


<b>Project Case</b>	
<b>C</b>	
<b>Periode Berlaku</b> Semester Ganjil 2021/2022 <b>Valid on</b> Odd Year 2021/2022	<b>Software Laboratory Center</b> <b>Assistant Recruitment 22-1</b>

## Soal

Case

### The Legendary Marksman

One day, your friend comes up with a idea of making a RPG game. Before hiring a game programmer, he need to know how the game would be so he ask you to make the prototype. Because you have practiced the basics of c programming language. Therefore, you are asked to make the console 2D prototype, named The Legendary Marksman.

#### ➤ Main Menu

- This menu contains of 4 menus, which are **New Game**, **Load Game**, **High Score** and **Exit**.
- **Prompt** user to **input chosen menu**. **Validate** the input must **between 1 and 4 inclusively**.

```
The Legendary Marksman
1. New Game
2. Load Game
3. High Score
4. Exit
Choose : █
```

Figure 1. Main Menu

1. If user choose **New Game (Menu 1)**, then:
  - **Prompt** user to **input username**. **Validate** the username must be **between 3 and 20 characters inclusively**.
  - **Validate** the **username** must **not exists**.

```
Welcome...
username : fe
username : felixxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
username : felix
Username already exists
Press Enter to Continue...
```

Figure 2. Username Validation

- **Prompt** user to **input password**. For secure purposes, please **mask the password**.

```
Welcome...
username : bryan
password : *****
Press Enter to Continue...■
```

Figure 3. Input Password

- **Direct** user to **game page**.
2. If user choose **Load Game (Menu 2)**, then:
- **Prompt** user to **input username and password**, please **mask** the password
  - **Validate** username and password must be **correct**
  - **Search** user data by using **Binary Search** from player.txt if the file **exists**.

```
Load Game
input username : bryan
input password : *****
Invalid account
Press Enter to Continue...■
```

Figure 4. Invalid Login

```
Load Game
input username : bryan
input password : *****
Login Success, Welcome bryan
Press Enter to Continue...■
```

Figure 5. Login Success

- If login **success**, **direct** user to **game page**.
- **Game Play**

- Spawn user at the **middle of Home Map**.
- Display **map, user position, and user information**.
- Set user's **score** to 0.
- If user stands the **middle of home map** (fountain), then :
  - ❖ User **health** becomes **full**.
  - ❖ Tell User that he / she can **save** his / her **data** by **typing 'X' key**.
  - ❖ User can **save** his / her **data** by typing **'X' key**. If user data ([Username].txt) **does not exists, create the file**. Then, **save user data to the .txt**.
    - If Username and password **exists** in player.txt, save to the file. If player.txt **does not exist, create the file**. Then **save username and password** to it. Also **sort** the datas by **username ascendingly**.
    - **Saves user score** in highscore.txt, also **sort** the score from the **highest to lowest**. If the highscore.txt **does not exists, create the file**. Then **save** the score to it. You **don't need to save** the score, if the **score is 0** (zero).
- Below is some information of map symbols.

Symbol	meaning
#	Wall
. (In map)	grass
. (In fight scene)	Shooting range
@	Player
W	Weapon Shop
P	Potion Shop
	Portal
E	Enemy
K	Key

Table 1. Map Information

- Prompt user to input **key W A S D** (Case Insensitive) (Up, Left, Down, Right) to **move**.
- Validate that user **cannot pass through walls**.
- If user type key **Q** (Case Insensitive), **leave game without saving his data and score**.
- If user type key **B** (Case Insensitive), display user's **backpack information**.

```
#####
# ..... # W #
# ..... # # # bryan
# ..... # ## ##### level 1
# ..... # # HP 100 / 100
# ..... ##### # XP 0 / 100
# ..... # Money 100
# ..... # Score 0
# # #
# ### ### #
# @ |
# ### ### #
# # # #
# # #
# ..... #
##### ..... #
# # ..... #
# ##### # ..... #
# # # ..... #
# P # ..... #
#####
Press X to save data
```

Figure 6. Home Map

```
# # ..... #
# ##### # ..... #
# # # ..... #
# P # ..... #
#####
Press X to save data
data saved
Press Enter to Continue... █
```

Figure 7. Save

```

bryan's backpack
Weapon
=====
Five Seven -  ammo 20/20  - slot 0

Potion
=====
Small Potion - 2 x
Medium Potion - 3 x
Large Potion - 1 x
Press Enter to Continue...

