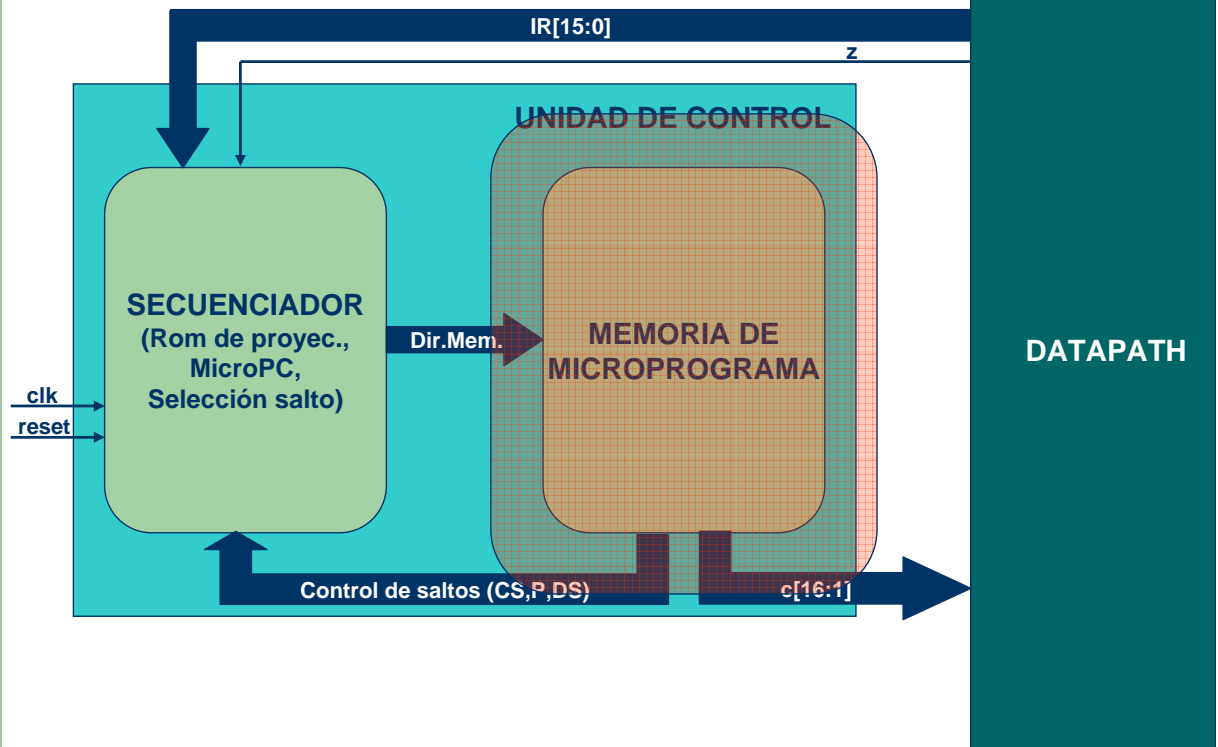


# Unidad de control microprogramada



# Memoria de microprograma

		Dir.	c1c2c3c4	c5c6c7c8	c9c10c11c12	c13c14c15c16	P	CS
Fetching	<b>c1,c3,c6</b> IR←M[PC]	0	1010	0100	0000	0000	0	00
	PC←INC(PC);Proyec.	1						
ADD rs,rf	TA←BR[rs];TB←BR[rf]	2						
	TC←TA+TB;RE←Z	3						
	BR[rs]←TC	4						
ADD rs,#cte	TA←BR[rs];TB←ExSig(cte)	5						
	TC←TA+TB;RE←Z	6						
	BR[rs]←TC	7						
ADD rs,(rf)	TA←0;TB←BR[rf]	8						
	TC←TA+TB	9						
	TA←BR[rs];TB←M[TC]	10						
	TC←TA+TB;RE←Z	11						
	BR[rs]←TC	12						
ADD rs,dir	TA←PC;TB←ExSig(de)	13						
	TC←TA+TB	14						
	TA←BR[rs];TB←M[TC]	15						
	TC←TA+TB;RE←Z	16						
	BR[rs]←TC	17						
JZ desp	→(Z=0)/(0)	18						
	TA←PC;TB←ExSig(de)	19						
	TC←TA+TB	20						
	PC←TC	21						

