



San Francisco Bay University

CE305 - Computer Organization 2023 Fall Homework #4

Due day: 11/22/2023

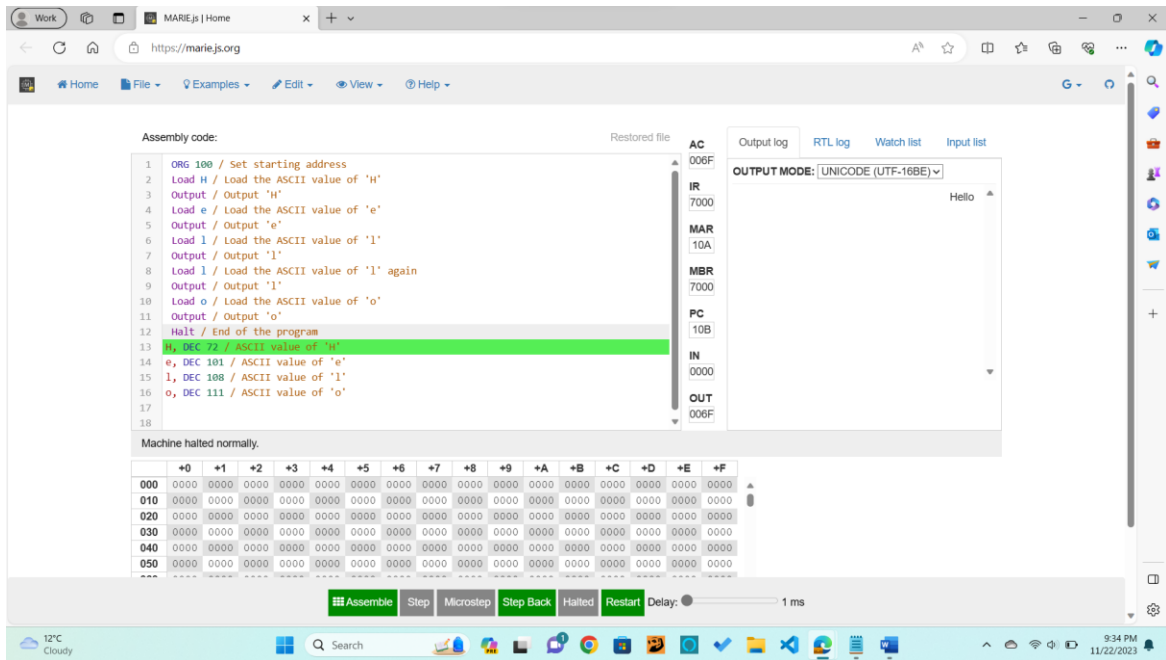
Instruction:

1. Homework answer sheet should contain the original questions and corresponding answers.
2. Answer sheet must be in PDF file format with Github links for the programming questions, but MS Word file can't be accepted. As follows is the answer sheet name format.
<course_id>_week<week_number>_StudentID_FirstName_LastName.pdf
3. The program name in Github must follow the format like
<course_id>_week<week_number>_q<question_number>_StudentID_FirstName_LastName
4. Show screenshot of all running results, including the system date/time.
5. Only accept homework submission uploaded via Canvas.
6. Overdue homework submission can't be accepted.
3. Takes academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)

1. Write the program to print the string "Hello" in MARIE assembly language.

CODE:

```
ORG 100 / Set starting address
Load H / Load the ASCII value of 'H'
Output / Output 'H'
Load e / Load the ASCII value of 'e'
Output / Output 'e'
Load l / Load the ASCII value of 'l'
Output / Output 'l'
Load l / Load the ASCII value of 'l' again
Output / Output 'l'
Load o / Load the ASCII value of 'o'
Output / Output 'o'
Halt / End of the program
H, DEC 72 / ASCII value of 'H'
e, DEC 101 / ASCII value of 'e'
l, DEC 108 / ASCII value of 'l'
o, DEC 111 / ASCII value of 'o'
```