```

Figure 8. User's Backpack

- Below Is some information about User Weapon

Name	Damage	Range	Price	Ammo Slot	Ammo Price
Five Seven	15	3	50	20	5
S12	60	3	150	15	10
HAMR	30	5	250	40	20
RPG	100	9	350	3	5

Figure 9. Weapon

- Below is some information about Potion

Name	Price	Effect
Small Potion	1	Restores 10% hp
Medium Potion	3	Restores 30% hp
Large Potion	5	Restores 50% hp

Figure 10. Potion

- If user position is **at P** (potion shop), then:
  - ❖ **Direct** user to **potion shop**, display **menus** and **user money**.
  - ❖ **Prompt** user to **input chosen menu**. **Validate** the input must **between 1 and 4 inclusively**.
  - ❖ If user choose **potions** (menu 1 – 3), ask user **how much** he / she wants to buy the potion. **Validate** user can input **0 (to cancel buying) or 1 and more**. Calculate **total price** by **multiplying qty and potion price**. **Validate** user money is **enough to pay** the **total price**.

- If user **money is enough**, **reduce user money by total price and add potions (and the quantity)** to user's data.
  - If money is **not enough**, display **error message**.
  - If **qty is 0**, **cancel buying** potion.
- ❖ If user choose **4**, **exit** from the shop, and **redirect user back to home map**.

```
Potion Shop
Your Money : 1
1. Small Potion ($1)
2. Medium Potion ($3)
3. Large Potion ($5)
4. Exit
Choose : 3
How many do you want to purchase [0 to exit | min 1] ? 5
Your money is not enough
Press Enter to Continue...
```

Figure 11. Money Not Enough

```
Potion Shop
Your Money : 85
1. Small Potion ($1)
2. Medium Potion ($3)
3. Large Potion ($5)
4. Exit
Choose : 3
How many do you want to purchase [0 to exit | min 1] ? 3
Success Purchasing
Press Enter to Continue...
```

Figure 12. Purchase Potion

- If user position is at **W** (Weapon shop), then:
  - ❖ Direct user to **weapon shop**, display **menus and user money**.
  - ❖ **Prompt** user to **input chosen menu**. **Validate** the input must **between 1 and 8 inclusively**.
  - ❖ If user choose **weapon ammo** (menu 1, 3, 5, 6), ask user **how much** he / she wants to buy the ammo. Validate user can input **0 (to cancel buying)** or **1 and more**. Calculate total price by **multiplying qty and ammo price**. Validate user **money is enough to pay the total price**.

- If user **money is enough**, **reduce user money by total price** and **add the ammo slot (and the quantity)** to user's data.
- If money is **not enough**, display **error message**.
- If **qty is 0**, **cancel buying weapon ammo**.
- ❖ If user choose to **buy weapon** (menu 2, 4, 6)
  - If user **has the weapon**, display that user has already have the weapon (**user can't buy the weapon**).
  - If **money is not enough**, display **error message**.
  - If user **money is enough**, **reduce user money by weapon price** and **add weapon** to user's data.
- ❖ If user choose **8**, **exit** from the shop, and **redirect user back to home map**.

```

Weapon Shop
Your Money : 70
1. Five Seven (ammo) ($5)
2. S12 ($150)
3. S12 (ammo) ($10)
4. HAMR ($250)
5. HAMR (ammo) ($20)
6. RPG ($350)
7. RPG (ammo) ($15)
8. Exit
Choose : 1
How many do you want to purchase [0 to exit | min 1] ? 3
Five Seven ammo purchased
Press Enter to Continue...

