# CSA Final Practical

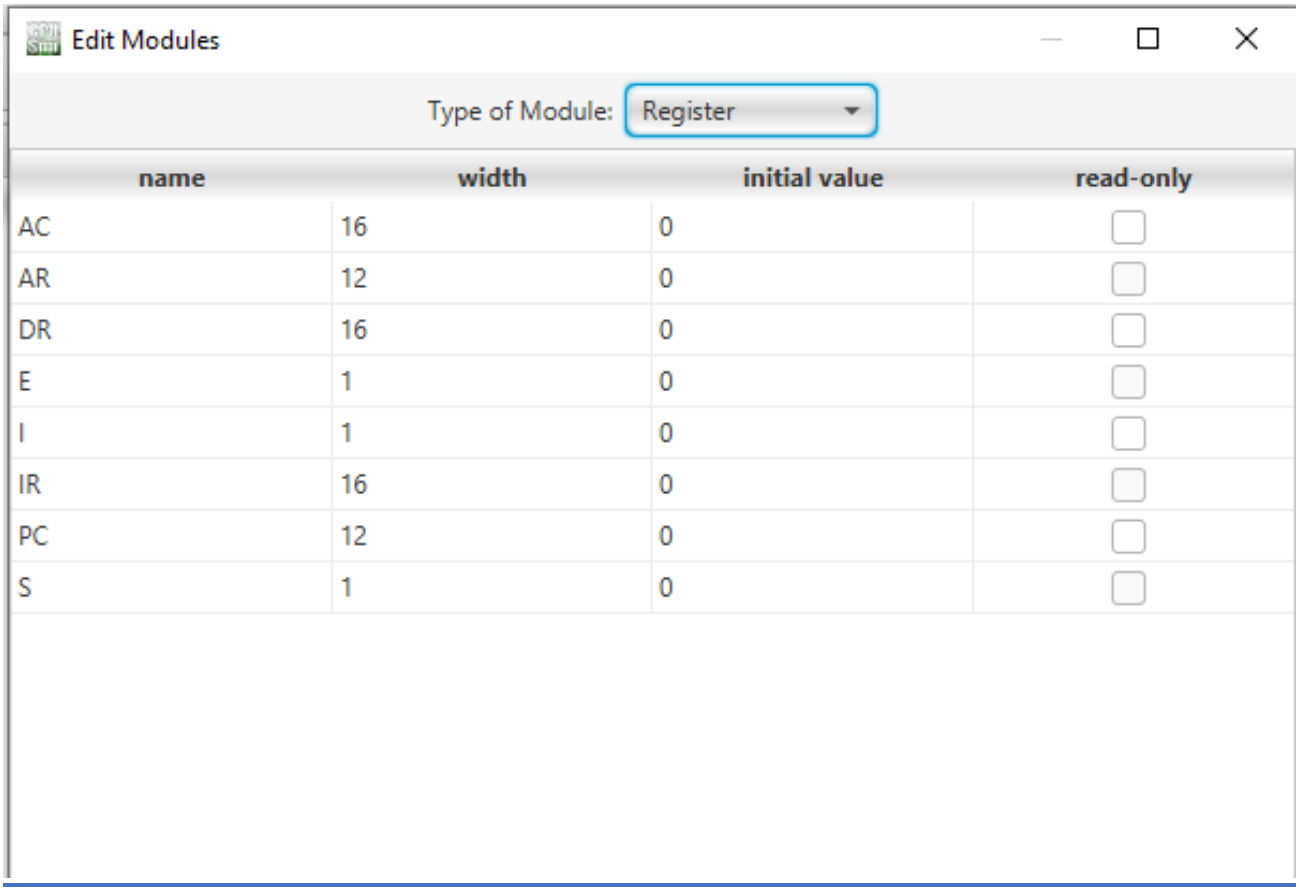
Name-> Harsh Bamotra

Roll No. -> AC-1216

# CSA Final Practical

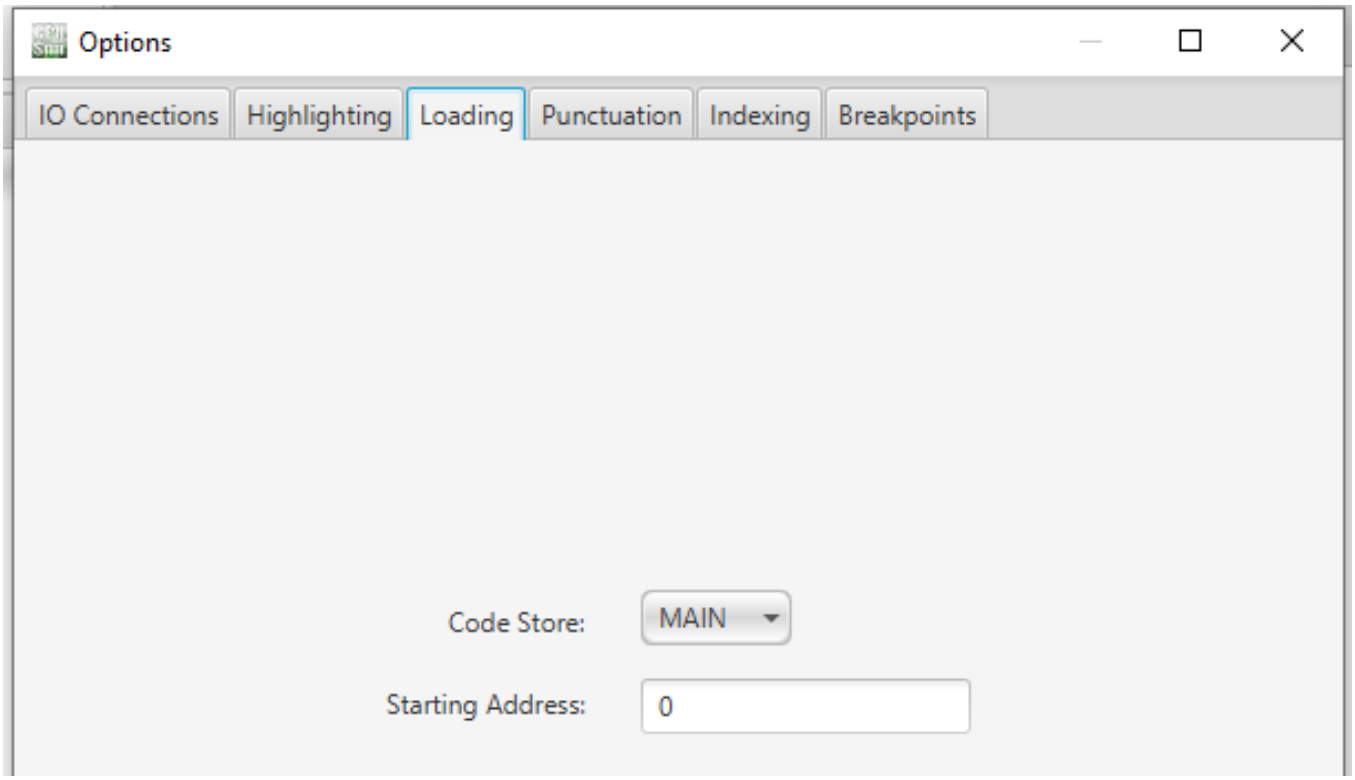
**Q1. Write an assembly language program to stimulate the machine 1 using (unused field format) for the register reference instruction and determine the contents of AC , E , PC , AR and IR register in decimal after the execution : CLA.**

