**FACULTY OF COMPUTING AND INFORMATICS**

**TCP1101 PROGRAMMING FUNDAMENTALS**

**TRIMESTER 2 2020/2021**

# Assignment #2
# Report

Lecture Section : TC1V

Tutorial Section : TT1V

**INSTRUCTOR'S NAME :** <u>Sharaf Eldeen Sami Mohammed Al Horani</u>

| Student ID | Name | Email Address | Phone No. |
|---|---|---|---|
| 1201302646 | Cho Xuan Xian | 1201302646@student.mmu.edu.my | +601155086875 |
| 1201302263 | Intan Khairina Adlina bt. Ahmd | 1201302263@student.mmu.edu.my | +60167747312 |
| 1201302882 | Angel Phang Ting Ting | 1201302882@student.mmu.edu.my | +601111277520 |

# Introduction

This program is named "Let's Explore Mars!" in the interest of its program function to explore Mars and collect all the golds that are distributed all around Mars. The aim we look forward to while creating this program is, to search and collect the golds on Mars by controlling the new Mars Rover.

Listed below are the purposes of the program and what the program does.

## The purposes of the program:

Based on the experiment conducted by NASA, regarding the rover Curiosity that landed on Mars. In which, the rover is designed to carry out scientific data collection and analysis in preparation of a manned mission to Mars. With the same idea proposed by NASA for the Rover, this program is offering the same purpose for the Rover in which "gold" is representing the scientific data.

- ❏ To explore Mars by the rover itself.
- ❏ To allow the rover to collect all of the gold on the surface of Mars.
- ❏ To control the rover according to the commands.
- ❏ To calculate the number of gold collected.
- ❏ To collect the geography data on Mars.

## What are the abilities of the program?

❏ To accept values from users for dimension X and Y which are representing the column and row of the map.

❏ To accept the total number of gold to be hidden in the map from the users.

❏ The program will set and size map according to the values input by users.

❏ Once the map is sized and set, the program will randomly distribute the obstacles (#), traps (X) and golds ($) all over the map.

❏ To accept a string of commands from the user, for example "LLMMRRQ".

❏ According to the string of command input by users, it will hence reflect on the action of the rover.

❏ The programs contain a scoring system, in which after every string of command is executed, the scoring board will be displayed and updated.

❏ The program will be reset once the users choose to continue using the program at the end of the exploration.

# User Manual / Instructions

## Start

At the beginning, we designed a horizontal shifting function. The words "Welcome to Mars" will shift from right to left. After that, users are required to press any key on the keyboard to proceed to the next part.

## Next

Firstly, users need to input the initial values of dimension X, dimension Y and number of golds of Mars. Mars dimension X is representing the column of the map and Mars dimension Y is the row of the map. These values are then used by the program to create the map.

Users need to collect all the golds that are set previously to achieve victory. To control the rover, users are required to input a string of commands to move the rover and collect the golds. Here are some brief introductions to the commands and symbols in the program.

```
----------------------------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
----------------------------------------------------------

Total Command Sequences [S] = 0
Total Commands [C] = 0
Total Golds [G] = 0 out of 4
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 0

Example Command Sequences: MMLLRMMRMLQ
```

Figure above is an example of commands, symbols and a scoring table.

## Commands that can use by the user:

❖ M : Move the rover one step forward.

❖ L : Turn the rover to the left.

❖ R : Turn the rover to the right.

❖ Q : Quit the game.

An example of command is "LMMR" in which the rover will turn left, move two steps, and then turn right. Users are required to enter the letter "Q" to end the game.

## Symbols appear on the map:

❖ > : Rover.

❖ $ : Gold.

❖ X : Hill (obstacle).

❖ # : Trap.

After the rover successfully collects the golds, the number of golds will be implemented to one out of the total number of golds and will be displayed and updated to the scoring system.

Thirdly, if the users encounter a hill, users need to control the rover to bypass the hill which will block the route of the rover by turning the direction of the rover using command Left or Right. The most important thing is that users need to be careful about traps. If the rover accidentally steps into the trap, the mission will FAIL and the game will end.

## END

After the game ends (either mission failed or accomplished), users will be given an option to either continue using the program by playing again or quit from the program. To choose the option, users are required to enter 'y' to continue using the program or 'n' to quit. If the user chooses to play again, users are required to re-input the dimensions of the map and no. of golds again to start a new round of the game.

Lastly, we have created an ending scene at the end of the program.

