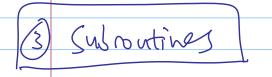
Swowt	ines and loops in arrendly
Note Title	
Porisi	on! heterotous so for:
	opcode mvemonic
	1 (000) ×
	2 Strex
	3 Add X
	4 Sust X
	5 lypet
	6 Output
	7 Halt (Slupand 000 - slup if Acco
	8 Slupand = Slupand a00 -slup & AC=0
	9 June X (skipant 800 - skip if AC>0
Porsilo	: if-else statements:
	eg." if x>2 Hen Y=3 else Y=4" becomes
	beaver
	load X
	sust two
	slaipand 800 /slaip if X72
	jump else
	if, load three
	in constitution
	else, land four
	else, land four evolit, store Y
	,

Today's topics: () while loops
(2) some ven instructions
3) subcontines
 While loops (or equivalently for loops)
10/1/C (00/3 (01 COVIDADA ( 0) (00/12)
Those are casy using skipand.
Example: for courter = 1 to 5
Y = Y + X
end
See looplems, was for the arreadly version

fil in this whentively 1 New instructions [see toble 4.6] mremonic pseudocode m(x)=PC O Jus X PC = X+1 wed for Clear AC=0 Subputiles Add I X AC=AC+M[m[x]] - see later in this lecture Jump IX PC = M[x] Load X AC = M[M(X)] Store IX M[M(X)] = AC Show demos of JnS, Add I, Jump I, Ger See example Q. I for a more practical use of Add I



subjointine  $\equiv$  function  $\equiv$  method (assembly) (C, C+) (Java)

Basic idea: - jump somewhere else, do some useful note, then return to where you were before

- the return address is the location to return to after the subroutive has finished its work.

- in MARIT, its best to store the return address at the start of the subnutive. (Use Ins for that)

- after doing the required job, use Jump I to return to the return address

example: see subnoutine Demo-mas

## Minilab:

- (1) Step through subroutiholeno. was, make she you understand
- (2) Alter suboutine Deno, mas to achieve the result  $X = (4 \times X 1) \times 4 \times 4$
- (3) Write a subjoutive that multiplies two possible integers X and Y, storly the result in Z.
- (4) Use your answer to write an arendly program that applies the product of a list of five numbers.
- (5) (an one subjoutive call another subjourtire? Give examples or counterexamples.
- (6) Can a subnutive call itself?