## 1. Registers

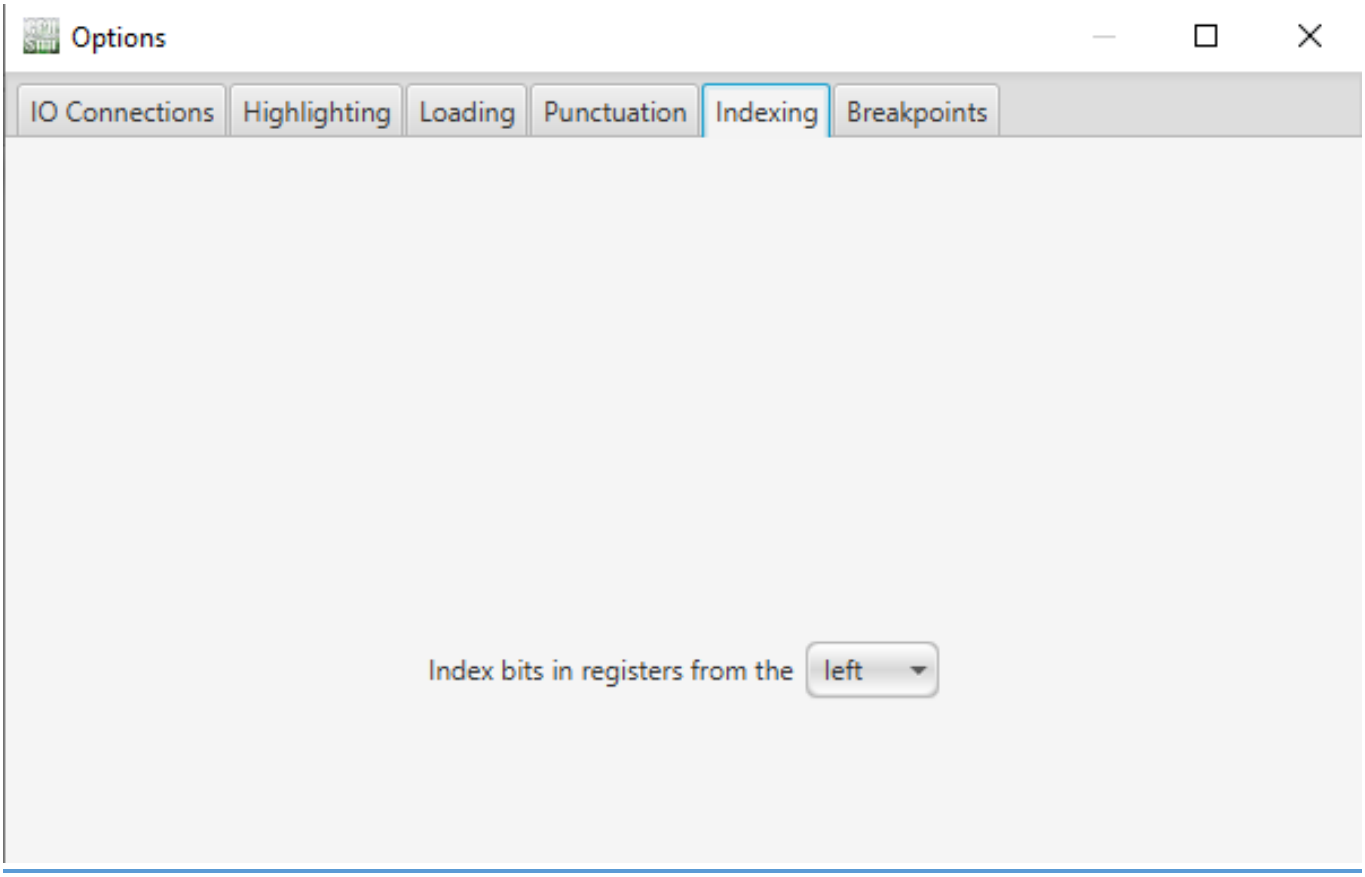



| name | width | initial value | read-only |
|---|---|---|---|
| AC | 16 | 0 | |
| AR | 12 | 0 | |
| DR | 16 | 0 | |
| E | 1 | 0 | |
| I | 1 | 0 | |
| IR | 16 | 0 | |
| PC | 12 | 0 | |
| S | 1 | 0 | |

