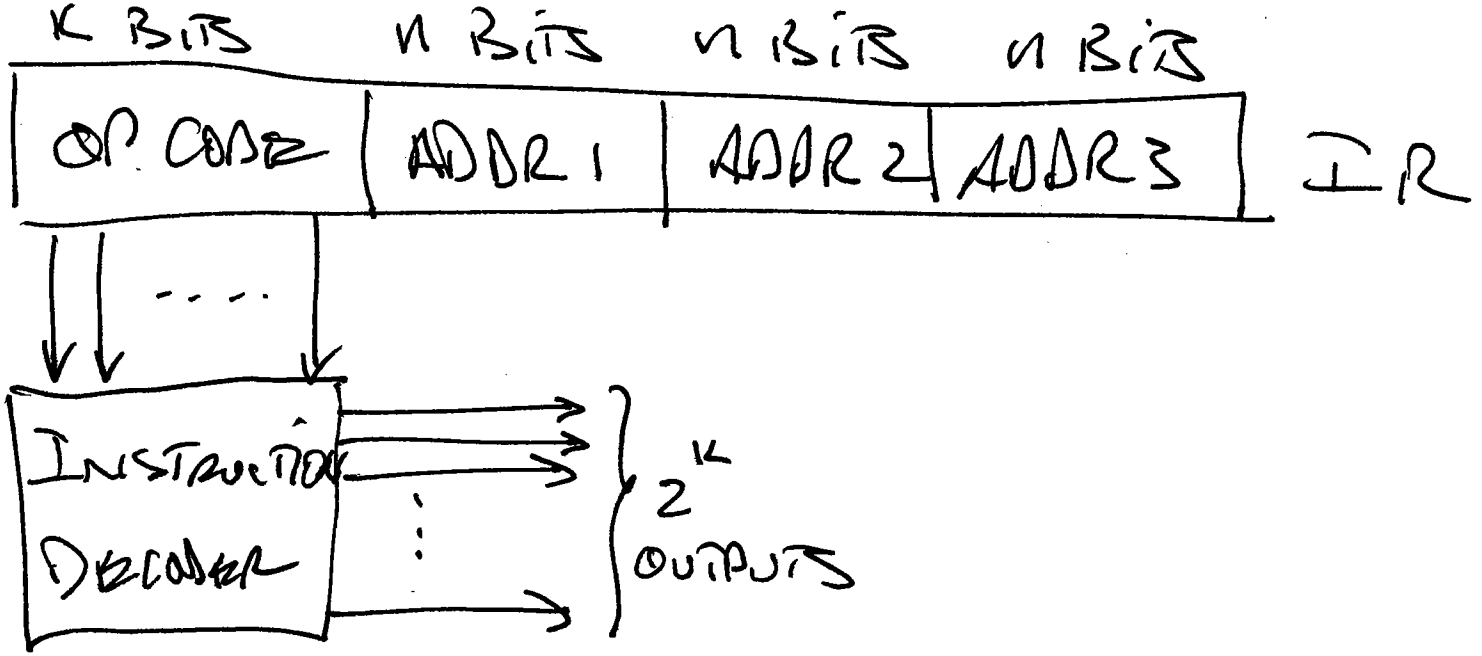
CMPS 10 3-11-08

- FINAL EXAM: WED. MAR 19, 8-11 AM (HERE)
  - BRING UCSC ID.
- LABS? (PROBABLY NOT)
- THUR MAR 13
  - QUIZ 5
  - EVALS
  - HW 4