# Memoria de microprograma

		Dir.	c1c2c3c4	c5c6c7c8	c9c10c11c12	c13c14c15c16	P	CS
Fetching	IR ← M[PC]	0	1010	0100	0000	0000	0	00
	PC ← INC(PC); Proyec.	1	0000	1000	0000	0000	1	11
ADD rs, rf	TA ← BR[rs]; TB ← BR[rf]	2						
	TC ← TA + TB; RE ← Z	3						
	BR[rs] ← TC	4						
ADD rs, #cte	TA ← BR[rs]; TB ← ExSig(cte)	5						
	TC ← TA + TB; RE ← Z	6						
	BR[rs] ← TC	7						
ADD rs, (rf)	TA ← 0; TB ← BR[rf]	8						
	TC ← TA + TB	9						
	TA ← BR[rs]; TB ← M[TC]	10						
	TC ← TA + TB; RE ← Z	11						
	BR[rs] ← TC	12						
ADD rs, dir	TA ← PC; TB ← ExSig(de)	13						
	TC ← TA + TB	14						
	TA ← BR[rs]; TB ← M[TC]	15						
	TC ← TA + TB; RE ← Z	16						
	BR[rs] ← TC	17						
JZ desp	→ (Z=0)/(0)	18						
	TA ← PC; TB ← ExSig(de)	19						
	TC ← TA + TB	20						
	PC ← TC	21						

# Memoria de microprograma

		Dir.	c1c2c3c4	c5c6c7c8	c9c10c11c12	c13c14c15c16	P	CS
Fetching	IR ← M[PC]	0	1010	0100	0000	0000	0	00
	PC ← INC(PC); Proyec.	1	0000	1000	0000	0000	1	11
ADD rs, rf	TA ← BR[rs]; TB ← BR[rf]	2	0000	0011	0000	1000	0	00
	TC ← TA + TB; RE ← Z	3	0000	0000	1100	0000	0	00
	BR[rs] ← TC	4	0001	0000	0000	0000	0	11
ADD rs, #cte	TA ← BR[rs]; TB ← ExSig(cte)	5						
	TC ← TA + TB; RE ← Z	6						
	BR[rs] ← TC	7						
ADD rs, (rf)	TA ← 0; TB ← BR[rf]	8						
	TC ← TA + TB	9						
	TA ← BR[rs]; TB ← M[TC]	10						
	TC ← TA + TB; RE ← Z	11						
	BR[rs] ← TC	12						
ADD rs, dir	TA ← PC; TB ← ExSig(de)	13						
	TC ← TA + TB	14						
	TA ← BR[rs]; TB ← M[TC]	15						
	TC ← TA + TB; RE ← Z	16						
	BR[rs] ← TC	17						
JZ desp	→ (Z=0)/(0)	18						
	TA ← PC; TB ← ExSig(de)	19						
	TC ← TA + TB	20						
	PC ← TC	21						