# Screenshots

```
   W W W   EEEEE  L         CCCC   OOO    M   M  EEEEE        TTTTT   OOO          M   M   AAA   RRRRR  SSSSS
   W W W   E      L        C      O   O  M M M  E               T    O   O        M M M   A   A  R   R  S
   W W W   EEEEE  L        C      O   O  M M M  EEEEE           T    O   O        M M M  AAAAA  RRRRR  SSSSS
   W W W   E      L        C      O   O  M M M  E               T    O   O        M M M   A   A  R  R       S
    W W    EEEEE  LLLLL     CCCC   OOO    M   M  EEEEE           T     OOO          M M M   A   A  R   R  SSSSS

Press any key to continue . . . ▊
```

```
 --_ --_ --_ --_ --_ --_ --_ --_
 = Curiosity, welcome to Mars! =
 --_ --_ --_ --_ --_ --_ --_ --_
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 5|?|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 4|?|?|?|?|?|?|?| |?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 3|?|?|?|?|?|?|>| |?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 2|?|?|?|?|?|?|?|$|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 1|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
               1 1 1 1 1
 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

----------------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; ▊ = Hills ; # = Trap                       |
----------------------------------------------

Total Command Sequences [S] = 0
Total Commands [C] = 0
Total Golds [G] = 0 out of 4
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 0

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => mrmrmm▊
```

```
 --_ --_ --_ --_ --_ --_ --_ --_
 = Curiosity, welcome to Mars! =
 --_ --_ --_ --_ --_ --_ --_ --_
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 5|?|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 4|?|?|?|?|?|?|?| |?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 3|?|?|?|?|?|?|>| |?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 2|?|?|?|?|?|?|?|$|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 1|?|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
               1 1 1 1 1
 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

Command = m ...
▊
```

```
 --_ --_ --_ --_ --_ --_ --_ --_
 = Curiosity, welcome to Mars! =
 --_ --_ --_ --_ --_ --_ --_ --_
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 5|?|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 4|?|?|?|?|?|?|?| |▊|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 3|?|?|?|?|?|?|?| |>| |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 2|?|?|?|?|?|?|?|?|$| |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 1|?|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
               1 1 1 1 1
 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

Command = m [executed]▊
```

```
 --_ --_ --_ --_ --_ --_ --_ --_
 = Curiosity, welcome to Mars! =
 --_ --_ --_ --_ --_ --_ --_ --_
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 5|?|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 4|?|?|?|?|?|?|?| |▊|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 3|?|?|?|?|?|?| | | |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 2|?|?|?|?|?|?|?|▊|<| |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
 1|?|?|?|?|?|?|?| | |▊|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
               1 1 1 1 1
 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

Route is BLOCKED, please turn left or right...
Press any key to continue . . . ▊
```

```
   __ __ __ __ __ __ __ __ _
 = Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ __
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
5|?|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
4|?|?|?|?|?|?|?| |▓|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
3|?|?|?|?|?|?|?| | | |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
2|?|?|?|?|?|?|?|▓|<| |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
1|?|?|?|?|?|?|?| |▓|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
              1 1 1 1 1
    1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

  --------------------------------------------------
 | Mission : Get all the GOLDs and do not fall in TRAPs !!! |
 | L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
 | $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
  --------------------------------------------------

Total Command Sequences [S] = 1
Total Commands [C] = 6
Total Golds [G] = 1 out of 4
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 39

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => rmlmmmm
```

```
   __ __ __ __ __ __ __ __ _
 = Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ __
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
5|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
4|?|?|?| | |#| | | |▓|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
3|?|?|?|#|<| | | | | |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
2|?|?|?|$|$|▓| |▓| | |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
1|?|?|?|?|?|?| | |▓|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
              1 1 1 1 1
    1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

  --------------------------------------------------
 | Mission : Get all the GOLDs and do not fall in TRAPs !!! |
 | L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
 | $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
  --------------------------------------------------