- Write the MARIE assembly program to implement "*break*" statement in for-loop shown as follows in Python program.

```

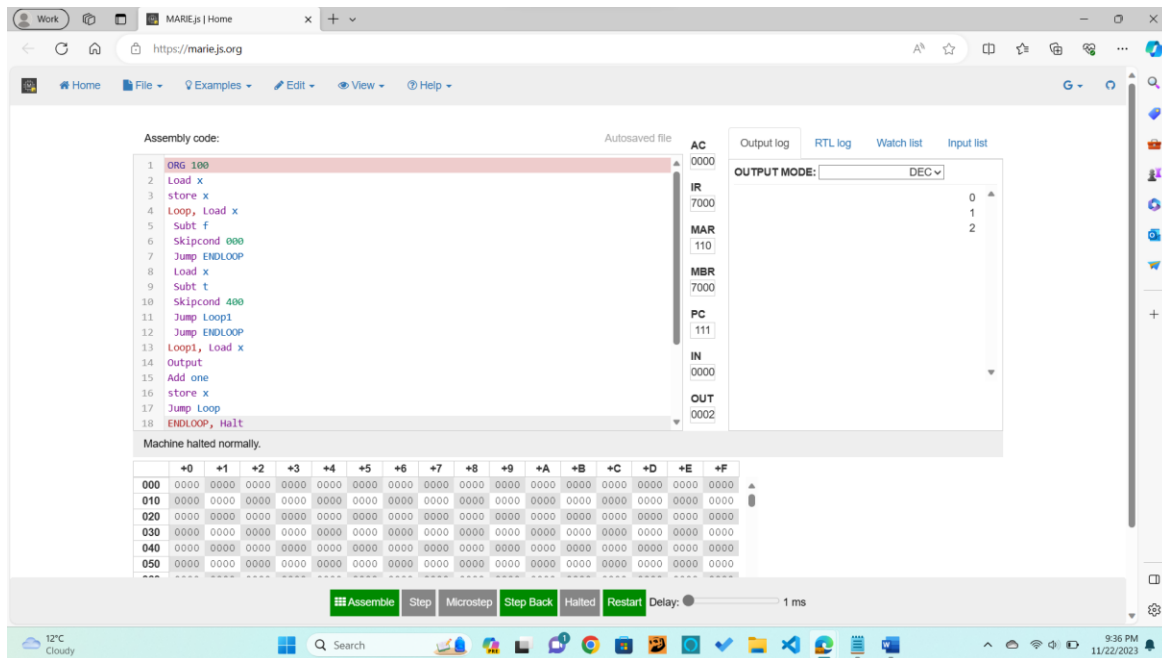
for i in range(5):
    if i == 3:
        break
    print(i)
0
1
2
ORG 100
Load x
store x
Loop, Load x
Subt f
Skipcond 000
Jump ENDLOOP
Load x
Subt t
Skipcond 400
Jump Loop1
Jump ENDLOOP
Loop1, Load x
Output
Add one
store x
Jump Loop
ENDLOOP, Halt

```

```

x, DEC 0
t, DEC 3
one, DEC 1
f, DEC 5
END 100

```



- As the question above, it is very similar but needs to implement "*continue*" statement in MARIE assembly language within the for-loop as follows in Python program.

```

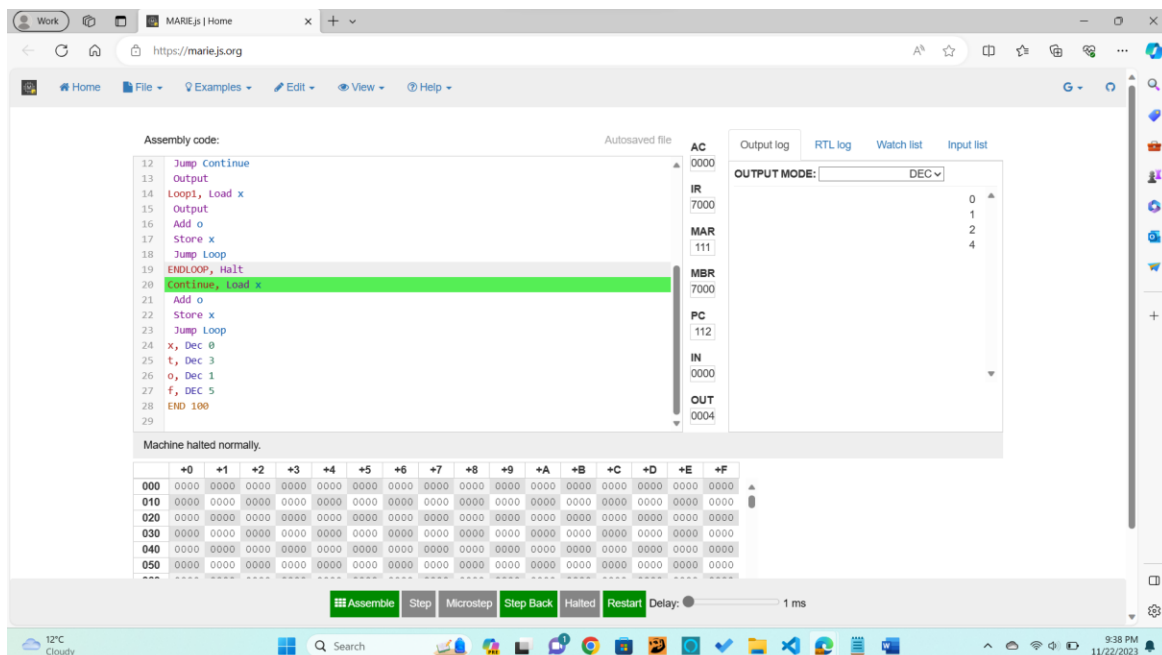
for i in range(5):
    if i == 3:
        continue
    print(i)
0
1
2
4
ORG 100
Load x
Store x
Loop, Load x
Subt f
Skipcond 000
Jump ENDLOOP
Load x
Subt t
Skipcond 400