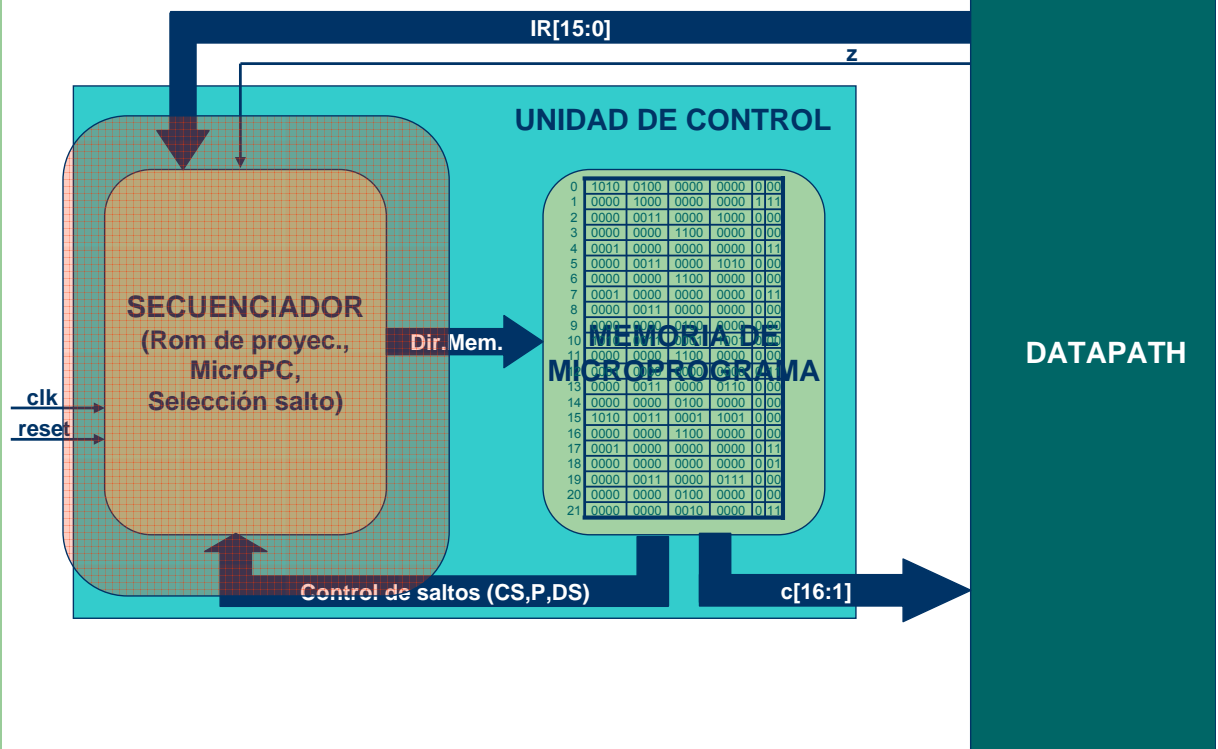
# Memoria de microprograma

		Dir.	c1c2c3c4	c5c6c7c8	c9c10c11c12	c13c14c15c16	P	CS
Fetching	IR←M[PC]	0	1010	0100	0000	0000	0	00
	PC←INC(PC);Proyec.	1	0000	1000	0000	0000	1	11
ADD rs,rf	TA←BR[rs];TB←BR[rf]	2	0000	0011	0000	1000	0	00
	TC←TA+TB;RE←Z	3	0000	0000	1100	0000	0	00
	BR[rs]←TC	4	0001	0000	0000	0000	0	11
ADD rs,#cte	TA←BR[rs];TB←ExSig(cte)	5	0000	0011	0000	1010	0	00
	TC←TA+TB;RE←Z	6	0000	0000	1100	0000	0	00
	BR[rs]←TC	7	0001	0000	0000	0000	0	11
ADD rs,(rf)	TA←0;TB←BR[rf]	8	0000	0011	0000	0000	0	00
	TC←TA+TB	9	0000	0000	0100	0000	0	00
	TA←BR[rs];TB←M[TC]	10	1010	0011	0001	1001	0	00
	TC←TA+TB;RE←Z	11	0000	0000	1100	0000	0	00
	BR[rs]←TC	12	0001	0000	0000	0000	0	11
ADD rs,dir	TA←PC;TB←ExSig(de)	13	0000	0011	0000	0110	0	00
	TC←TA+TB	14	0000	0000	0100	0000	0	00
	TA←BR[rs];TB←M[TC]	15	1010	0011	0001	1001	0	00
	TC←TA+TB;RE←Z	16	0000	0000	1100	0000	0	00
	BR[rs]←TC	17	0001	0000	0000	0000	0	11
JZ desp	→(Z=0)/(0)	18	0000	0000	0000	0000	0	01
	TA←PC;TB←ExSig(de)	19						
	TC←TA+TB	20						
	PC←TC	21						

