ENGR101 Assignment 2

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Core 1:

```
INP
STO 90
HLT
```

Core 2:

The program from core one tells LMC to take the input provided (INP), then to store it in memory slot 90 (STO 90) after which it halts the program (HLT).

Completion 1:

```
INP
STO 7
INP
STO 8
INP
STO 9
HLT
```

I chose locations 7,8, and 9 because they are after the HLT command and therefor wont over write or break the code.

Challenge 1:

Input the number, then subtract the value 999 from it and then store it in the memory, when outputted, add 999 to it again and then output.

```
INP
SUB A
STO 90
ADD A
OUT
HLT
DAT A 999
```

Core 3:

Line Executed	PgC	Opcode	Input	"Result"	Memory Cell 15
Before Execution Starts	0	---	30	000	000
INP	0	901	30	30	000
STO 15	1	315	30	30	30
INP	2	901	33	33	30
ADD 15	3	115	33	63	30
OUT	4	902	33	63	30
HLT	5	000	33	63	30

Core 4:

INP
STO 15
INP
STO 16
SUB 15
OUT
HLT

Completion 2:

No it will not give the desired result as it is doing OUT = IN3 – (IN1 + IN2)
INP
STO 99
INP
ADD 99
STO 99
INP
STO 98
LDA 99
SUB 98
OUT
HLT

Core 5:

```
LDA A
STO 10
LDA B
STO 11
LDA C
STO 12
HLT
DAT A 1
DAT B 2
DAT C 3
```

The program is now longer so the variables must be stored in a new location to stop them overwriting the code.

Core 6:

```
INP
STO A
INP
STO B
LDA 32
ADD 39
OUT
HLT
DAT B 39
DAT A 32
```

Core 7:

```
LDA 90
ADD A
STO 90
BRA 0
DAT A 1
```

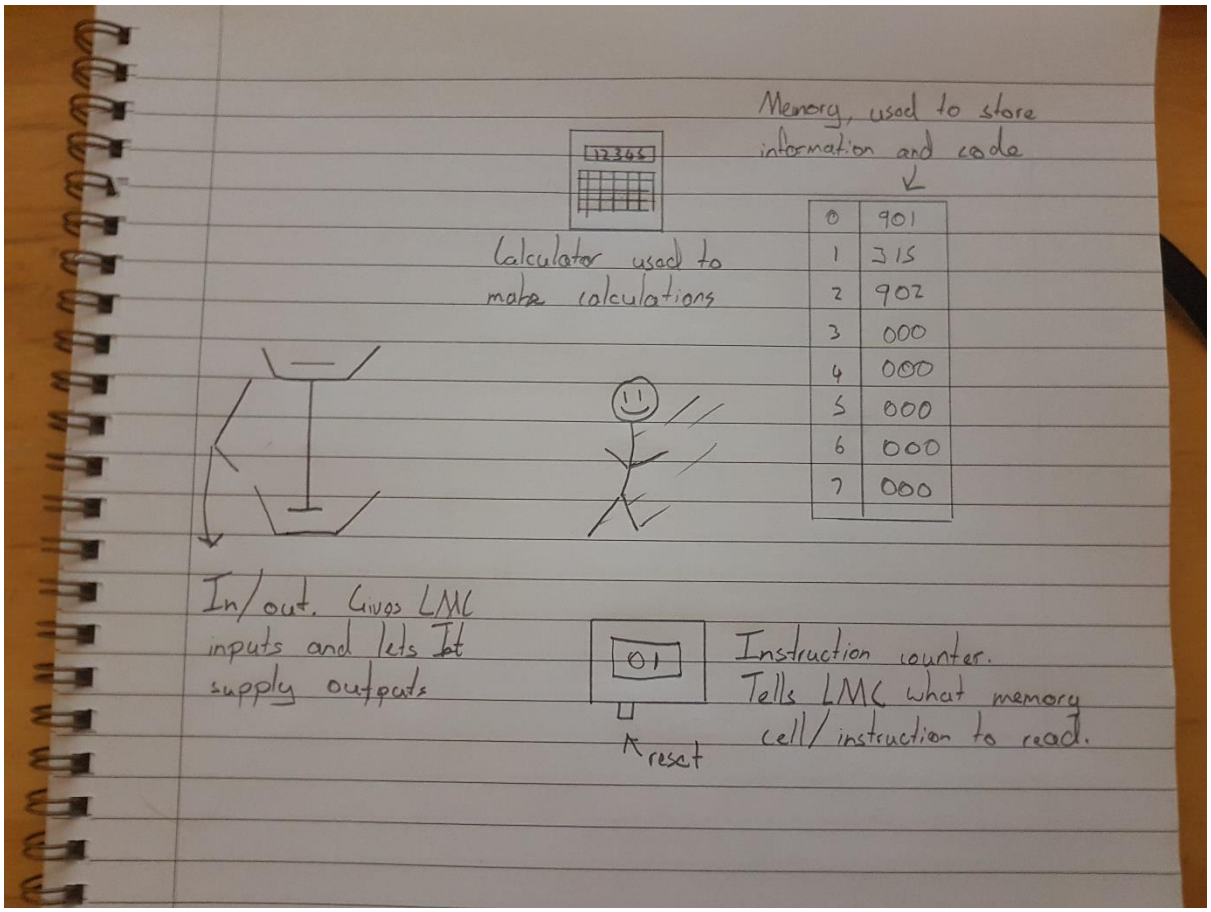
Completion 3:

```
LDA A
STO 98
LDA B
STO 99
SUB 98
OUT
STO 99
BRP 4
HLT
DAT A 1
DAT B 5
```

Challenge 2:

```
LDA A
STO 98
LDA B
STO 97
INP
STO 99
INP
SUB 99
BRZ 10
BRA 13
LDA 98
OUT
HLT
LDA 97
OUT
HLT
DAT A 1
DAT B 0
```

Core 8:



Challenge 3 (Bonus Marks Only):

```
LDA Z
STO 16
LDA C
STO 99
LDA 3
SUB F
STO 3
LDA 16
SUB F
STO 16
BRZ 12
BRA 2
HLT
DAT C 999
DAT F 1
DAT Z 83
```