Total Command Sequences [S] = 2
Total Commands [C] = 13
Total Golds [G] = 1 out of 4
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 27

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences =>
```

```
   __ __ __ __ __ __ __ __ _
 = Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ __
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
5|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
4|?|?|?| | |#| | | |▓|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
3|?|?|?|#|<| | | | | |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
2|?|?|?|$|$|▓| |▓| | |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
1|?|?|?|?|?|?| | |▓|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
              1 1 1 1 1
    1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

  --------------------------------------------------
 | Mission : Get all the GOLDs and do not fall in TRAPs !!! |
 | L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
 | $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
  --------------------------------------------------

Total Command Sequences [S] = 2
Total Commands [C] = 13
Total Golds [G] = 1 out of 4
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 27

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => lmrm
```

```
   __ __ __ __ __ __ __ __ _
 = Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ __
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
5|?|?|?|?|?|?|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
4|?|?|?| | |#| | | |▓|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
3|?|?| |#| | | | | | |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
2|?|?| |<| |▓| |▓| | |?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
1|?|?|#| |$| |?| |▓|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
              1 1 1 1 1
    1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

  --------------------------------------------------
 | Mission : Get all the GOLDs and do not fall in TRAPs !!! |
 | L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
 | $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
  --------------------------------------------------

Total Command Sequences [S] = 3
Total Commands [C] = 17
Total Golds [G] = 3 out of 4
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 118

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => lmlm
```

```
Total Command Sequences [S] = 4
Total Commands [C] = 21
Total Golds [G] = 4 out of 4
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 159

Congratz, Mission ACCOMPLISHED!!

Do you want to see the Map of Mars? (y/n) => y

   __ __ __ __ __ __ __ __ _
 = Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ __
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
5| |▓|▓| | |▓|▓| | | | |#| | | |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
4| |▓| | | |#| | | |▓|▓| | | | |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
3| | | |#| | | | | | |▓| | | | |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
2| | | | |▓| |▓| | | | | | | | |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
1| |#|#| | | | | | |▓|▓| | | | |
  +-+-+-+-+-+-+-+-+-+-+-+-+-+-+
              1 1 1 1 1
    1 2 3 4 5 6 7 8 9 0 1 2 3 4 5

Do you want to PLAY AGAIN (y/n) ? => y
```

```
Please input values of x for coloumns and y for rows of the map.
Lets Explore Mars....
Mars dimension X => 8
Mars dimemsion Y => 4
No. of golds => 3
```

```
 --__--__--__--__--__--__--__--
= Curiosity, welcome to Mars! =
__--__--__--__--__--__--__--__-
 +-+-+-+-+-+-+-+-+
4|?|?|?|?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
3|?|?| |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
2|?|?|$|<|?|?|?|?|
 +-+-+-+-+-+-+-+-+
1|?|?| |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+

  1 2 3 4 5 6 7 8


 ---------------------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; █ = Hills ; # = Trap                       |
 ---------------------------------------------------

Total Command Sequences [S] = 0
Total Commands [C] = 0
Total Golds [G] = 0 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 0

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => mmrmm
```

```
 --__--__--__--__--__--__--__--
= Curiosity, welcome to Mars! =
__--__--__--__--__--__--__--__-
 +-+-+-+-+-+-+-+-+
4| |^|#|?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
3| | | |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
2| | | | |?|?|?|?|
 +-+-+-+-+-+-+-+-+
1|$|$| |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+

  1 2 3 4 5 6 7 8


 ---------------------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; █ = Hills ; # = Trap                       |
 ---------------------------------------------------

Total Command Sequences [S] = 1
Total Commands [C] = 5
Total Golds [G] = 1 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 40

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => rm
```

```
 --__--__--__--__--__--__--__--
= Curiosity, welcome to Mars! =
__--__--__--__--__--__--__--__-
 +-+-+-+-+-+-+-+-+
4| | |@|?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
3| | | |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
2| | | | |?|?|?|?|
 +-+-+-+-+-+-+-+-+
1|$|$| |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+

  1 2 3 4 5 6 7 8


 ---------------------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; █ = Hills ; # = Trap                       |
