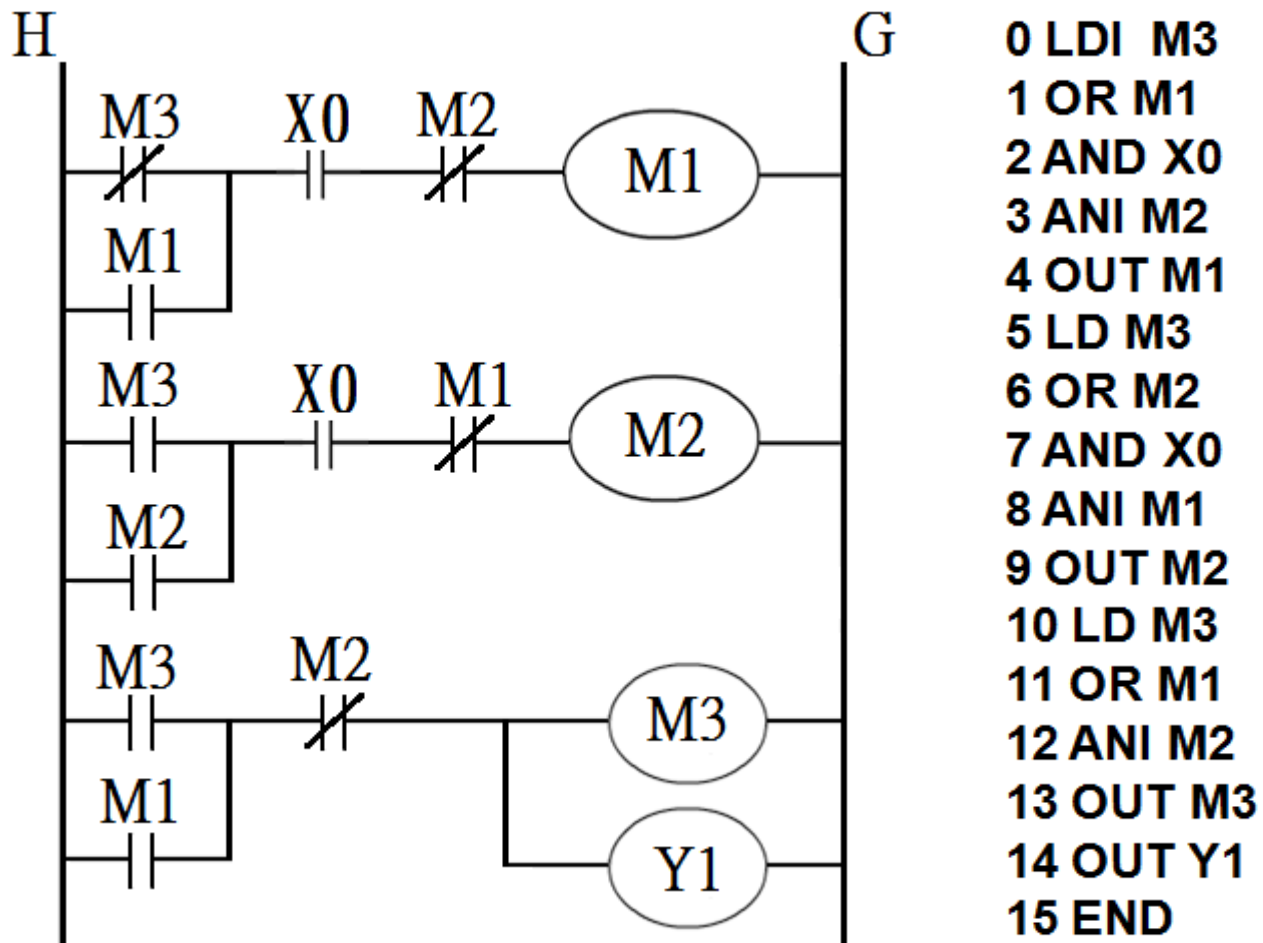
### Rewrite plan 2



# Single button ON/OFF circuit

Sirkuit ON / OFF tombol tunggal

## Rewrite plan 3





Evora, Portugal;

FIN