## 2. Loading



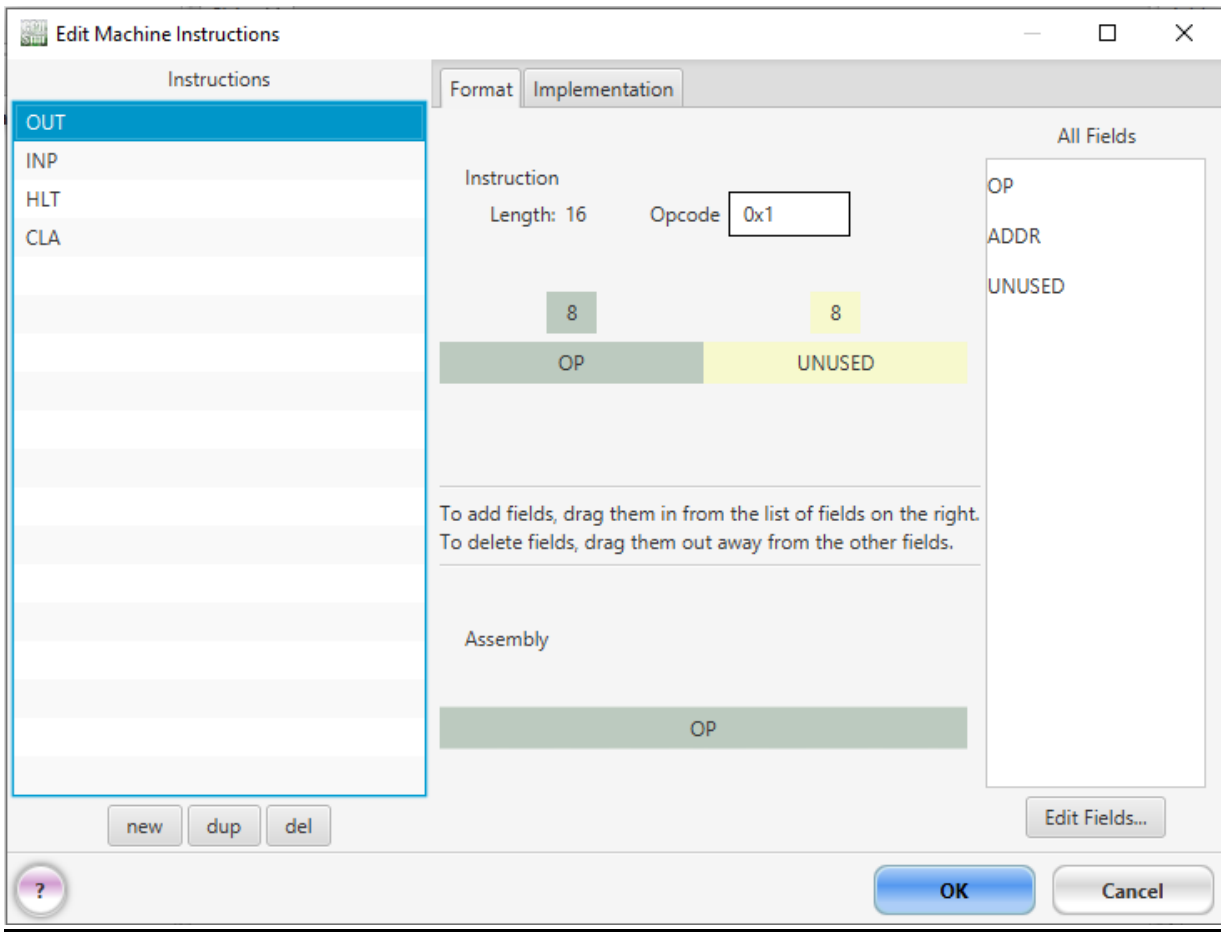

## 3. Indexing



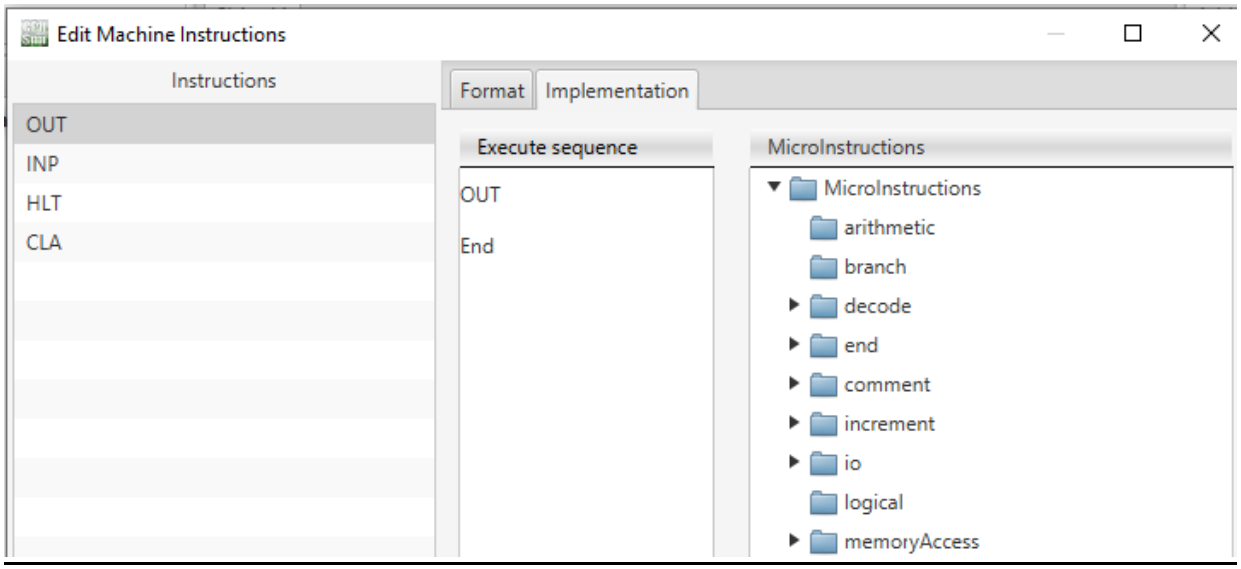
# 4. Machine Instructions

## I. Output

- **Format**

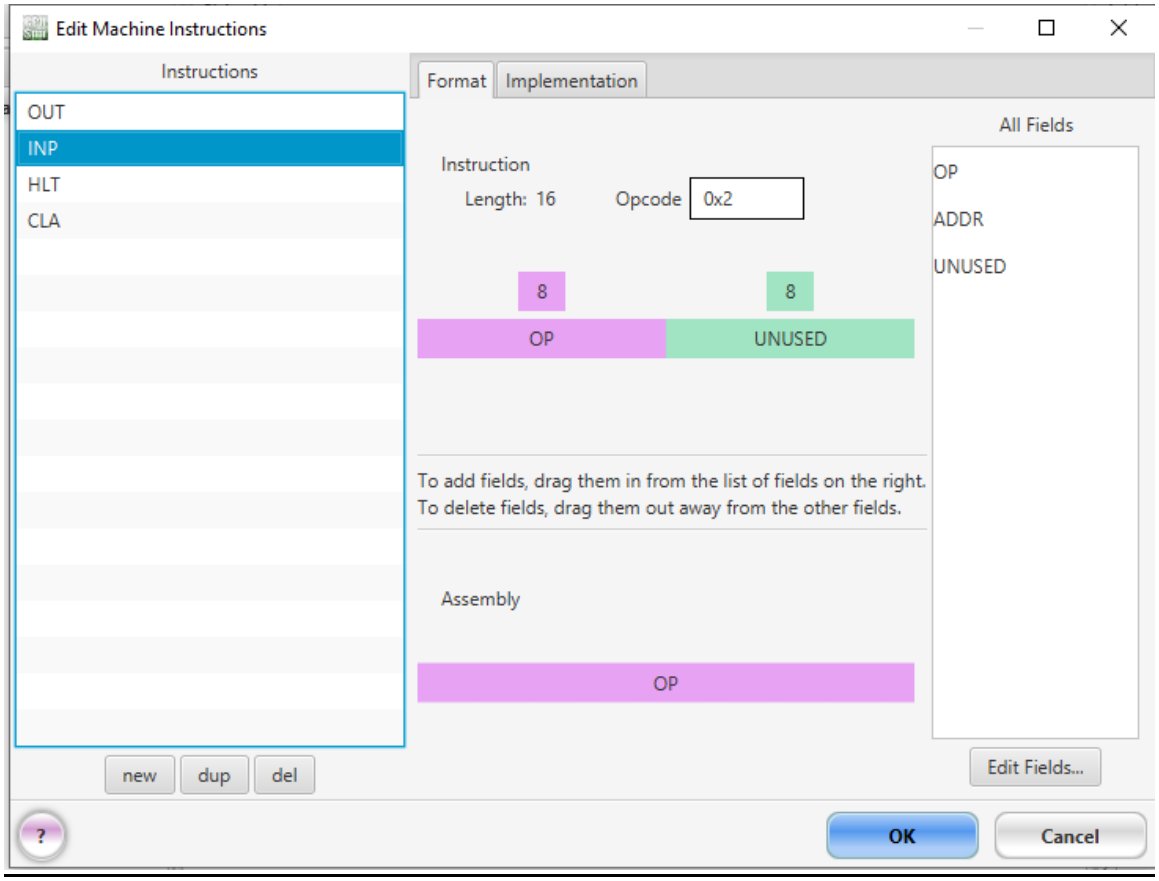



- **Implementation**

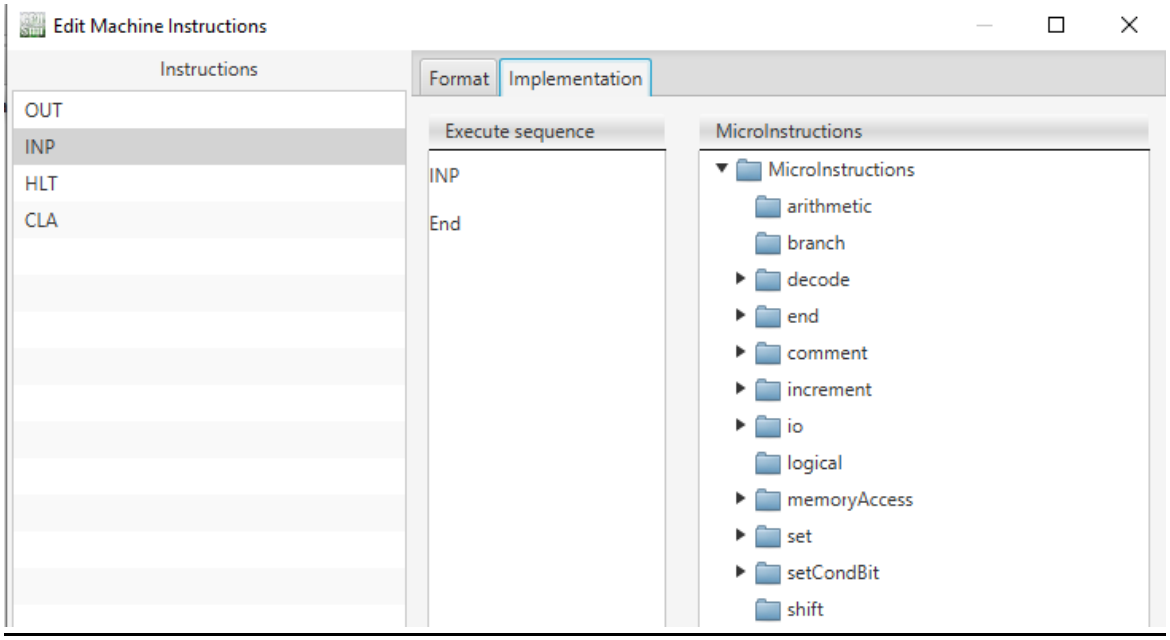


## II. Input

- **Format**

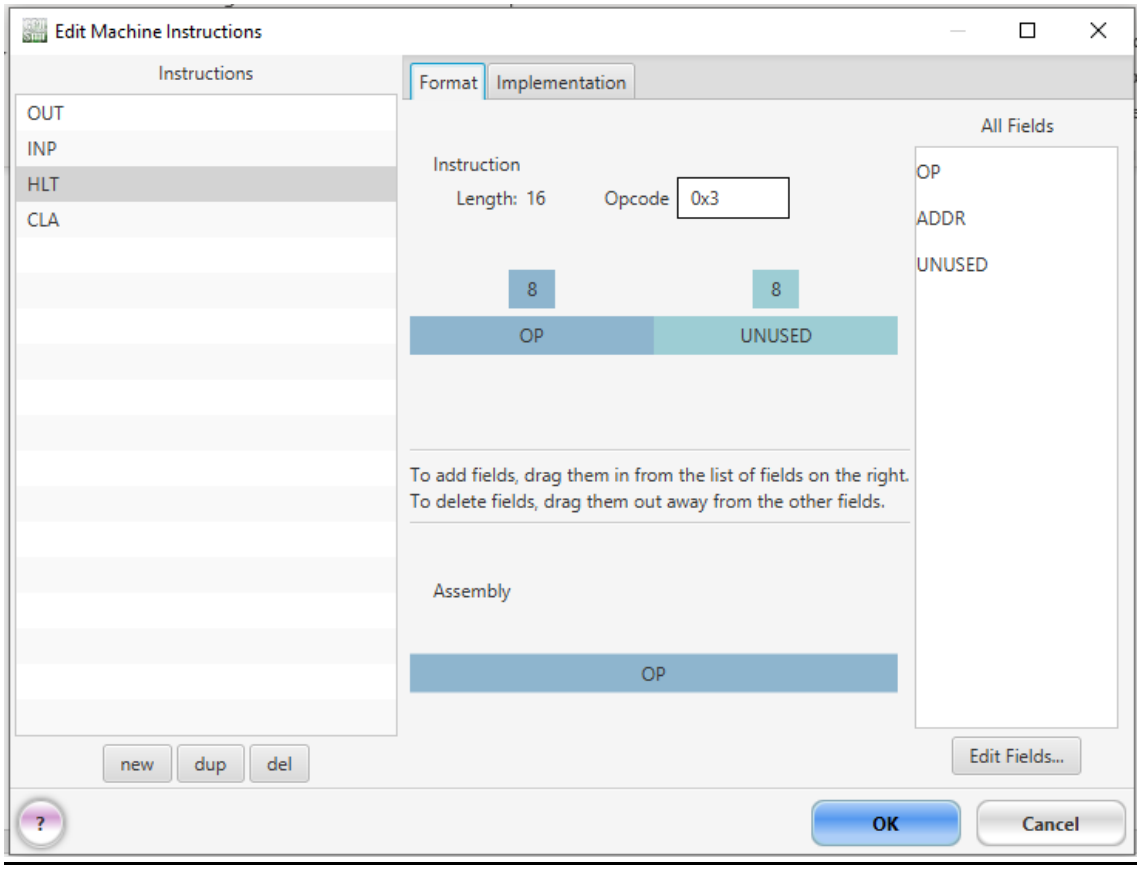



- **Implementation**

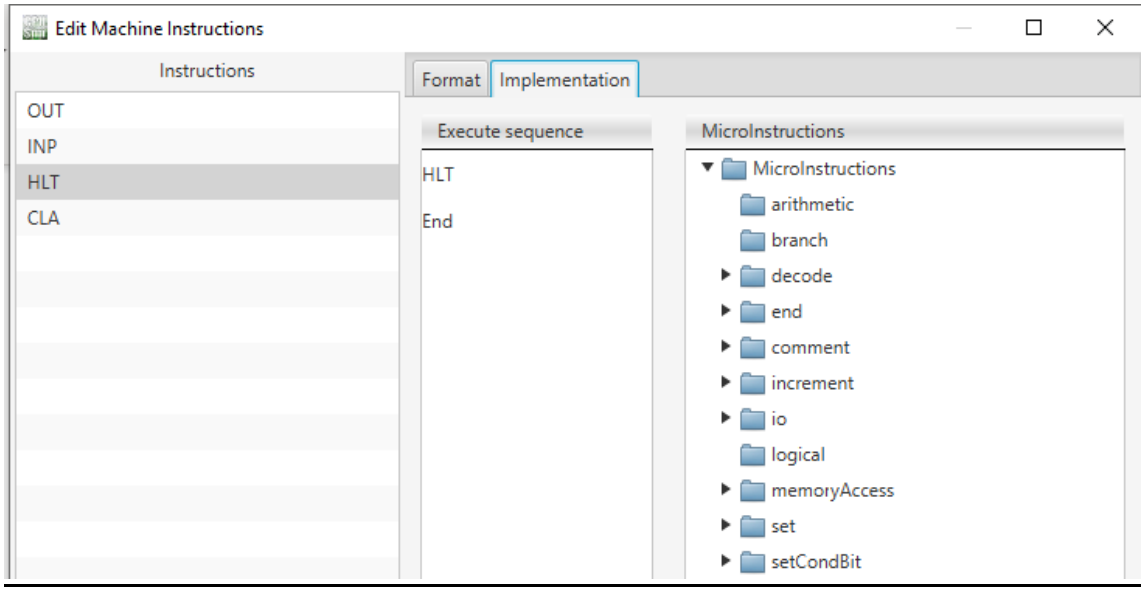


## III. HALT

- **Format**

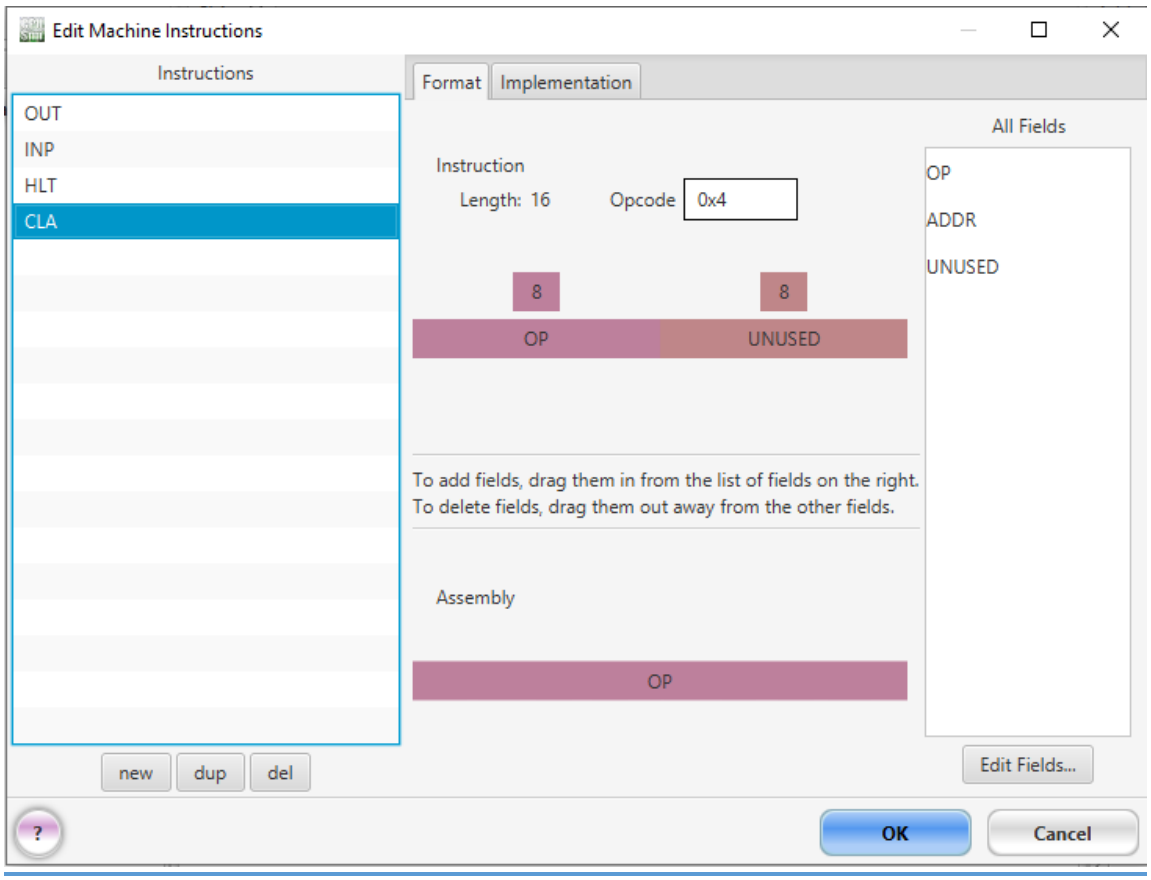



- **Implementation**

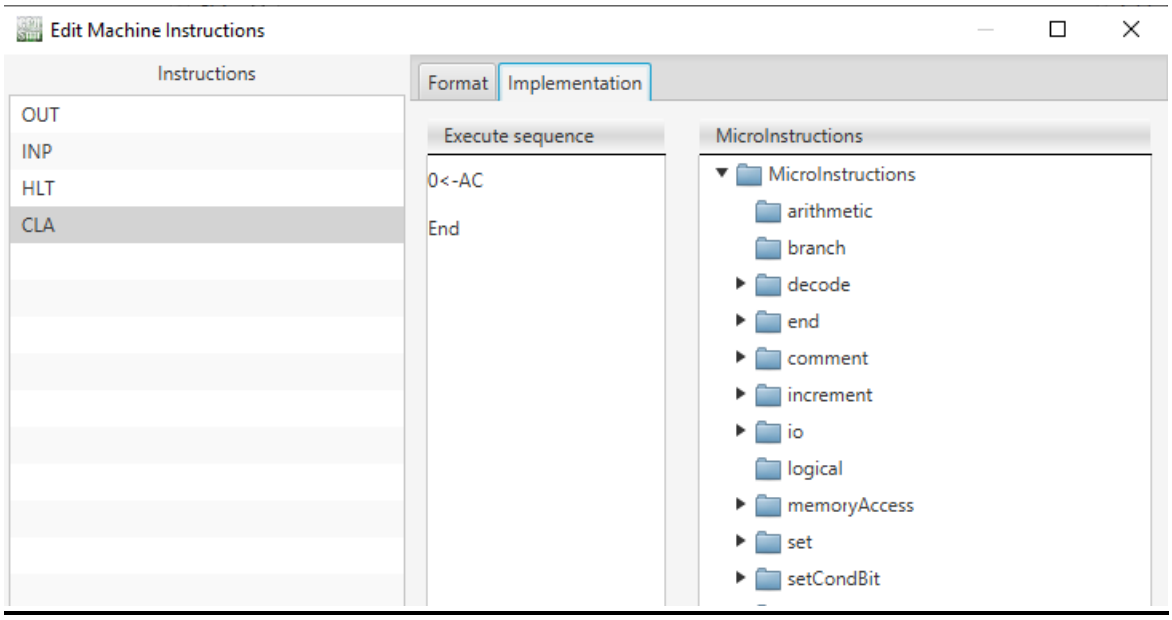


# IV. CLA

- **Format**




- **Implementation**



## 5. Text file

AC-1216_CLA.a

