Marie

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1 Introduction

The aim here is not to explain the inner workings of assembly language ,for a more thorough understanding visit : http://www.cs.uni.edu

1.1 Some Marie Instructions

- LOAD X- puts what is in X onto AC (AC value = X).
- LOADI X- put what is in memory address X onto AC (AC value =value stored in X).
- STORE X- saves value in AC in memory address X.
- STOREI X -saves value in AC in memory address value stored in X.
- INPUT- prompt input from keyboard.
- OUTPUT- show on screen what is in the AC .
- SKIPCOND 000- skip next instruction if what is the AC in negative.
- SKIPCOND 800- skip next instruction if what is in AC is positive .
- SKIPCOND 400- skip next instruction if AC=0.
- JUMP X - jump to memory address X .

For more instructions check out :
https://cs.msutexas.edu/ simpson/wordpress/wp-content/uploads/2012/12/Marie-Instruction-Set-Cheat-Sheet.pdf

2 For loop and IF function

The for loop is used in high level languages like java . Here is a simple for loop in C++:

3 image

```
for (int ctrl=0;ctrl<10;ctrl++)
{
std::cout<<1<<endl;
}
```

```
LoopStart, LOAD One
OUTPUT
LOAD ctrl
SUBT One
STORE One
SKIPCOND 000
JUMP LoopStart
LOAD One
OUTPUT
HALT

ctrl, Dec 9
One, Dec 1
```

We can use our understanding of this implementation of the ofthe for loop in marie to solve problems we know the solution of in high level languages such as the integer multiplication problem :
axb(a times b) where a and b are integes can be solved in c++ using a for loop , lets take a=20 ,b = 7

```
int a = 20
for(int b=0;b<7;b++){
a=a+20;
}
std::cout<<a<<endl;
```

```
LoopStart, LOAD a
ADD a
STORE a
LOAD b
SUBT One
STORE b
SKIPCOND 000
JUMP LoopStart
LOAD a
OUTPUT
HALT
a, Dec 20
b, Dec 7
One, Dec 1
```