MACHINE LANGUAGES

TOTAL



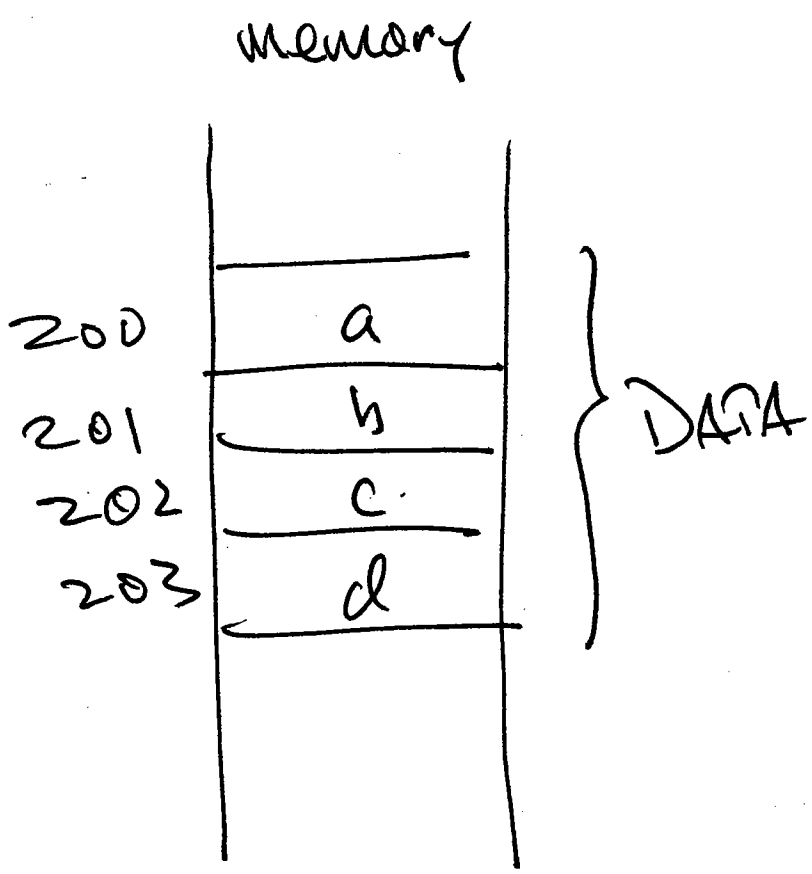
INSTR. COUNTER

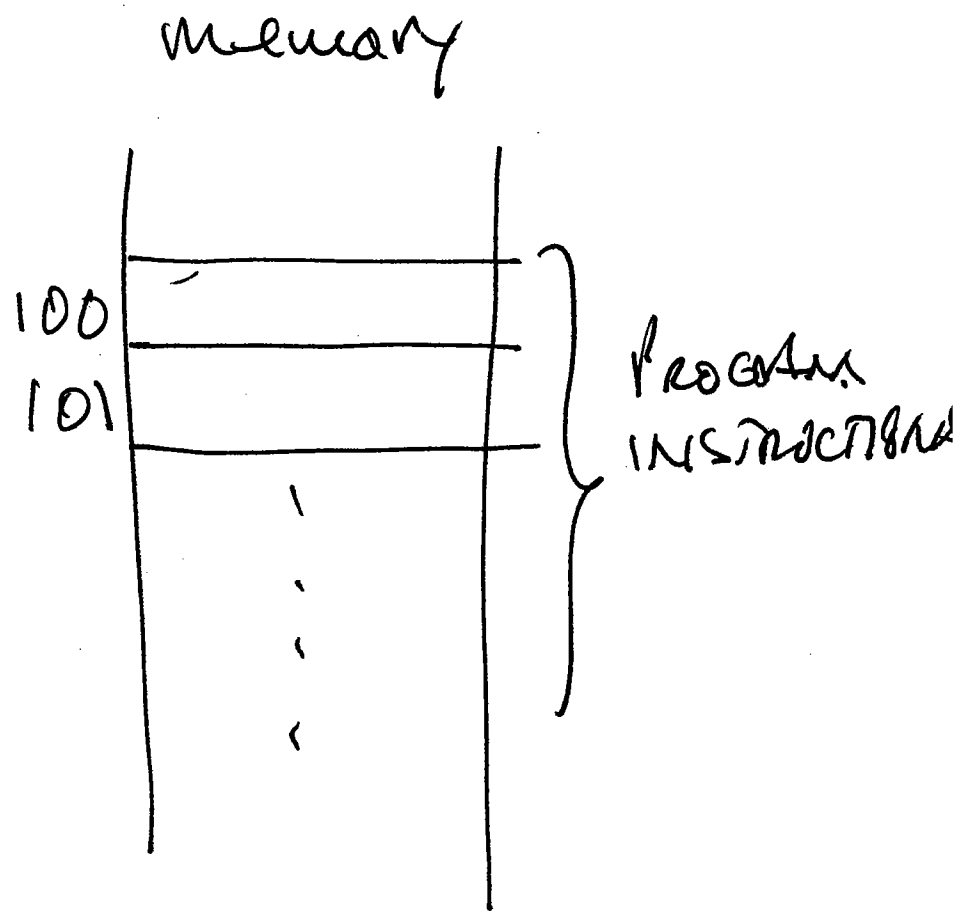
INCREMENT BY:

$\frac{3N+K}{8}$

ADDRESS AT WHICH NEXT INST. IS LOCATED.

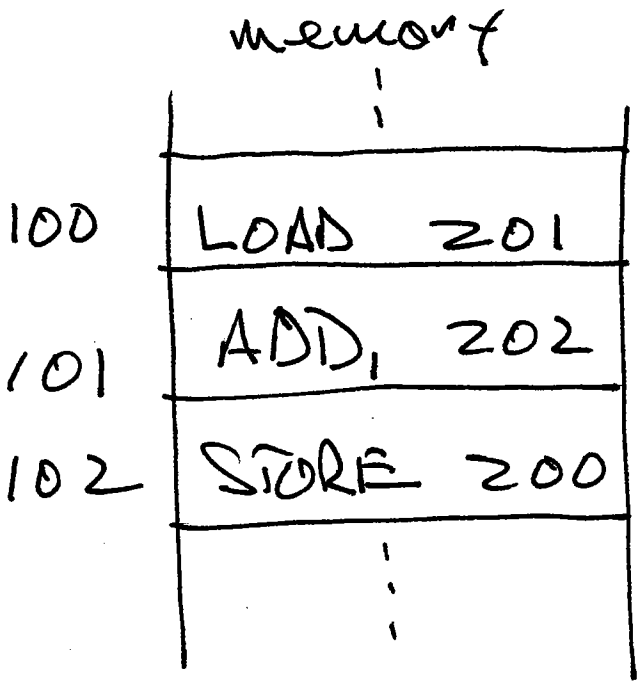
ASSUME:


memory
200
a
201
b
202
c
203
d
DATA


memory
100
101
PROGRAM
INSTRUCTIONS

Ex WRITE MACHINE LANG. INSTRUCTIONS TO

$a \leftarrow b + c$



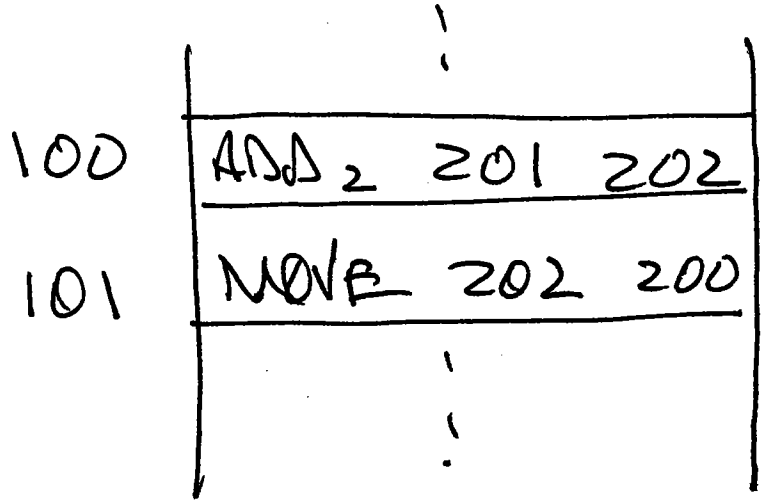
Comments

CON(R) ← CON(201)

CON(R) ← CON(R) + CON(202)

CON(200) ← CON(R)