```
1  ;Program to stimulate the machine for CLA
2
3  INP         ;Taking input
4  CLA         ;Clearing AC
5  OUT         ;Printing output
6  HLT         ;Halting
7
```

## 6. Output

```
EXECUTING...
Enter Inputs, the first of which must be an Integer: 12
Output:  0
EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HLT]
```

### Contents of registers

AC-1216_Machine_I

File Edit Modify Execute Help

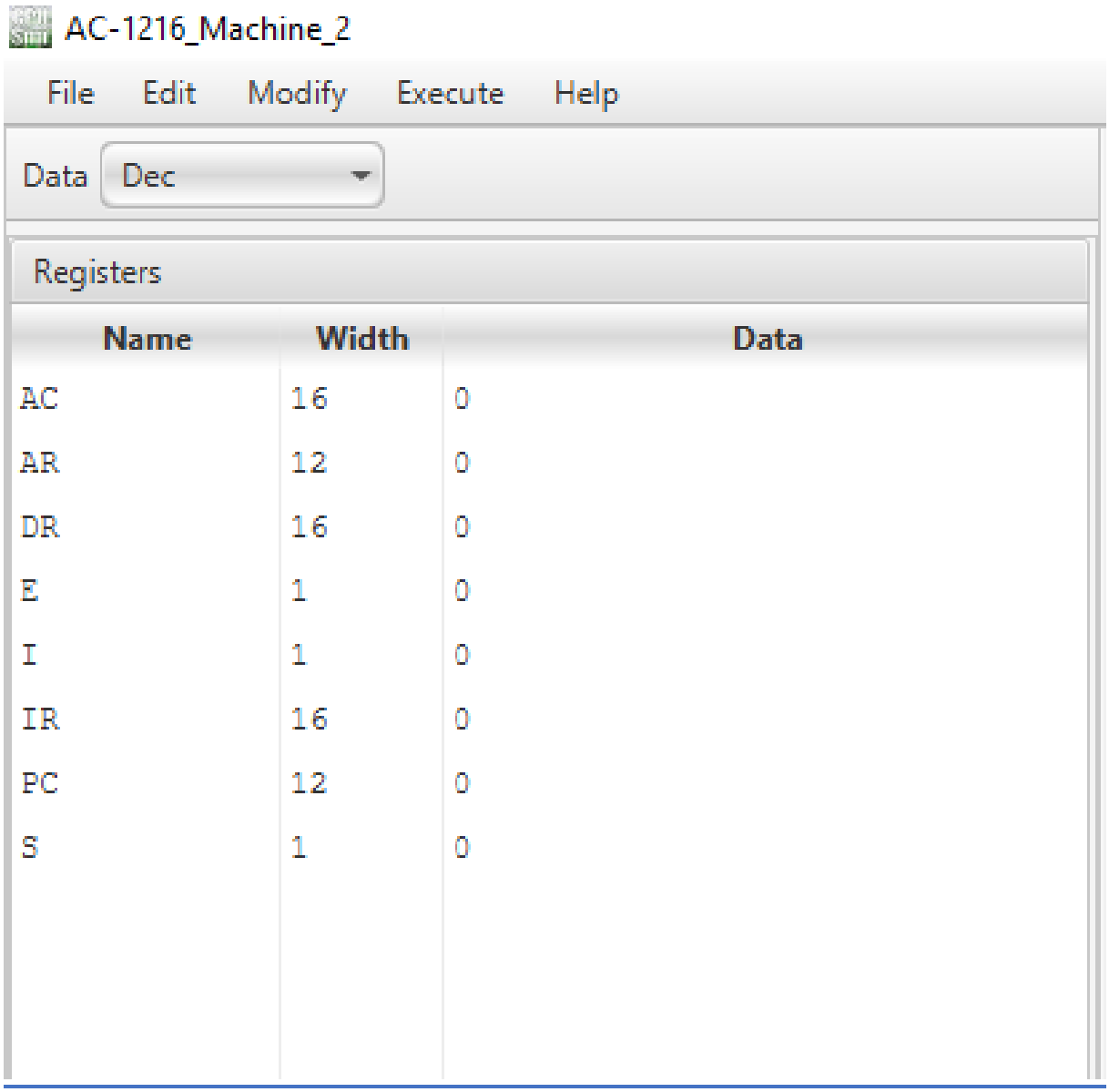
Data Dec

Registers

| Name | Width | Data |
|---|---|---|
| AC | 16 | 0 |
| AR | 12 | 768 |
| DR | 16 | 0 |
| E | 1 | 0 |
| I | 1 | 0 |
| IR | 16 | 768 |
| PC | 12 | 4 |
| S | 1 | -1 |