 ---------------------------------------------------

Total Command Sequences [S] = 1
Total Commands [C] = 5
Total Golds [G] = 1 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 40

ROVER IS TRAPPED !!! Mission Failed !!!

Do you want to see the Map of Mars? (y/n) => n
Do you want TO PLAY AGAIN (y/n) ? => y
```

```
Please input values of x for coloumns and y for rows of the map.
Lets Explore Mars....
Mars dimension X => 8
Mars dimemsion Y => 4
No. of golds => 3
```

```
 __ __ __ __ __ __ __ __
= Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ _
  +-+-+-+-+-+-+-+-+
4|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+
3|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+
2|?|?|?|v|?|?|?|?|
  +-+-+-+-+-+-+-+-+
1|?|?| | | |?|?|?|
  +-+-+-+-+-+-+-+-+

  1 2 3 4 5 6 7 8

 --------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
 --------------------------------------

Total Command Sequences [S] = 0
Total Commands [C] = 0
Total Golds [G] = 0 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 0

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => rrr
```

```
 __ __ __ __ __ __ __ __
= Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ _
  +-+-+-+-+-+-+-+-+
4|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+
3|?|?| | | |?|?|?|
  +-+-+-+-+-+-+-+-+
2|?|?| |>| |?|?|?|
  +-+-+-+-+-+-+-+-+
1|?|?| | | |?|?|?|
  +-+-+-+-+-+-+-+-+

  1 2 3 4 5 6 7 8

 --------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
|--------------------------------------|
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
 --------------------------------------

Total Command Sequences [S] = 1
Total Commands [C] = 3
Total Golds [G] = 0 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = -8

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => mm
```

```
 __ __ __ __ __ __ __ __
= Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ _
  +-+-+-+-+-+-+-+-+
4|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+
3|?|?| | | | | |?|
  +-+-+-+-+-+-+-+-+
2|?|?| | | |>| |?|
  +-+-+-+-+-+-+-+-+
1|?|?| | | | | |?|
  +-+-+-+-+-+-+-+-+

  1 2 3 4 5 6 7 8

 --------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
|--------------------------------------|
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
 --------------------------------------

Total Command Sequences [S] = 2
Total Commands [C] = 5
Total Golds [G] = 0 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = -15

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => mq
```

```
 __ __ __ __ __ __ __ __
= Curiosity, welcome to Mars! =
 __ __ __ __ __ __ __ __ _
  +-+-+-+-+-+-+-+-+
4|?|?|?|?|?|?|?|?|
  +-+-+-+-+-+-+-+-+
3|?|?| | | | | |$|
  +-+-+-+-+-+-+-+-+
2|?|?| | | |>| |
  +-+-+-+-+-+-+-+-+
1|?|?| | | | | | |
  +-+-+-+-+-+-+-+-+

  1 2 3 4 5 6 7 8

 --------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
|--------------------------------------|
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit     |
| $ = Gold[G] ; ▓ = Hills ; # = Trap                       |
 --------------------------------------

Total Command Sequences [S] = 2
Total Commands [C] = 5
Total Golds [G] = 0 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = -15

Quitted!! Mission Failed!!!

Do you want to see the Map of Mars? (y/n) => n
Do you want to PLAY AGAIN (y/n) ? => y
```

```
Please input values of x for coloumns and y for rows of the map.
Lets Explore Mars....
Mars dimension X => 8
Mars dimemsion Y => 4
No. of golds => 3
```

```
__ __ __ __ __ __ __ __
= Curiosity, welcome to Mars! =
__ __ __ __ __ __ __ __
 +-+-+-+-+-+-+-+-+
4|?|?|?|?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
3|?|?| |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
2|?|?| |<|?|?|?|?|
 +-+-+-+-+-+-+-+-+
1|?|?| |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+

 1 2 3 4 5 6 7 8

---------------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
|-------------------------------------------|
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit |
| $ = Gold[G] ; ▉ = Hills ; # = Trap |
---------------------------------------------

Total Command Sequences [S] = 0
Total Commands [C] = 0
Total Golds [G] = 0 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 0

Example Command Sequences: MMLLRMMRMLQ
Enter command sequences => Q
```

```
__ __ __ __ __ __ __ __
= Curiosity, welcome to Mars! =
__ __ __ __ __ __ __ __
 +-+-+-+-+-+-+-+-+
4|?|?|?|?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
3|?|?| |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+
2|?|?| |<|?|?|?|?|
 +-+-+-+-+-+-+-+-+
1|?|?| |?|?|?|?|?|
 +-+-+-+-+-+-+-+-+

 1 2 3 4 5 6 7 8

---------------------------------------------
| Mission : Get all the GOLDs and do not fall in TRAPs !!! |
|-------------------------------------------|
| L = Turn Left ; R = Turn Right ; M = Move ; Q = Quit |
| $ = Gold[G] ; ▉ = Hills ; # = Trap |
---------------------------------------------

Total Command Sequences [S] = 0
Total Commands [C] = 0
Total Golds [G] = 0 out of 3
Total Score = [G] x 50 - [S] x 5 - [C] x 1 = 0

Quitted!! Mission Failed!!!

Do you want to see the Map of Mars? (y/n) => n
Do you want to PLAY AGAIN (y/n) ? => n
```

```
-- --- --- --- --- --- --- --- --- --- ---

Departing from MARS...

-- --- --- --- --- --- --- --- --- --- ---

      T H A N K   Y O U
            A N D
      G O O D B Y E

-- --- --- --- --- --- --- --- --- --- --- --▉
```