```

Figure 13. Weapon Shop Purchasing

```
Weapon Shop
Your Money : 55
1. Five Seven (ammo) ($5)
2. S12 ($150)
3. S12 (ammo) ($10)
4. HAMR ($250)
5. HAMR (ammo) ($20)
6. RPG ($350)
7. RPG (ammo) ($15)
8. Exit
Choose : 4
Money Not Enough
Press Enter to Continue...■
```

Figure 14. Money not Enough

```
Weapon Shop
Your Money : 55
1. Five Seven (ammo) ($5)
2. S12 ($150)
3. S12 (ammo) ($10)
4. HAMR ($250)
5. HAMR (ammo) ($20)
6. RPG ($350)
7. RPG (ammo) ($15)
8. Exit
Choose : 2
Weapon already owned
Press Enter to Continue...■
```

Figure 15. Weapon is Already Owned



```

Weapon Shop
Your Money : 55
1. Five Seven (ammo) ($5)
2. S12 ($150)
3. S12 (ammo) ($10)
4. HAMR ($250)
5. HAMR (ammo) ($20)
6. RPG ($350)
7. RPG (ammo) ($15)
8. Exit
Choose : 3
Must have weapon first
Press Enter to Continue...

```

Figure 16. User doesn't have the weapon

- If user enter the 'I' (portal), then:
  - ❖ If current map is home map, direct user to Maze Map (Maze of Astray) at top left position of the map.

```

#####
|@                E K E                #
# ##### # bryan
# # # E # # # #E # level 1
# ##### # # # # # # # # # HP 100 / 100
# # # # # # # # # # # # # # XP 0 / 100
# # # # # # # # # # # # # # Money 55
# # # # # # # # # # # # # # Score 0
# # # # # # # # # # # # # #
# # ##### # # # # # # # # # #
# # # # # # # # #E# # # # #
# # # # # ##### #K# # # # # #E# #
# # # # # # # # # # # # #E # # #
# # # # # # # # # # #K##### #
# # # # # # # # # # # # # #
# # # # # # # # # # # # # #
#E# # # # # ##### # # # # # # #
# # # # # #E # # # # # # # #
#####

```

Figure 17. Maze of Astray





- If user choose **0**, then **back to fight scene**.

```
Choose potion to use
1. Small Potion 0x
2. Medium Potion 0x
3. Large Potion 23x
Choose [0 to cancel]: 1
This potion stock is empty
Press Enter to Continue...
```

Figure 21. Potion Empty

```
Choose potion to use
1. Small Potion 0x
2. Medium Potion 0x
3. Large Potion 22x
Choose [0 to cancel]: 3
You used large potion
Press Enter to Continue...
```

Figure 22. Use Potion

```
Choose potion to use
1. Small Potion 0x
2. Medium Potion 0x
3. Large Potion 0x
You don't have potion left
Press Enter to Continue...
```

Figure 23. No Potion

- ❖ If user **type N M** (Case Insensitive), **change user current weapon (N for right to left) (M for left to right)**. **Validate the weapon must be owned by player**. The Order is Five Seven, S12, HAMR, and RPG.
- ❖ If user **type W, A, S, D** (Case Insensitive) (Top, Left, Down, Right), **user move his / her shooting range according to the way he / she inputted**. **Validate player shooting range must in the fight map and cannot passed through wall**. If we use five seven (3 x 3) range at the bottom right, then we change the weapon into HMR (5 x 5) range, then **move the tip weapon range so it won't passed through walls**.



$$\text{Attack damage} = \text{weapon damage} + 10 \times (\text{level} - 1) \times 2.$$

Equation 1. Attack Damage

- ❖ If the user has **defeated all bandit**, then user will **get XP, money, and score** and then **redirect back user to maze map**.

$$\text{Money \& Score} = 3 \times \text{count bandit in the game}$$

Equation 2. Money And Score After Defeat Bandit

$$\text{XP} = 5 \times \text{count bandit in the game}$$

Equation 3. XP After Defeat Bandit

- ❖ If the user **has taken action 20 times** (W, A, S, D, P, N, M, R, [Space]) the bandit will **attack the user. Reduce user's hp by 10**.
- ❖ If the user **died** (hp <= 0), **set user score to 0** (zero) and then **redirect user back to Home Map** and **set user position into start position**.

```
#####
#7                                     #
#           4                         #  felix
#                                     #  level 51
# 75                                     #  HP 600 / 600
#           8                         #  XP 265 / 600
#                                     #  Money 11519
#           1                         #  Score 0
#                                     #  Current weapon : RPG
#                                     #  Ammo : 0 / 3
#                                     #  Ammo Gauge : 5
#           .....                    #
#           .....                    #
#           .....                    #
# 7           .....                    #
#           .....                    #
#           8 .....                    #
#           .....                    #
#           .....                    #
#           .....                    #
#           6 .....                    #
#           .....                    #
#####
Ammo Empty
Press Enter to Continue...
```