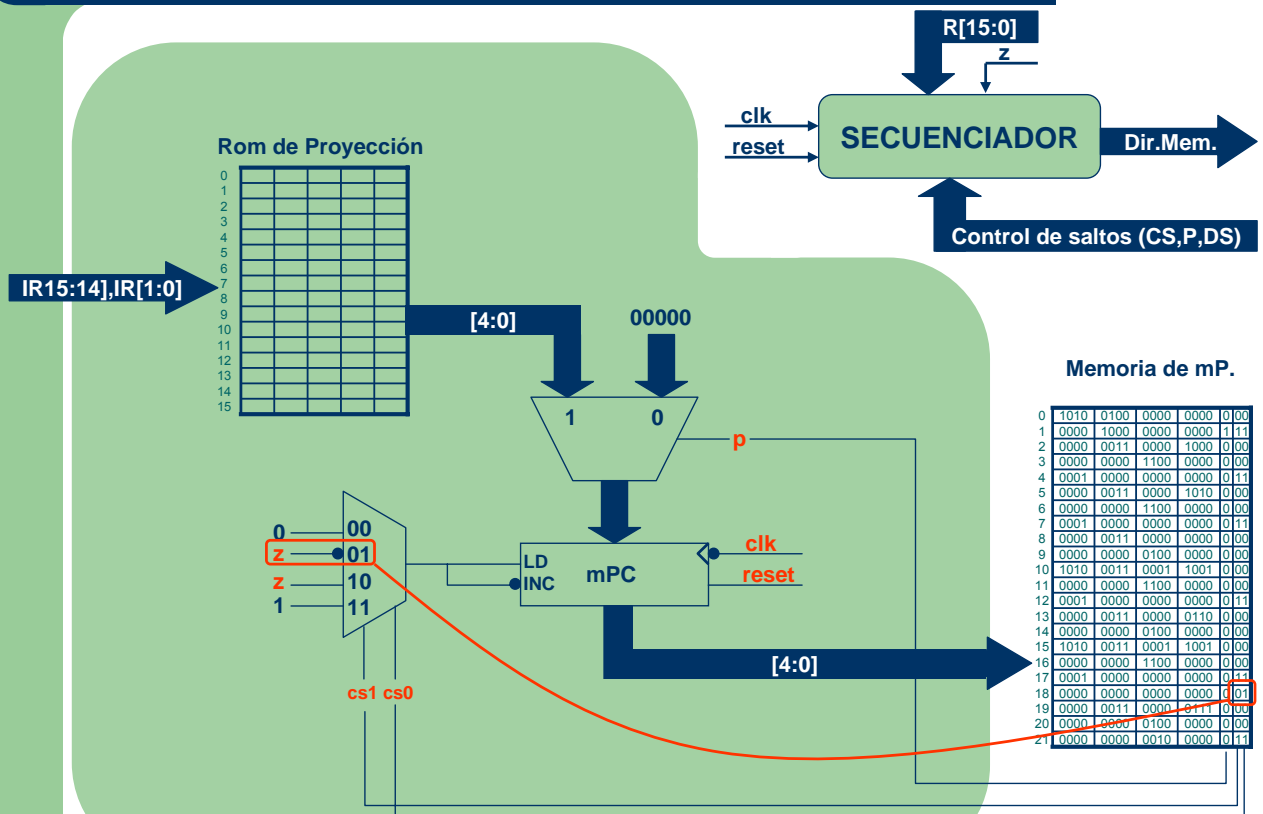
# Memoria de microprograma

		Dir.	c1c2c3c4	c5c6c7c8	c9c10c11c12	c13c14c15c16	P	CS
Fetching	IR←M[PC]	0	1010	0100	0000	0000	0	00
	PC←INC(PC);Proyec.	1	0000	1000	0000	0000	1	11
ADD rs,rf	TA←BR[rs];TB←BR[rf]	2	0000	0011	0000	1000	0	00
	TC←TA+TB;RE←Z	3	0000	0000	1100	0000	0	00
	BR[rs]←TC	4	0001	0000	0000	0000	0	11
ADD rs,#cte	TA←BR[rs];TB←ExSig(cte)	5	0000	0011	0000	1010	0	00
	TC←TA+TB;RE←Z	6	0000	0000	1100	0000	0	00
	BR[rs]←TC	7	0001	0000	0000	0000	0	11
ADD rs,(rf)	TA←0;TB←BR[rf]	8	0000	0011	0000	0000	0	00
	TC←TA+TB	9	0000	0000	0100	0000	0	00
	TA←BR[rs];TB←M[TC]	10	1010	0011	0001	1001	0	00
	TC←TA+TB;RE←Z	11	0000	0000	1100	0000	0	00
	BR[rs]←TC	12	0001	0000	0000	0000	0	11
ADD rs,dir	TA←PC;TB←ExSig(de)	13	0000	0011	0000	0110	0	00
	TC←TA+TB	14	0000	0000	0100	0000	0	00
	TA←BR[rs];TB←M[TC]	15	1010	0011	0001	1001	0	00
	TC←TA+TB;RE←Z	16	0000	0000	1100	0000	0	00
	BR[rs]←TC	17	0001	0000	0000	0000	0	11
JZ desp	→(Z=0)/(0)	18	0000	0000	0000	0000	0	01
	TA←PC;TB←ExSig(de)	19	0000	0011	0000	0111	0	00
	TC←TA+TB	20	0000	0000	0100	0000	0	00
	PC←TC	21	0000	0000	0010	0000	0	11