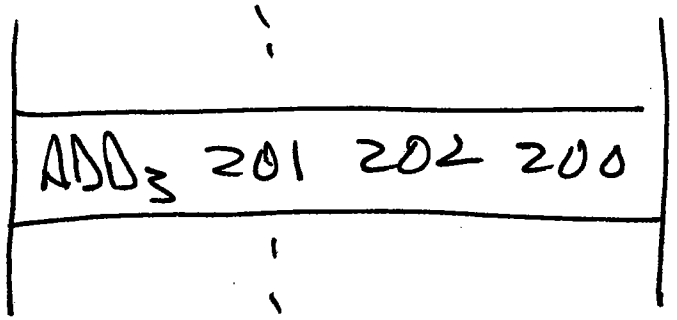
OR



CON(202) ← CON(201) + CON(202)

CON(200) ← CON(202)

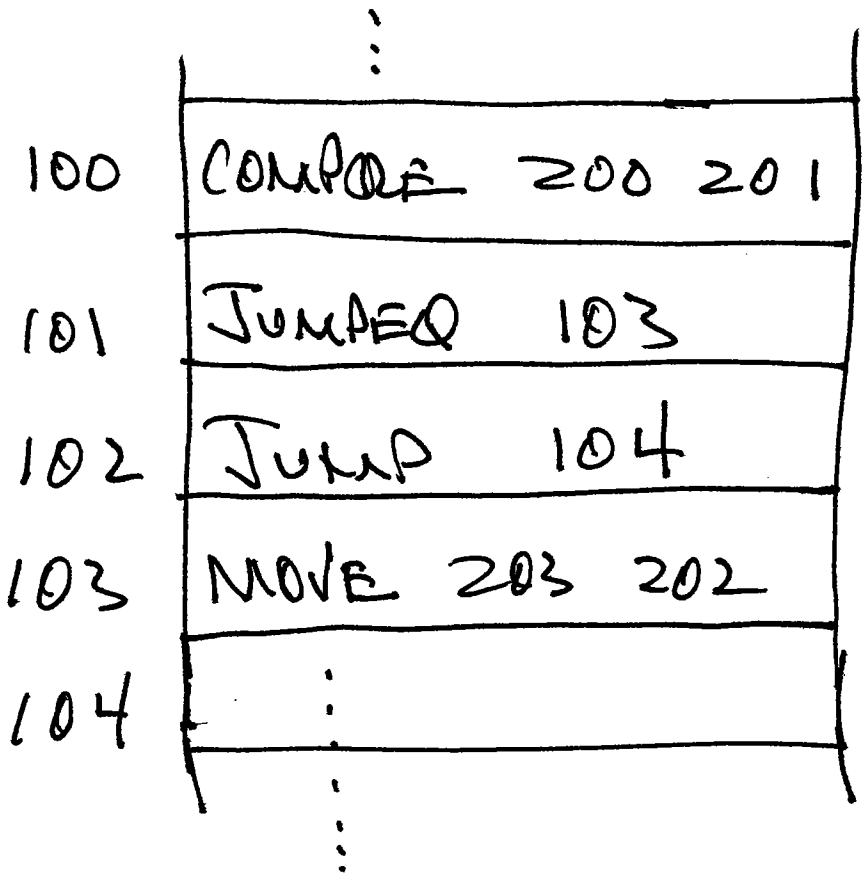
OR



CON(200) ← CON(201) + CON(202)

Ex Translate:

```
if a = b
    c ← d
```



- Comments -

SETS COND. CODES: GT, LT, EQ

JUMP IFF EQ = 1

UNCOND. JUMP

CON(202) ← CON(203

EX. TRANSLATE:

```
if a < b
    c ← d
else
    c ← 2d
```

100	COMPARE	200	201
101	JUMPLT	106	
102	LOAD	203	
103	ADD,	203	
104	STORE	202	
105	JUMP	107	
106	MOVE	203	202
107			

CON(R) ← CON(203)

CON(R) ← CON(R) + CON(203)

CON(202) ← CON(R)

CON(202) ← CON(203)