Figure 26. Ammo Empty

```
#####
#7                                     #
#           4                         #  felix
#                                     #  level 51
# 75                                     #  HP 590 / 600
#           8           1             #  XP 265 / 600
#                                     #  Money 11519
#           1                         #  Score 0
#                                     #  Current weapon : RPG
#                                     #  Ammo : 3 / 3
#                                     #  Ammo Gauge : 0
#                                     #
#                                     #
# 7 .....                           #
# .....                             #
# .....                             #
# .....                             #
# .....                             #
# .....                             #
# .....                             #
# .....                             #
#####
Empty gauge
Press Enter to Continue...
```

Figure 27. Empty Gauge

```
#####
#                                     #
#                                     #  felix
#                                     #  level 52
#                                     #  HP 570 / 610
#                                     #  XP 20 / 610
#                                     #  Money 11502
#                                     #  Score 0
#                                     #  Current weapon : Five Seven
#                                     #  Ammo : 10 / 20
#                                     #  Ammo Gauge : 34
#                                     #
#                                     #
#                                     #
# ...                               #
# ...                               #
# ...                               #
#                                     #
#                                     #
#                                     #
#####
bandit defeated
You got 30 money and 50 xp
level up
Press Enter to Continue...
```

Figure 28. Bandit Defeated

```
#####
#                                     #
#                                     # bryan
#                                     # level 1
#                                     # HP 100 / 100
# 1      1  1                       # XP 0 / 100
#                                     # Money 55
#                                     # Score 0
#                                     # Current weapon : Five Seven
#                                     # Ammo : 13 / 20
#                                     # Ammo Gauge : 0
#                                     #
#                                     #
#                                     #
#           2       ...               #
#           ...     ...               #
#       9       ... 3       8         #
#           6                                     #
#           3                                     #
#       1                                     #
#                                     #
#####
You got hit
Press Enter to Continue...
```

Figure 29. User Got Hit

```
#####
#                                     #
#                                     # bryan
#                                     # level 1
#           ...                       # HP 10 / 100
#           ...                       # XP 0 / 100
#           ...                       # Money 55
#                                     # Score 0
#           3       # Current weapon : Five Seven
#           20      # Ammo : 20 / 20
#                                     # Ammo Gauge : 0
#                                     #
#                                     #
#           3       #
#           2  5    #
#                                     #
#                                     #
#                                     #
#####
You got hit
You Died
Press Enter to Continue...
```

Figure 30. User Died

- If user **enters boss portal**, then:
  - ❖ **Direct user to fight boss scene.**
  - ❖ **Import all coordinates from boss\_points.txt and then randomize each coordinate hp from (10 + level) until (30 + level).**
  - ❖ **Apply the same rule as the fight bandit scene** such as move (W, A, S, D), reload (R), shoot ([SPACE]), potion (P), switch weapon (N, M), died.
  - ❖ If the user **has taken action 10 times** (W, A, S, D, P, N, M, R, [Space]) the boss will **attack the user. Reduce user's hp by 20.**
  - ❖ If the user **has defeated all boss parts**, then user will **get XP, money, and score** and then **redirect back user to home map at start position.**



Money & Score = 800 x (1 + level / 10)

Figure 31. Money and Score After Defeat Boss

XP = 500 x (1 + level / 10)

Figure 32. XP After Defeat Boss

Boss Fight  
Kill the boss  
Press Enter to Continue...