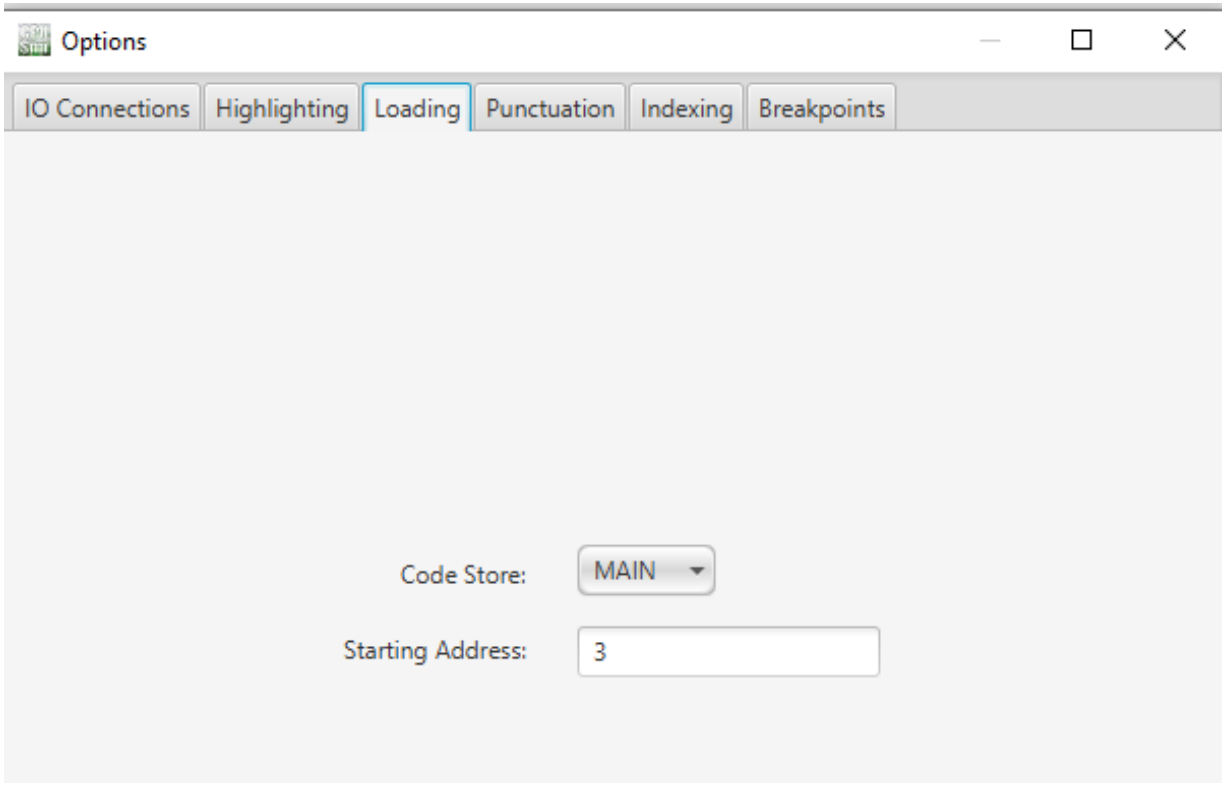
**Q2. Write an assembly program to stimulate the machine 2 for addition of two numbers with I=0 and address part=055 . The instruction to be stored at address 03 in RAM , initialize the memory word at address 055 with the operand 650 and AC=525. Determine the contents of AC , DR , PC , AR and IR in decimal after the execution.**

## 1. Registers

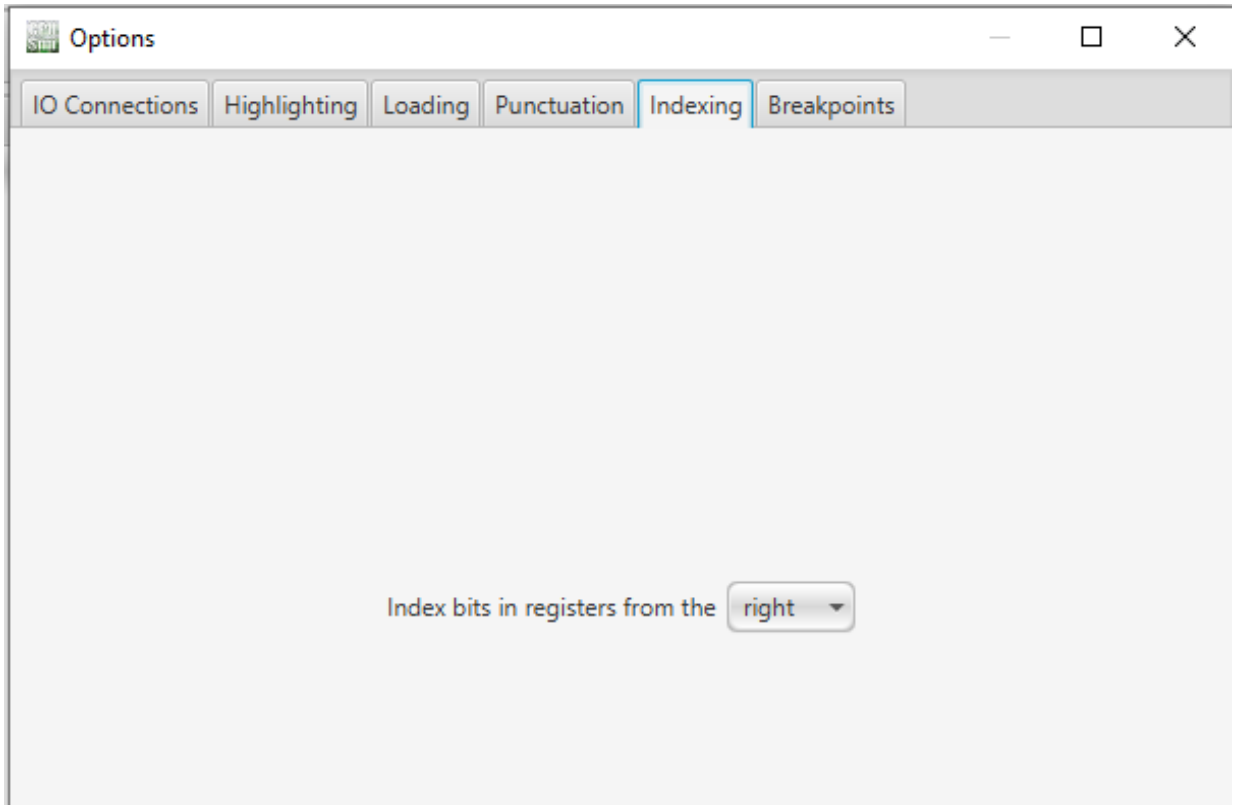



| Name | Width | Data |
|---|---|---|
| AC | 16 | 0 |
| AR | 12 | 0 |
| DR | 16 | 0 |
| E | 1 | 0 |
| I | 1 | 0 |
| IR | 16 | 0 |
| PC | 12 | 0 |
| S | 1 | 0 |