Ex. TRANSLATE:

```
while a ≤ c
    a ← a + b
```

100	COMPARE	200	202
101	JUMPGT	106	
102	LOAD	201	
103	ADD,	200	
104	STORE	200	
105	JUMP	100	
106			

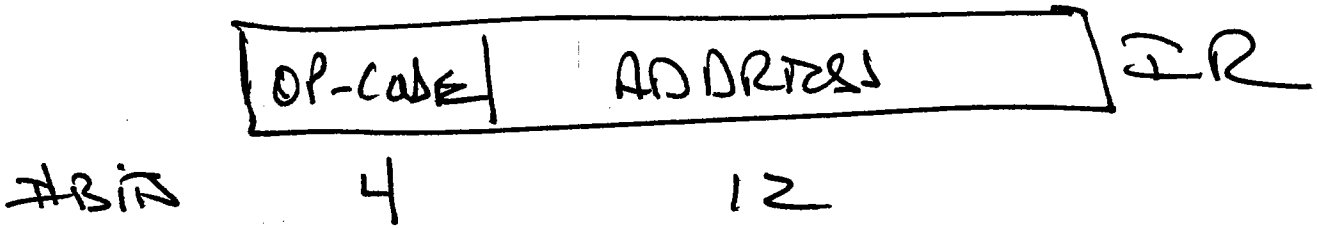
CON(R) ← CON(201)

CON(R) ← CON(R) + CON(200)

CON(200) ← CON(R)