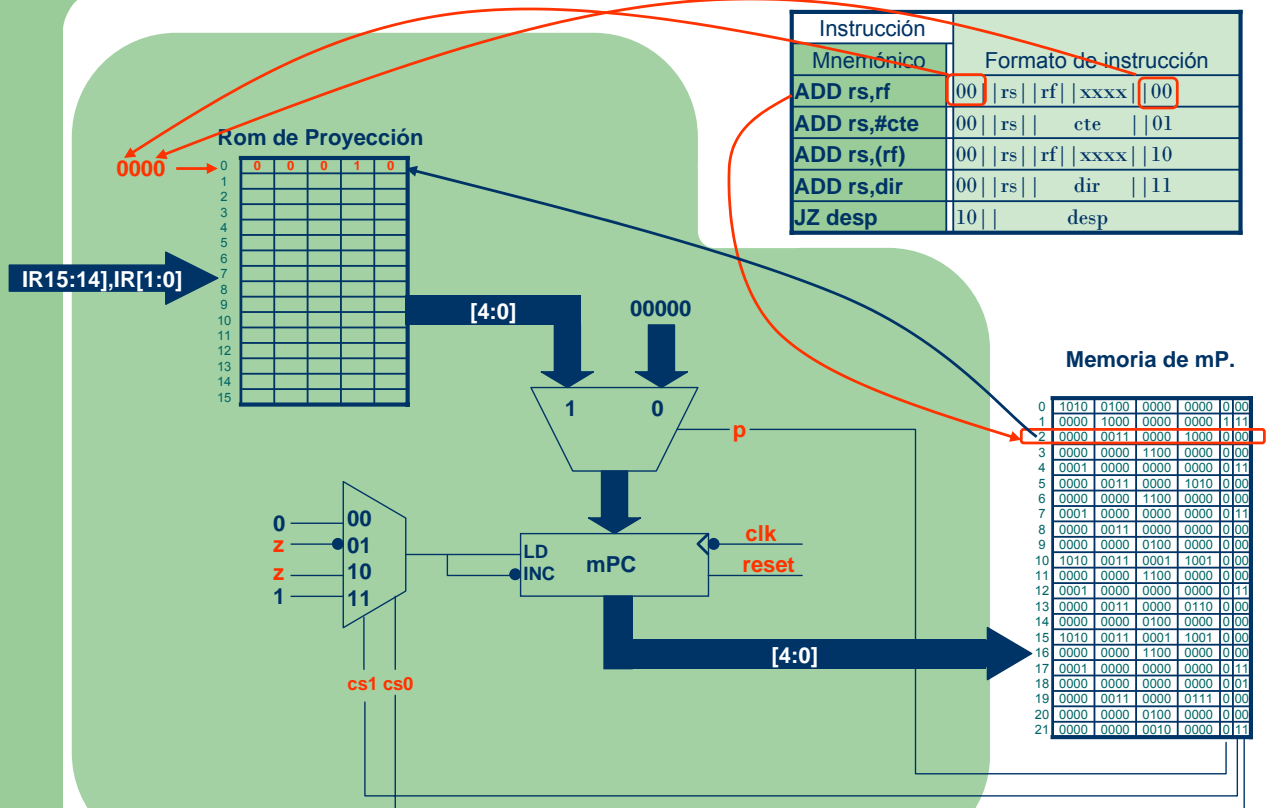
1. **Identify the problem:** The problem is that the company's sales are declining, and the marketing department is struggling to reach the target audience.