Figure 33. Meet Boss

```
#####  
#          879041382          #  
#  44      80222993224      26 #  felix  
# 32626340  3628031368321  19608818 #  level 52  
#  13      362767547464207      44 #  HP 480 / 610  
# 32749682  79701430827578342  99486130 #  XP 150 / 610  
#  92      05271271632811952      80 #  Money 11580  
# 14180865  372617680828735  76420405 #  Score 0  
#  95      6741245174935      93 #  Current weapon : RPG  
# 60276989  66004693371  67000112 #  Ammo : 3 / 3  
#  44      68082      01 #  Ammo Gauge : 10  
# 68184778515048148874859663862471248101 #  
# 93345339820475927930098137430906224871 #  
#  87      12656.....  22 #  
# 18472569  11685..... 54615858 #  
#  93      24389774769360536175881  50 #  
# 14195  45651102812290985403644  07628 #  
#  608      .....717 #  
#  1212580792431  ...2662772788280 #  
#  878      405  ...920...  605 #  
#  16423  18116  ..23151..  33293 #  
#####
```

Figure 34. Boss Fight Scene

```
#####
#                               #
#                               #   felix
#                               #   level 52
#                               #   HP 240 / 610
#                               #   XP 150 / 610
#                               #   Money 11580
#                               #   Score 0
#                               #   Current weapon : RPG
#                               #   Ammo : 2 / 3
#                               #   Ammo Gauge : 5
#                               #
#                               #
#                               #
#                               #
#                               #
#                               #
#                               #
#                               #
#####
Boss Defeated
You got 4800 money and 3000 xp
level up (x9)
Press Enter to Continue...
```

Figure 35. Defeat Boss

3. If user choose **High Score (Menu 3)**, then:
  - Display user **scores**, **sort** from the **highest to the lowest**.

```
High Scores
1. felix - 800
2. felix - 800
3. badut - 90
4. felix - 78
5. erwin - 69
6. badut - 50
7. andre - 10
Press Enter to Continue...
```

4. If user choose **Exit (Menu 4)**, then:
  - **Display** Logo and motto

```

                hhdh
                s  hhhdddmdmdh
                0--:/+0s0  500+++      50-5
                hh 00+::://+++++//:://+0+::oss
                hdddh/:://+++++++oo+/:...//-
                dmdh+////+++++oo+o+o/.` `:oso:.:ddh
                hddh+////+++++oo+/.  ./osooo+::odhdh
                hds+////+++++oo:` ` /ssoooooo+/+sydddh
                sds:////+++++o+` `:osoooooooooo+/+hddd
                s+-:////+++//+o  `+.soooooooooooo+/+sdh
                s+://+//+++++++  `+.s+//////+oooo+++:
                sd//+ooo++//+++o+...+oss:...`~~~~`-/+:::ds
                yo:/+ooo+ooo+++++oo+/+oy-...`~~~~`s+:+.o
                h  +/+ooooooo+++++ooooos...`~~~~` /s+/.-o
                dddo/+oooo++oooo++ooooo-..`~~~~`-+oo+++.d
                dddds//++oooooooooooo+os/.`~~~~`.+:ooo+/+syh
                hddh+//oooooooooooss+.`.:+sssooo++/ohdh
                hh  :/+oooooooss+--/ossssssssoo+:+dddd
                hs::+oooss+/+oossssssoooo+:/hdddh
                /++os0++ooooooooooo+++++++ dhh
                h  so/+++ossoo+///::s
                s/s      hddddddyhdhysss
                +s      hdddh

```

Bluejack 21-1 : Greatness comes from curiosity, tenacity, and integrity

Figure 36. Logo and Motto

### ➤ Miscellaneous & Rules

- Please **don't** make any changes on file **boss\_points.txt**, **home.txt**, **maze.txt** or moving the files out of folder "system".
- Save users data ([user\_name].txt) in folder "users".
- Save **highscore.txt** and **player.txt** in folder "system".
- Save format for **player.txt** is **username#password**.
- Save format for **highscore.txt** is **username#score**.
- Save format for [user].txt is  
 [username]#[level]#[hp]#[mapHP]#[xp]#[maxXp]#[money]  
 [weapon]#[weaponname]\_[isOwned]\_[ammo]\_[slot]  
 [potion]#[name]\_[qty]

Please run the EXE file to see the sample program.