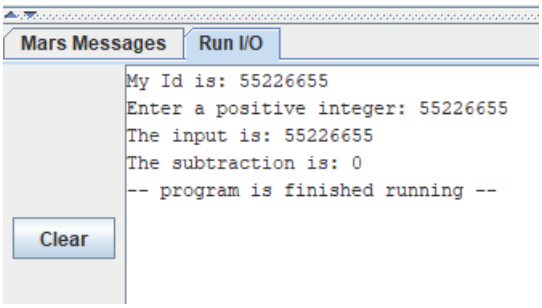
Procedures:

1. The program first displays the ID number of one team member. In this case, it is 55226655.
2. Then, the program asks the user for input.
3. After input, the program will run and calculate the answer.



Implementations:

1. For the initialization part
    a. myId is used to display the message “My Id is: “.
    b. inputMsg is used to display the message “The input is: “.
    c. subMsg is used to display the message “The subtraction is: “ with new line
    d. prompt is the message to ask for user input.
    e. wrongOut is the message to display when use input is not accepted
    f. id is used to initialize the id of our group member id

cs2115.asm

```
1  .data
2      myId: .asciiz "My Id is: "
3      inputMsg: .asciiz "The input is: "
4      subMsg: .asciiz "\nThe subtraction is: "
5      prompt: .asciiz "\nEnter a positive integer: "
6      wrongOut: .asciiz "\nNegative result exception!"
7      id: .word 55226655
```

2. Details of implementation

a.
```
12      li $v0, 4
13      la $a0, myId
14      syscall
```

Line 12-14 is used to display the String (myId) which is “My Id is:”

b.
```
16      li $v0, 1
17      lw $a0, id
18      move $t1, $a0
19      syscall
```

Line 16-19 is used to output the integer (id) which is “55226655”

c.
```
21      li $v0, 4
22      la $a0, prompt
23      syscall
```

Line 21-23 is used to display the String (prompt) which is “Enter a positive integer:”

d.
```
25      li $v0, 5
26      syscall
```

Line 25-26 is used to ask the user for input

e.
```
28      move $t0, $v0
```

Line 28 Save the data in $v0 (input) to $t0, so that we can access the input later

f.
```
30      li $v0, 4
31      la $a0, inputMsg
32      syscall
33
34      li $v0, 1
35      move  $a0, $t0
36      syscall
```

Line 30-32 is used to display the String (inputMsg) and display the input from the user.

g.
```
38      sub $t2, $t1, $t0
39
40      slt $t4, $t2, $zero
41      beq $t4, $zero, L1
42      bne $t4, $zero, L2
```

Line 38 is used to implement subtraction

Line 40 is used to run the if else loop: If the number < 0, $t4=1, else $t4=0;

Line 41-42 is used to check the value of $t4. If $t4=0, go to the procedure L1, else run L2.

h.
```
44      L1:
45          li $v0, 4
46          la $a0, subMsg
47          syscall
48
49          li $v0, 1
50          move $a0, $t2
51          syscall
52          j ex
```

Line 44 is used to state the procedure L1.

Line 45-47 is used to display the String (subMsg)

Line 49-51 is used to move the number after subtraction into $a0, and output it.

Line 52 is used to jump the procedure to ex, in order to prevent it run L2.

i.
```
54      L2:
55          li $v0, 4
56          la $a0, wrongOut
57          syscall
58          j ex
```

Line 54 is used to state the procedure L2.

Line 55-57 is used to display the String (wrongMsg)

Line 58 is used to jump the procedure to ex.

j.
```
60      ex:
61          li $v0, 10
62          syscall
```

Line 60-62 is used to state the procedure ex: end and exit the program.