## 2. Loading



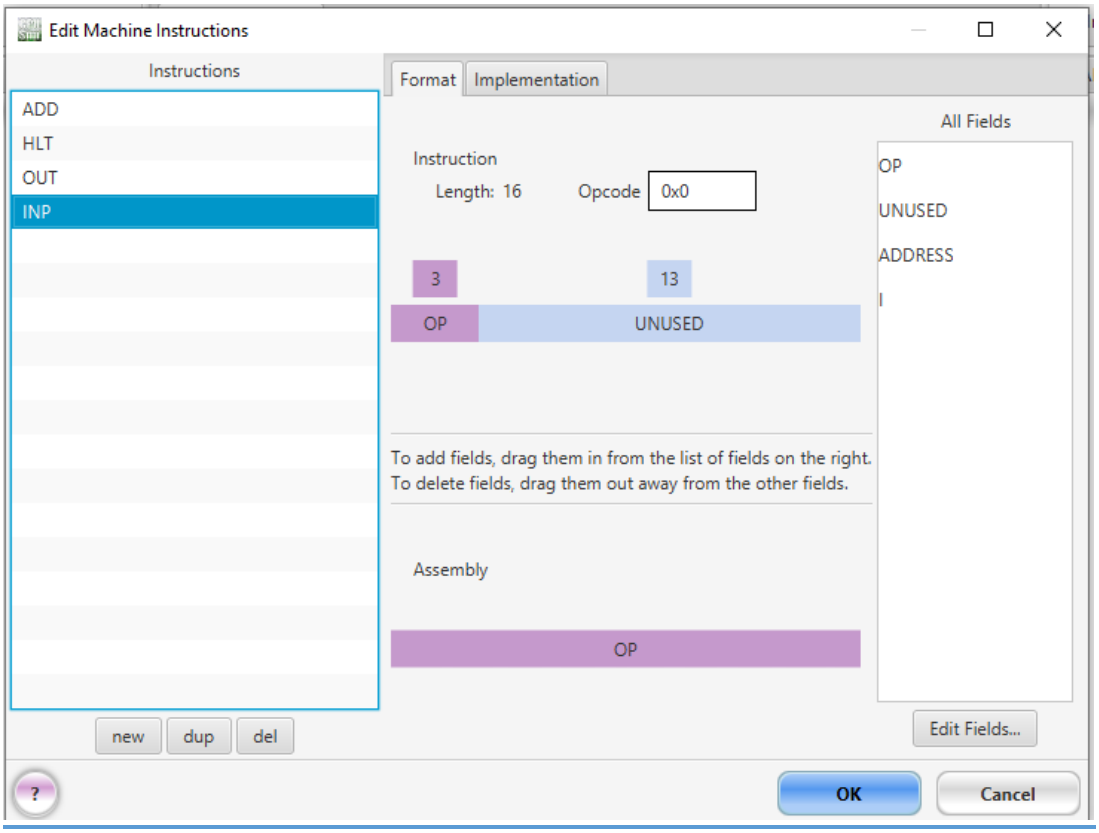

## 3. Indexing



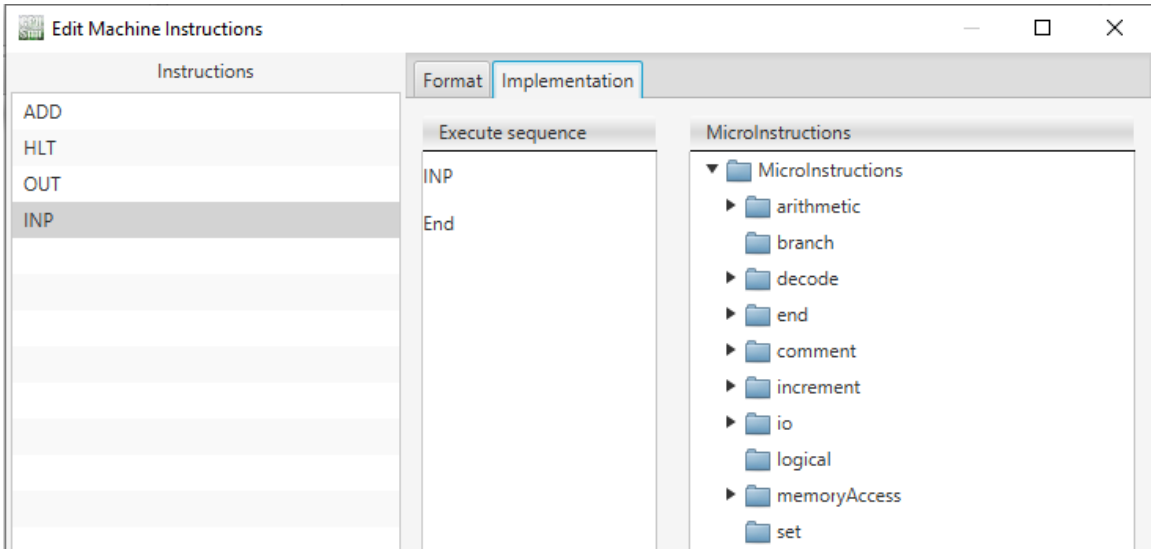
# 4. Machine Instructions

## I. Input

- **Format**

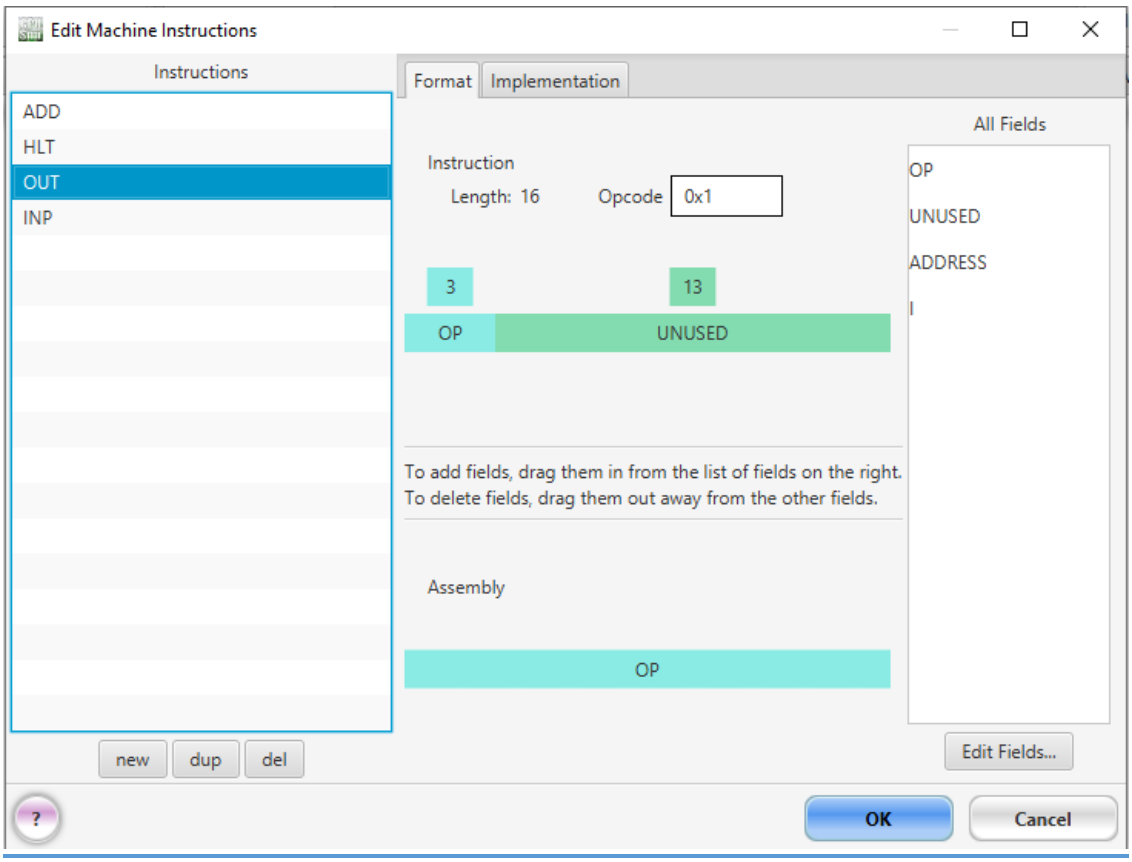



- **Implementation**

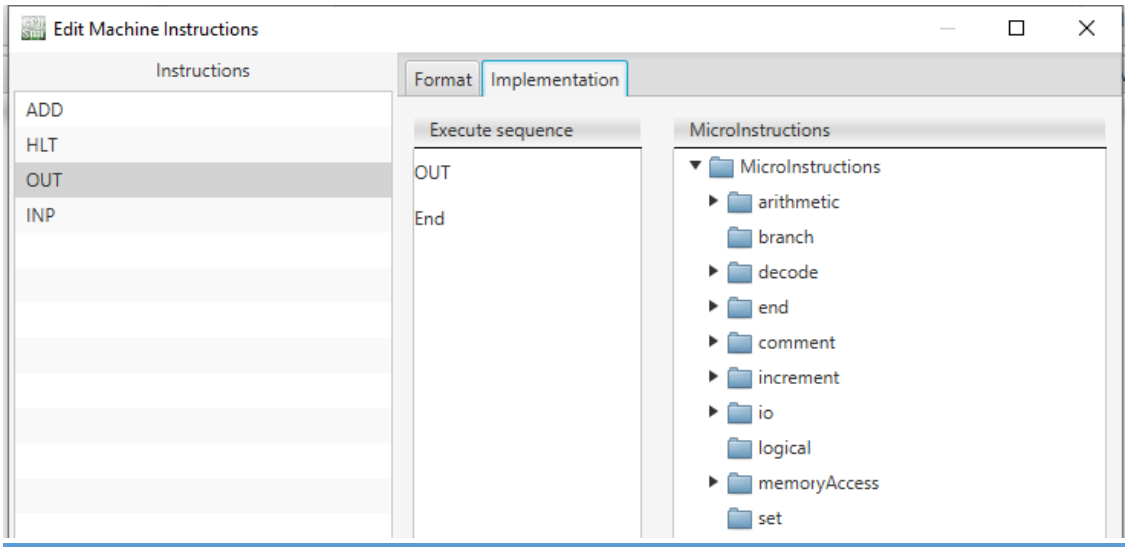


# II. Output

- **Format**

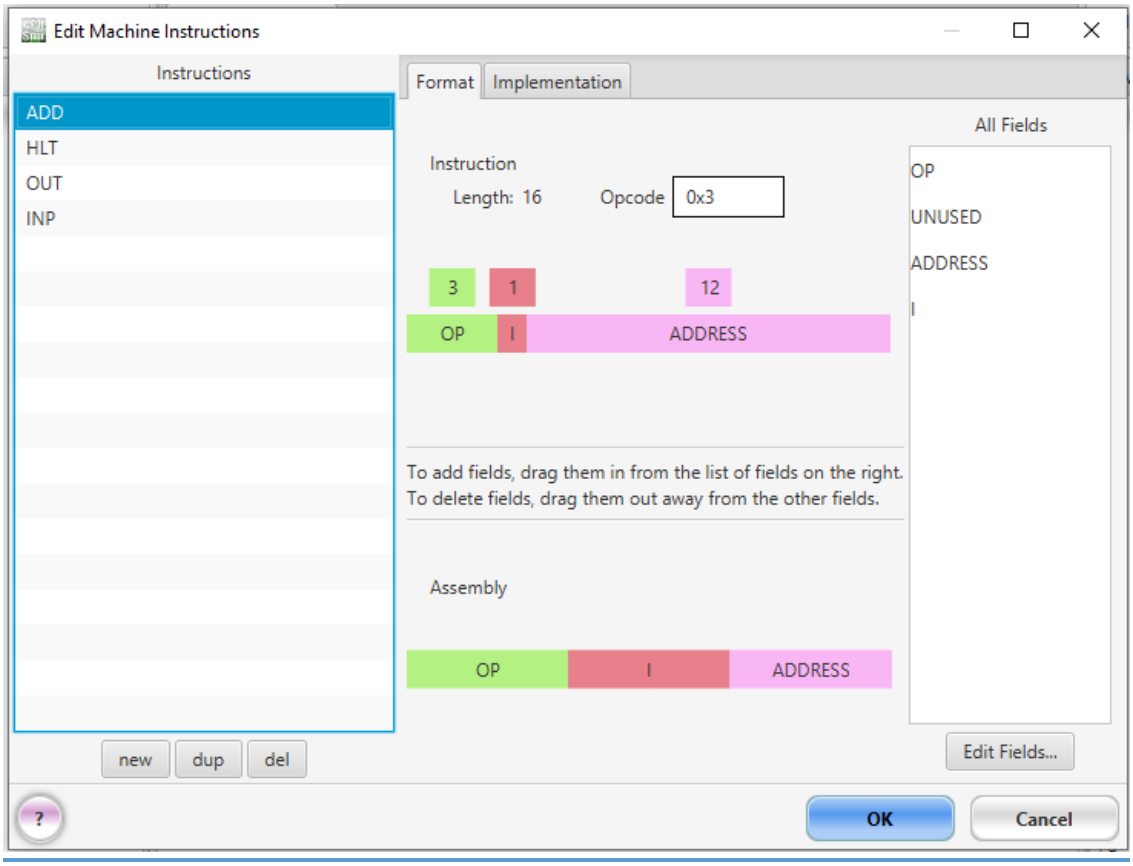



- **Implementation**

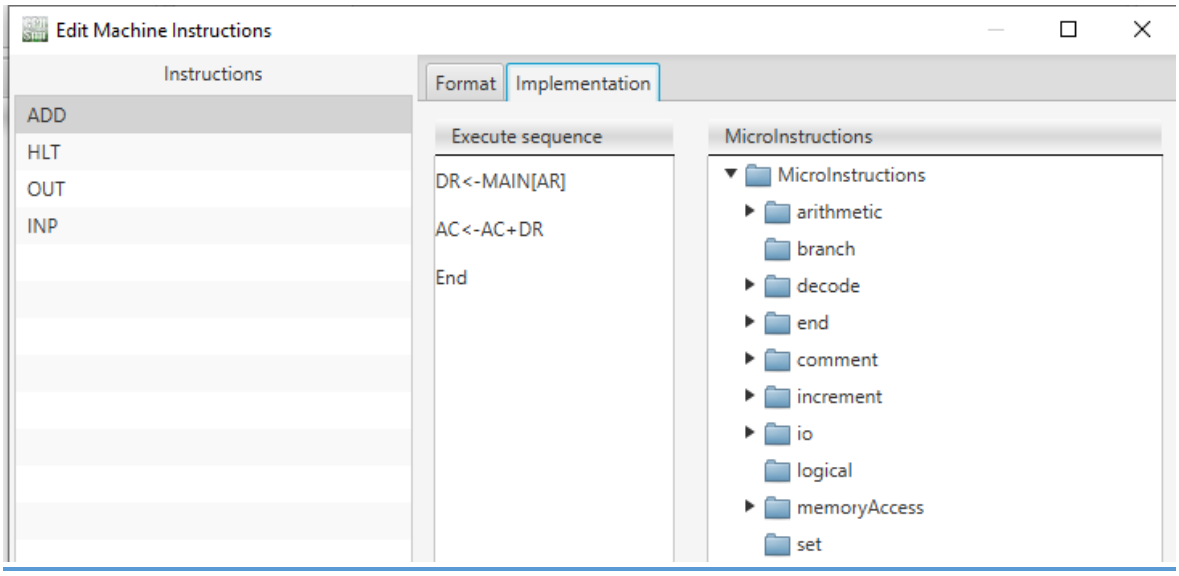


# III. ADD

- **Format**

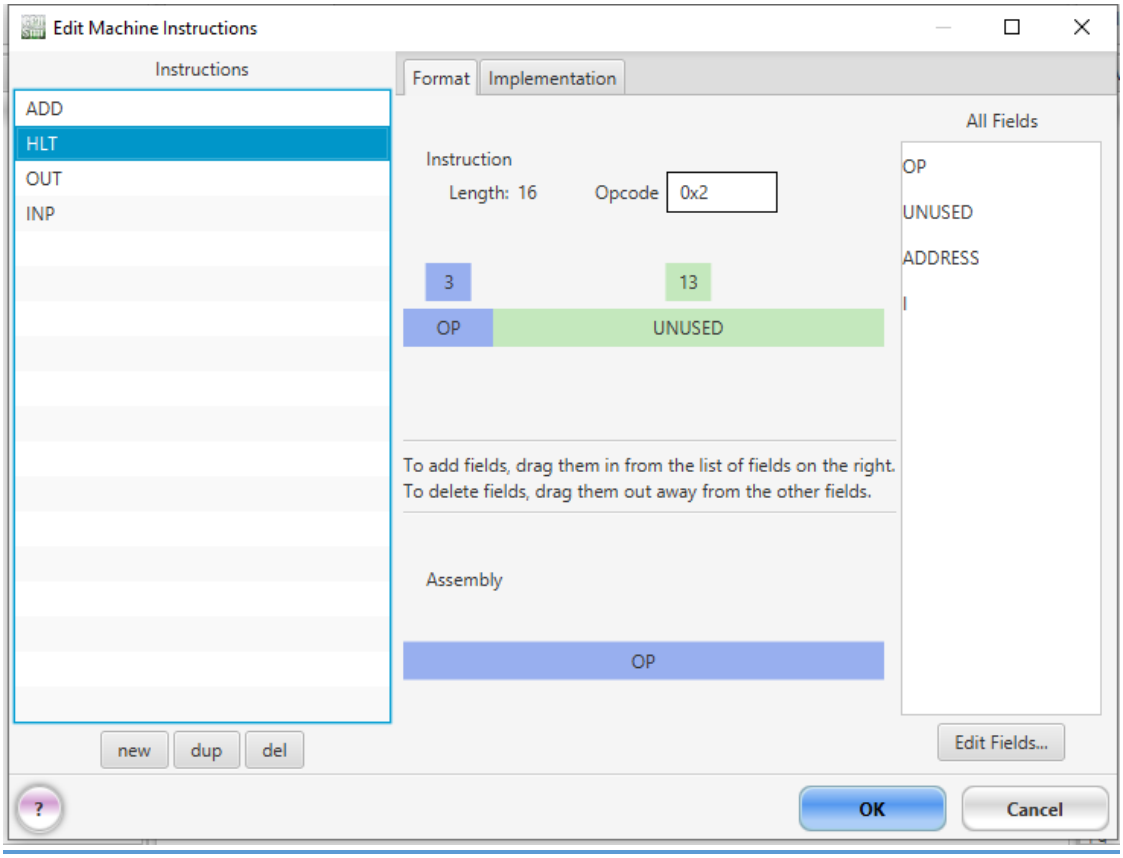



- **Implementation**