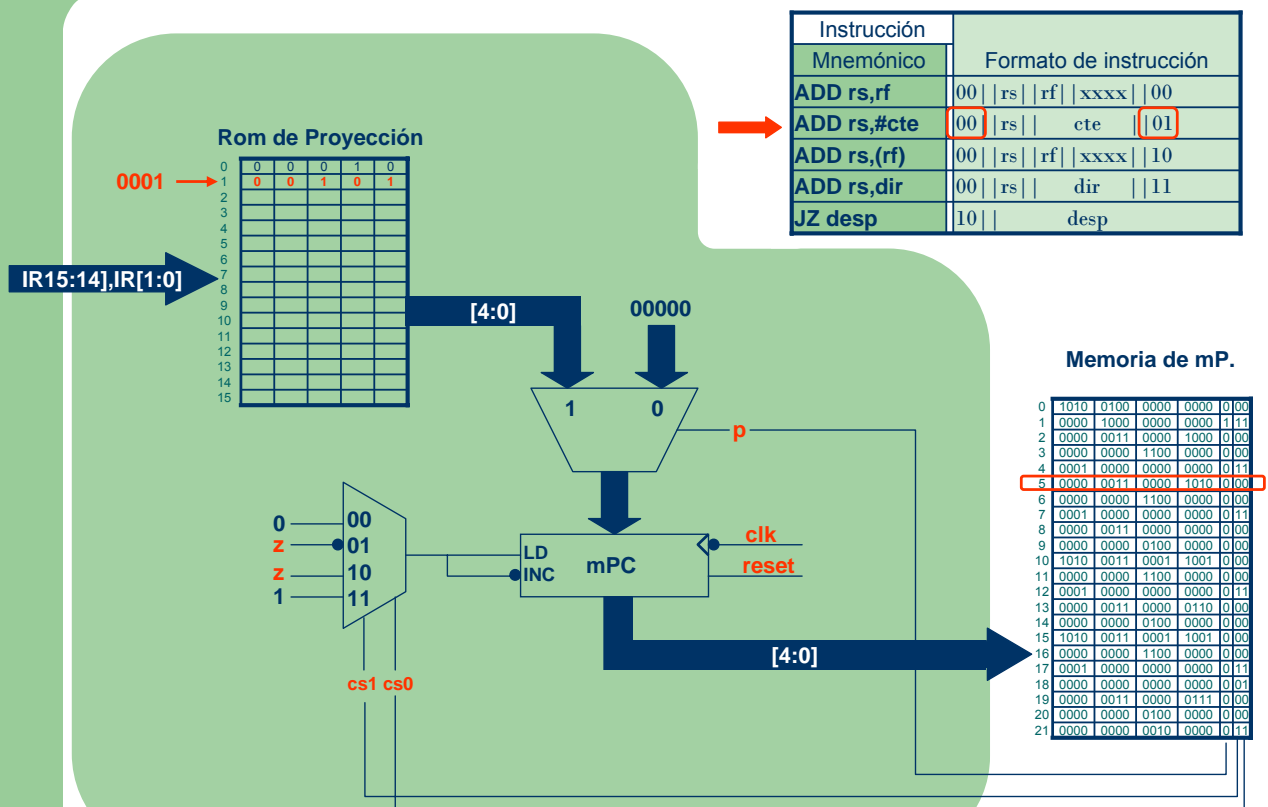
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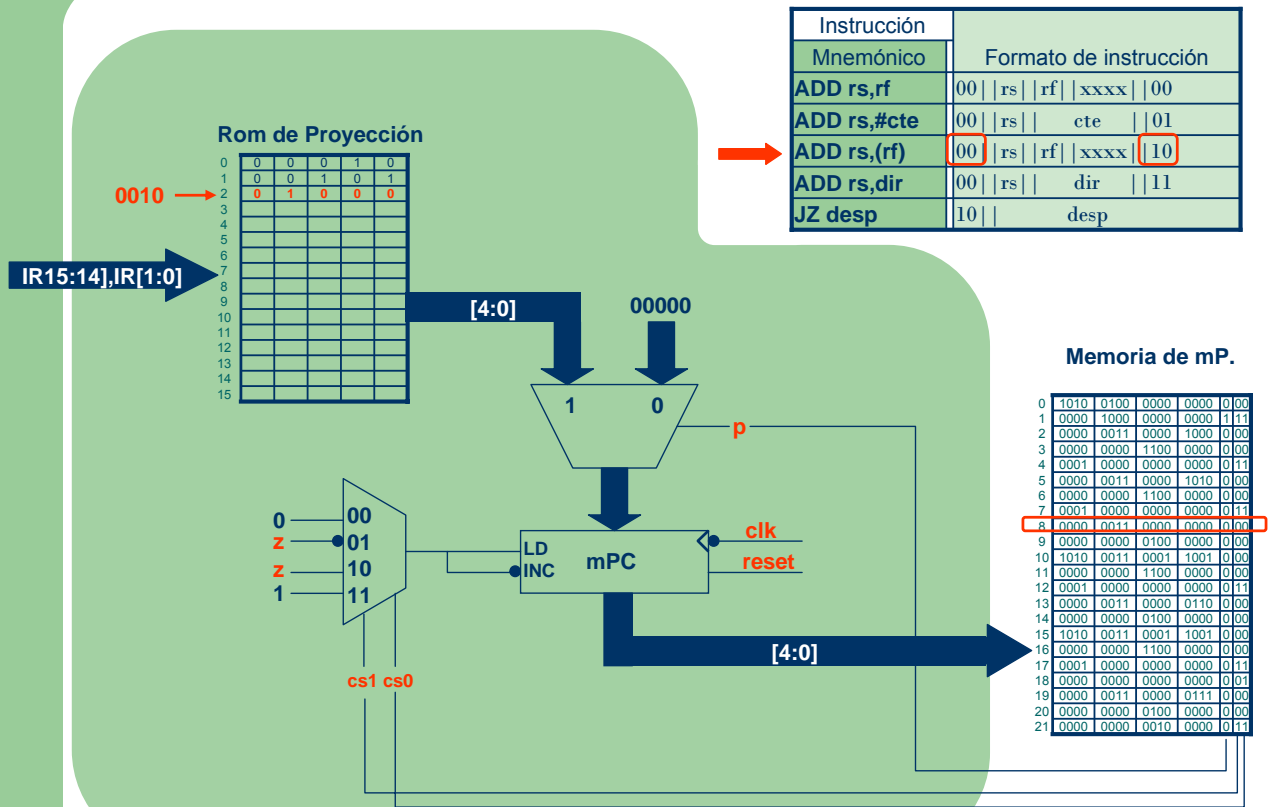
# Secuenciador: Rom de proyección