```

```

Jump Loop1
Jump Continue
Output
Loop1, Load x
Output
Add o
Store x
Jump Loop
ENDLOOP, Halt
Continue, Load x
Add o
Store x
Jump Loop
x, Dec 0
t, Dec 3
o, Dec 1
f, DEC 5
END 100

```



4. Since there is not a multiplication instruction in ISA of MARIE, two integers multiplication operation, for instance, 4×3 , must be done by the addition operation, like $4 \times 3 = 4 + 4 + 4$. Write the MARIE assembly program to find the product of two integers $m \times n$.

ORG 100 / Start at address 100

INPUT

Store m

Input

Store n

```

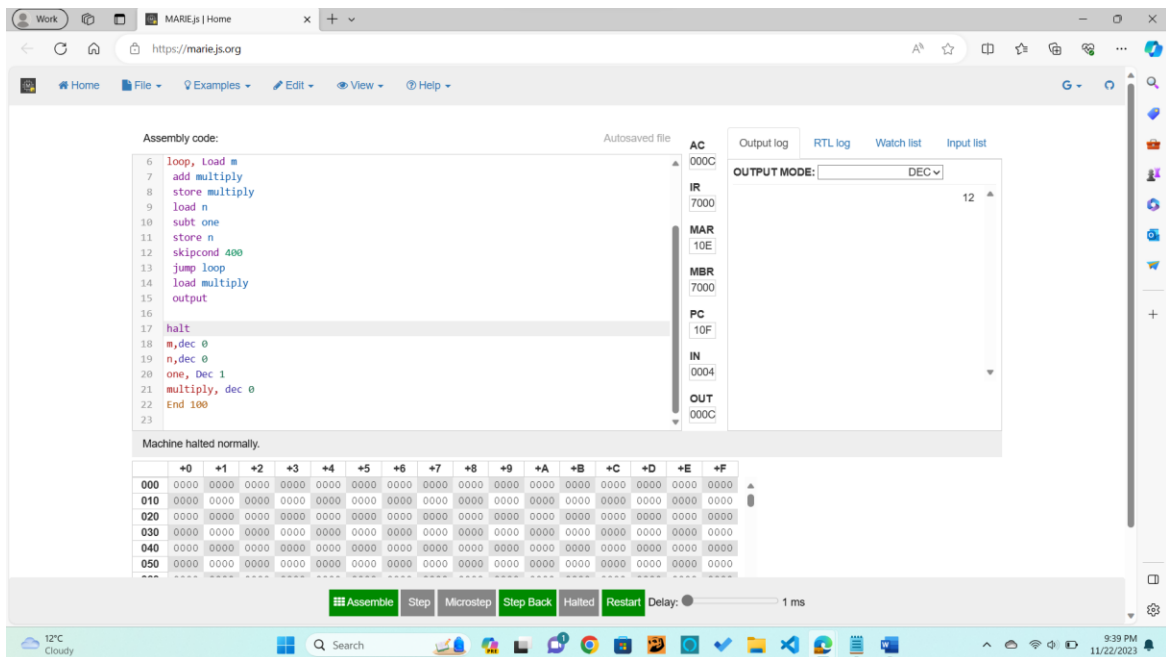
loop, Load m
add multiply
store multiply
load n
subt one
store n
skipcond 400
jump loop
load multiply
output

```

```

halt
m,dec 0
n,dec 0
one, Dec 1
multiply, dec 0
End 100
OUTPUT:
Input is 3 and 4

```



Swekchha Hamal , 19700.