# Assignment #2 Submission Declaration

**TCP1101 Programming Fundamentals**
**Trimester 2, Session 2020/2021**
*To be Filled by Each Student*

| | | | |
|---|---|---|---|
| **Name** | **Cho Xuan Xian** | | |
| **ID** | **1201302646** | | |
| **Lecture Section** | **TC1V** | **Tutorial Section** | **TT1V** |
| **Names and IDs of students which I have discussed regarding this assignment** | **Dylan Lim Yong Sen   1201302652** **Steven Tan Chung Hong   1201300636** **Chuah Jie Yi   1201302035** **Cho Xuan Xian   1201302646** **Angel Phang Ting Ting   1201302882** | | |
| **Number of hours I spent in doing this assignment** | **168 hours** | | |

I hereby declare that this assignment represents the work done by myself. I declare that no part of my work has been copied from other persons or by means of professional assistance.

I hereby declare, and I fully understood that, if I have copied any parts from any other persons OR if any other persons have copied from my work, I will get a mark of ZERO and I am fully responsible to ensure this does not happen.

I also hereby declare that every works or materials/codes that I may have borrowed, copied or modified from other sources are properly acknowledged in the report and the sources are listed in the ACKNOWLEDGEMENT or REFERENCES section. I will take full responsibility and understood that I would get a mark of ZERO if I failed to make proper acknowledgement.

12/3/2021

Signature: …………….................……… Date: ....................................................

Note: No work shall be accepted unless it is accompanied by this submission declaration with all sections completed and it has been signed and dated. Please scan the document and include this to the softcopy of your report.

# Assignment #2 Submission Declaration
## TCP1101 Programming Fundamentals
### Trimester 2, Session 2020/2021
*To be Filled by Each Student*

| Name | Intan Khairina Adlina bt. Ahmd | | |
|---|---|---|---|
| **ID** | 1201302263 | | |
| **Lecture Section** | TC1V | **Tutorial Section** | TT1V |
| **Names and IDs of students which I have discussed regarding this assignment** | Cho Xuan Xian   1201302646  Angel Phang Ting Ting   1201302882 | | |
| **Number of hours I spent in doing this assignment** | 168 hours | | |

I hereby declare that this assignment represents the work done by myself. I declare that no part of my work has been copied from other persons or by means of professional assistance.

I hereby declare, and I fully understood that, if I have copied any parts from any other persons OR if any other persons have copied from my work, I will get a mark of ZERO and I am fully responsible to ensure this does not happen.

I also hereby declare that every works or materials/codes that I may have borrowed, copied or modified from other sources are properly acknowledged in the report and the sources are listed in the ACKNOWLEDGEMENT or REFERENCES section. I will take full responsibility and understood that I would get a mark of ZERO if I failed to make proper acknowledgement.

12/3/2021

Signature: ……………..............……… Date: ....................................................

Note: No work shall be accepted unless it is accompanied by this submission declaration with all sections completed and it has been signed and dated. Please scan the document and include this to the softcopy of your report.

# Assignment #2 Submission Declaration

**TCP1101 Programming Fundamentals**
**Trimester 2, Session 2020/2021**
*To be Filled by Each Student*

| Name | Angel Phang Ting Ting | | |
|---|---|---|---|
| **ID** | 1201302882 | | |
| **Lecture Section** | TC1V | **Tutorial Section** | TT1V |
| **Names and IDs of students which I have discussed regarding this assignment** | Intan Khairina Adlina bt. Ahmd   1201302263  Cho Xuan Xian   1201302646 | | |
| **Number of hours I spent in doing this assignment** | 168 hours | | |

I hereby declare that this assignment represents the work done by myself. I declare that no part of my work has been copied from other persons or by means of professional assistance.

I hereby declare, and I fully understood that, if I have copied any parts from any other persons OR if any other persons have copied from my work, I will get a mark of ZERO and I am fully responsible to ensure this does not happen.

I also hereby declare that every works or materials/codes that I may have borrowed, copied or modified from other sources are properly acknowledged in the report and the sources are listed in the ACKNOWLEDGEMENT or REFERENCES section. I will take full responsibility and understood that I would get a mark of ZERO if I failed to make proper acknowledgement.

12/3/2021

Signature: …………….................………. Date: ....................................................

Note: No work shall be accepted unless it is accompanied by this submission declaration with all sections completed and it has been signed and dated. Please scan the document and include this to the softcopy of your report.