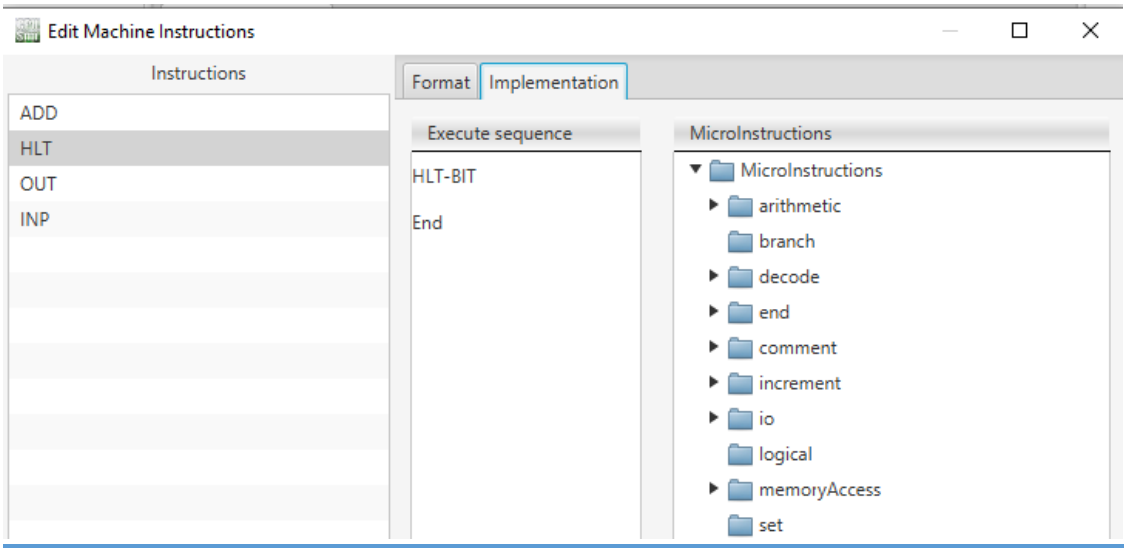


# IV. HALT

- **Format**




- **Implementation**



## 5. Text file

AC-1216_ADD.a

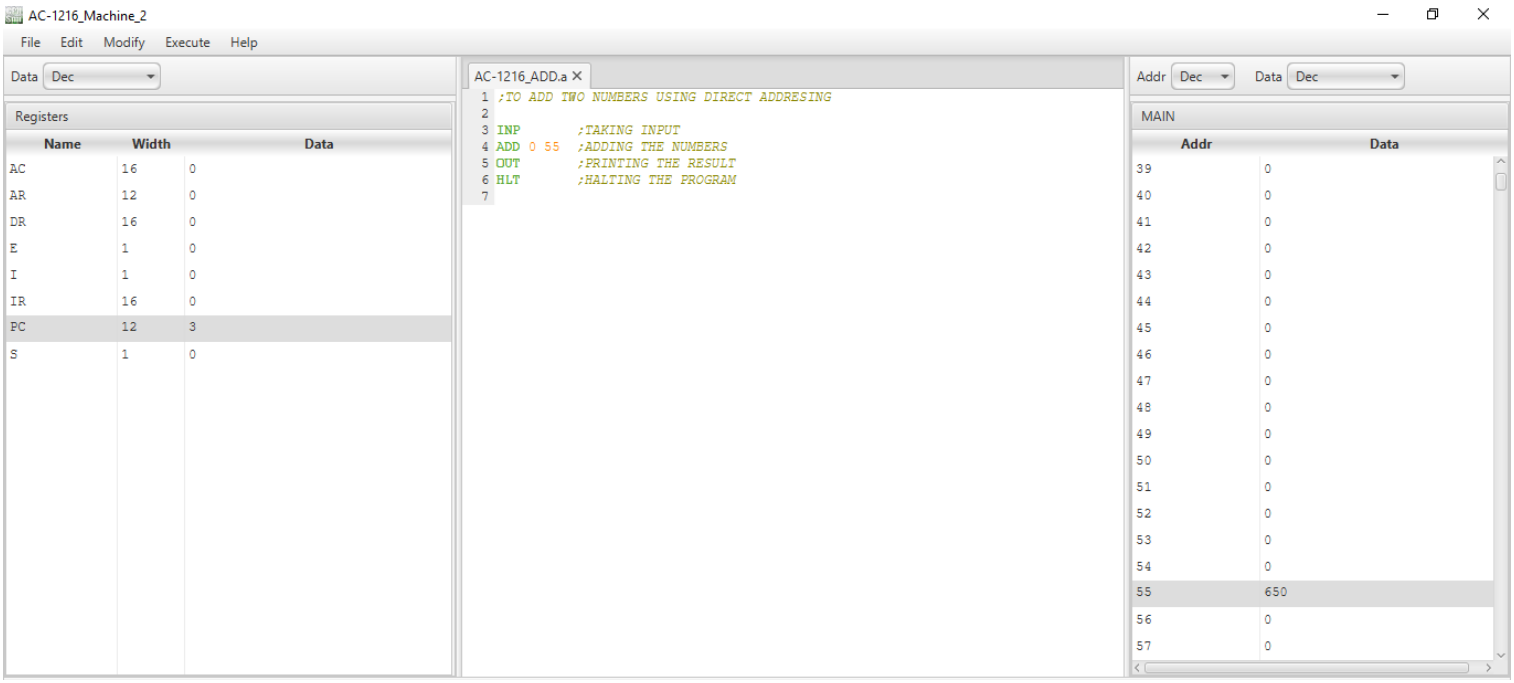
```
;TO ADD TWO NUMBERS USING DIRECT ADDRESING

INP         ;TAKING INPUT
ADD  0  55  ;ADDING THE NUMBERS
OUT         ;PRINTING THE RESULT
HLT         ;HALTING THE PROGRAM

```

## 6. Output

### Assembling and loading



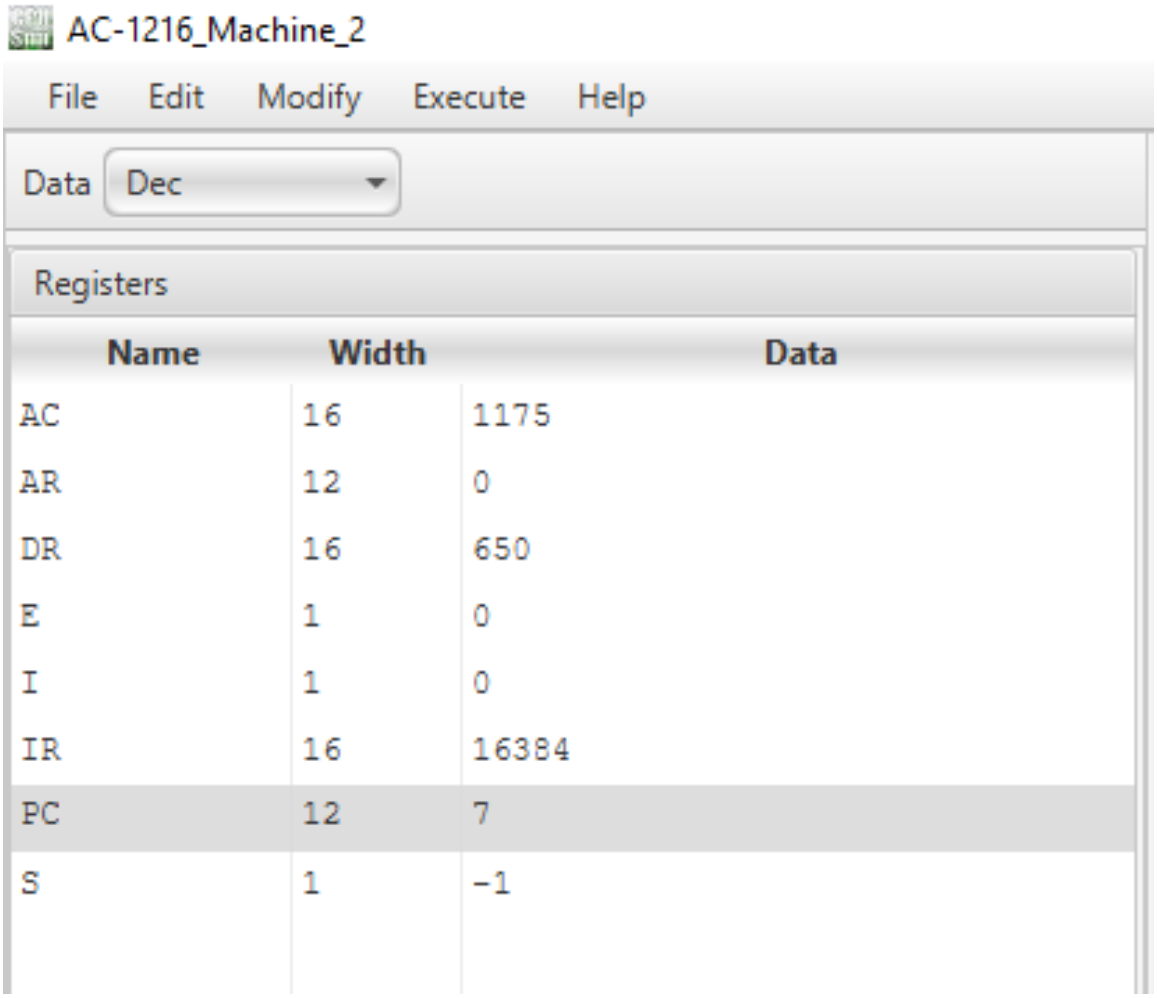
## Giving input to AC

```
EXECUTING...
Enter Inputs, the first of which must be an Integer: 525
```