SEC. 6.3

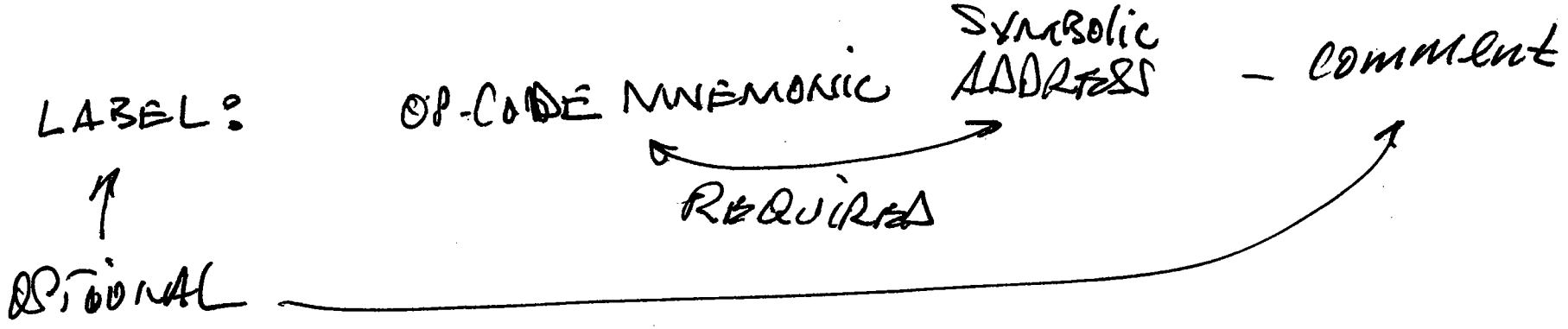
CONSIDER A HYPOTHETICAL PROCESSOR WITH



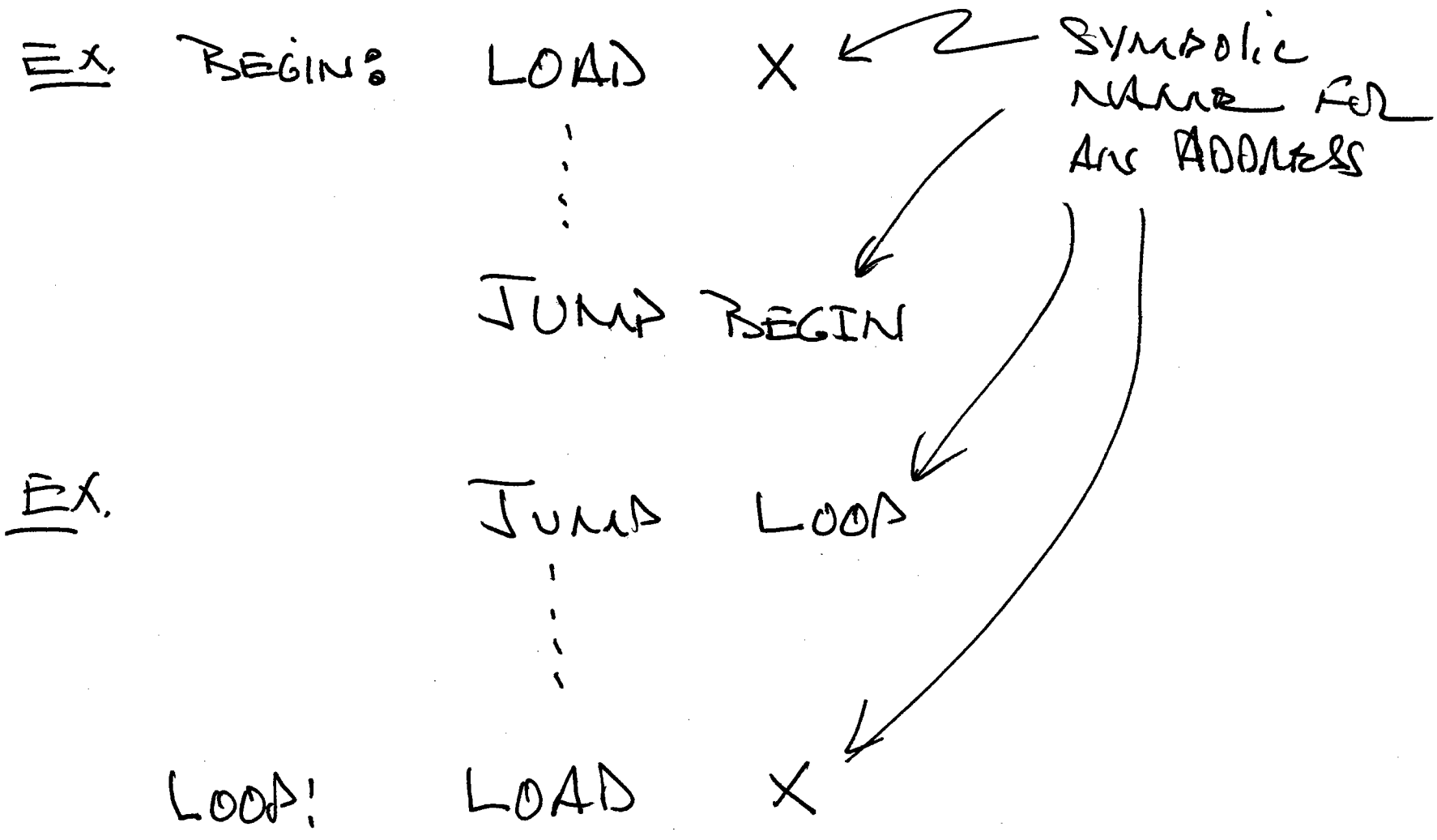
$\#OPS = 2^4 = 16$

$\#Cells = 2^{12} = 2^2 \cdot 2^{10} = 4\,KB$

ASSEMBLY LANG. FORMAT:



A LABEL is A SYMBOLIC NAME FOR A MEMORY ADDRESS



PSEUDO-OPS: INSTRUCTIONS TO THE TRANSLATOR (i.e. ASSEMBLER).

DATA GENERATION -

E.g. X: .DATA -6

TELLS THE ASSEMBLER TO CONVERT -6 TO ITS SIGN/MAGNITUDE REPRESENTATION AND STORE THOSE BITS IN A CELL(S) WITH SYMBOLIC NAME X.

ALSO .BEGIN & .END TELL
WHERE TO START & STOP TRANSLATION.

EX.

```
        .BEGIN.
TOP:    LOAD    A
        STORE   B
          :
        JUMP    TOP
          :
        HALT
A:      .DATA   5
B:      .DATA   -4
        .END
```