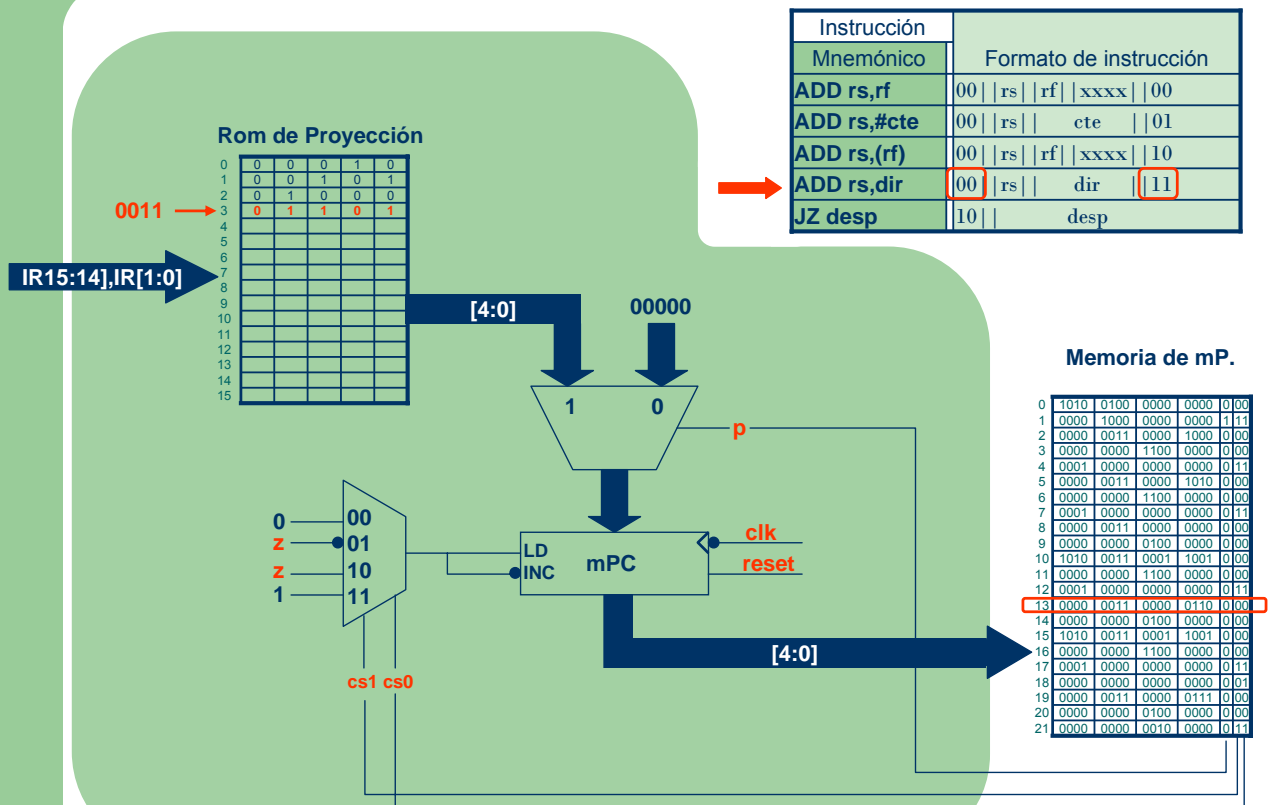
# Secuenciador: Rom de proyección



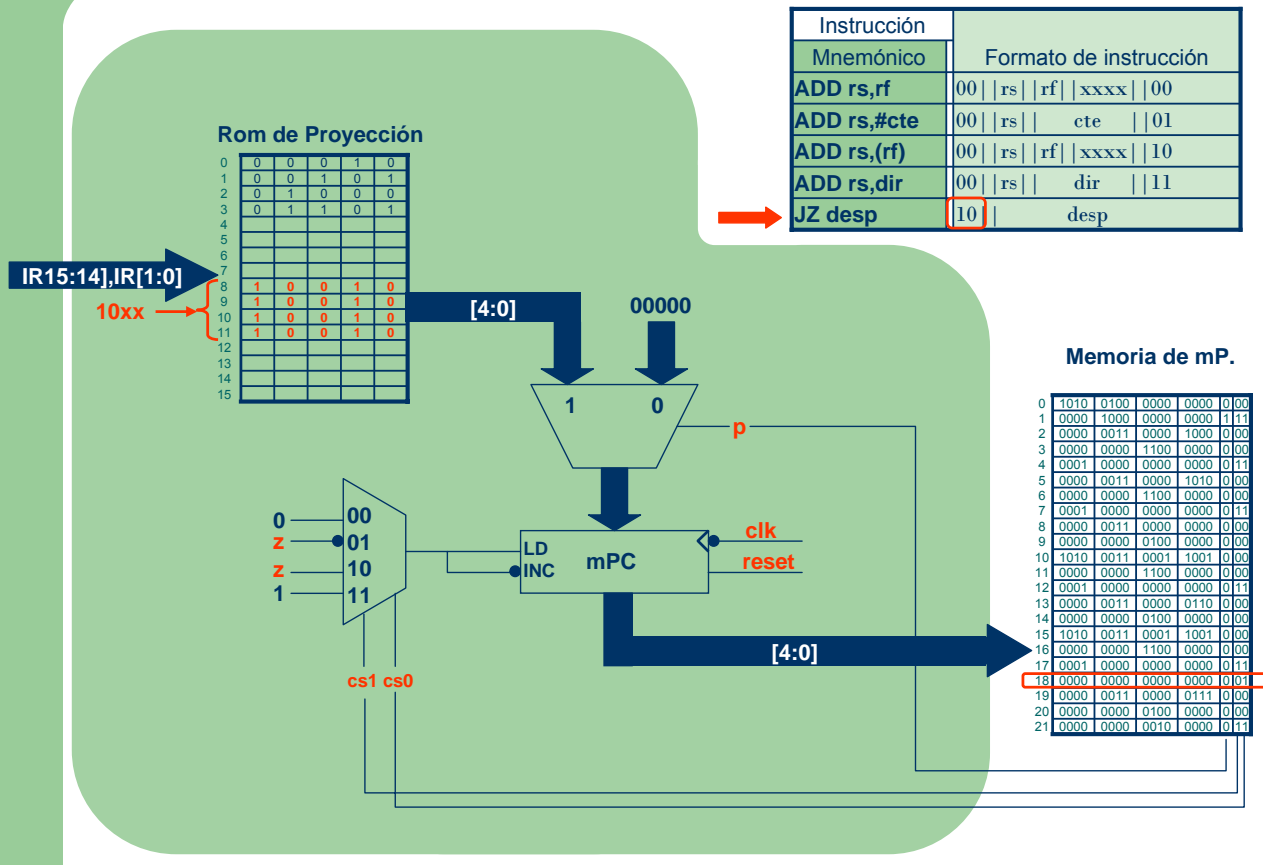
# Secuenciador: Rom de proyección



# Secuenciador: Rom de proyección



# Secuenciador: Rom de proyección



# Unidad de control microprogramada