## Final output

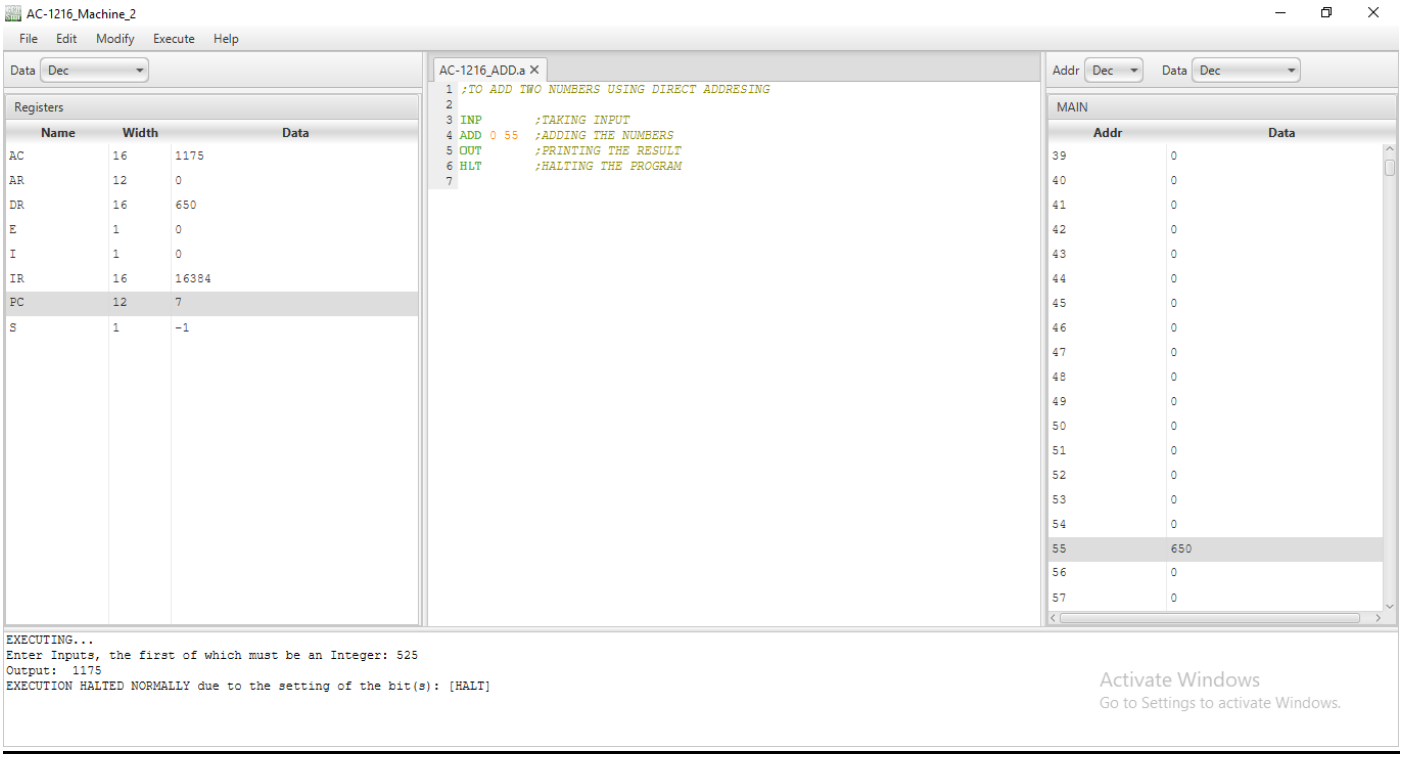
```
EXECUTING...
Enter Inputs, the first of which must be an Integer: 525
Output:  1175
EXECUTION HALTED NORMALLY due to the setting of the bit(s): [HALT]
```

## Contents of registers




| Name | Width | Data |
|---|---|---|
| AC | 16 | 1175 |
| AR | 12 | 0 |
| DR | 16 | 650 |
| E | 1 | 0 |
| I | 1 | 0 |
| IR | 16 | 16384 |
| PC | 12 | 7 |
| S | 1 | -1 |

## Overall Output

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## Name -> Harsh Bamotra

## Roll No.-> AC-1216