



# 刮住學

## 初中編程體驗比賽

### Scratch 編程工作坊(3)

### Role-Playing Game

### 角色扮演遊戲



宣道會鄭榮之中學

Christian Alliance  
Cheng Wing Gee College

# Turn-based RPG

- In turn-based RPGs, battles consist of turns where a player can command their characters to perform various actions to defeat opponents.



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# A. Game Statistics

1. Turn based RPG battles focus mainly on statistics and formulas.

Variables	Functions
Atk	Physical attack power
Def	Physical defense
MaxHP	Most HP (Health Points) the character can have
HP	Health points, the player is dead when this is at 0



# A. Game Statistics

Variables	Functions
MaxMP	Most MP (Magic Points) a character can have
MP	Magic points, used for magic attacks
MGAtk	Magic attack power
MGDef	Defense from magic attacks
Wep_Atk	A set increase in attack power
Wep_P	A random increase in attack power



# A. Game Statistics

- More variables:

Variables	Functions
dam	Stores the results of the damage calculations
gamestate	1. Wait for player to enter a command 2. Wait for player character animation to finish 3. Allow the enemy to pick an action and carry it out 0. The RPG battle is over
randAtk	A random values of attack
C_Stance	Tells the character sprite which animation to play e.g. standing, attacking, magic.
E_Stance	Tells the enemy sprite which animation to play e.g. standing, attacking, magic.



## B. Stage

2. Add codes in the stage to initialize all variables.

3. Use suffix.

“C\_”: Player

“E\_”: Enemy

```
When flag clicked
set C_Atk to 5
set C_Def to 5
set C_MGAtk to 15
set C_MGDef to 5
set C_MaxMP to 100
set C_MP to C_MaxMP
set C_MaxHP to 100
set C_HP to C_MaxHP
```

```
When flag clicked
set C_Wep_Atk to 5
set C_Wep_P to 5

When flag clicked
set E_Atk to 5
set E_Def to 10
set E_MaxHP to 120
set E_HP to E_MaxHP
set E_MGAtk to 0
set E_MGDef to 0
```



## B. Battle Formula

### 4. Player: Attack → Damage Formula:

設定變數 `dam` 為 `C_Atk` + `C_Wep_Atk` + 在 `0` - `C_Wep_P` 到 `C_Wep_P` 間隨機選一個數 - `E_Def`

### 5. Player: Magic Attack → Damage Formula:

設定變數 `dam` 為 `C_Atk` + `22` - `E_MGDef`



## B. Battle Formula

6. Enemy: Attack → Damage Formula:

設定變數 `dam` 為 `E_Atk - C_Def`

7. Enemy: Magic Attack → Damage Formula:

設定變數 `dam` 為 `E_MGAtk + 0 - C_MGDef`





## C. Broadcasts

Boardcasts	Functions
attack	Makes the player attack
magic	Makes the player character do a magic attack
stance	Tells the player sprite to do an animation
E_attack	Makes the enemy attack
E_magic	Makes the enemy do a magic attack
E_stance	Tells the enemy sprite to do an animation



# C. Broadcasts

- Player Attack

```
當我接收到 attack
設定變數 C_Stance 為 2
設定變數 gamestate 為 2
廣播 stance 並等待

設定變數 dam 為 C_Atk + C_Wep_Atk + 在 0 - C_Wep_P 到 C_Wep_P 間隨機選一個數 - E_Def

如果 dam < 0 就
    設定變數 dam 為 0

將變數 E_HP 改變 -1 * dam
設定變數 E_Stance 為 4
廣播 E_stance 並等待
設定變數 gamestate 為 3
設定變數 C_Stance 為 1
廣播 stance

當我接收到 magic
設定變數 C_Stance 為 3
設定變數 gamestate 為 2
廣播 stance 並等待
設定變數 dam 為 C_Atk + 22 - E_MGDef

如果 dam < 0 就
    設定變數 dam 為 0

將變數 E_HP 改變 -1 * dam
設定變數 E_Stance 為 4
廣播 E_stance 並等待
設定變數 gamestate 為 3
設定變數 C_Stance 為 1
廣播 stance
```

# C. Broadcasts

- Enemy Attack

```
當我接收到 E_attack  
設定變數 E_Stance 為 2  
廣播 E_stance 並等待  
設定變數 dam 為 E_Atk - C_Def  
如果 dam < 0 就  
  設定變數 dam 為 0  
將變數 C_HP 改變 -1 * dam  
設定變數 C_Stance 為 4  
廣播 stance 並等待  
設定變數 E_Stance 為 1  
廣播 E_stance 並等待  
設定變數 gamestate 為 1
```

```
當我接收到 E_Magic  
設定變數 E_Stance 為 3  
廣播 E_stance 並等待  
設定變數 dam 為 E_MGatk + 0 - C_MGDef  
如果 dam < 0 就  
  設定變數 dam 為 0  
將變數 C_HP 改變 -1 * dam  
設定變數 C_Stance 為 4  
廣播 stance 並等待  
設定變數 E_Stance 為 1  
廣播 E_stance 並等待  
設定變數 gamestate 為 1
```



## D. Animations

1. Idle animation
2. Attack animation 1 (player attack)
3. Attack animation 2 (player magic)
4. Attack animation 3 (enemy attack)
5. Attack animation 4 (enemy magic)
6. Hurt animation
7. Death animation



# E. Attack Button

```
當角色被點擊  
如果 gamestate = 1 就  
  廣播 attack
```

```
當 旗幟 被點一下  
重複執行  
  如果 gamestate = 1 就  
    顯示  
  否則  
    隱藏
```



# F. Magic Button

```
當角色被點擊  
如果 gamestate = 1 和 C_MP > 14 就  
  廣播 magic  
  將變數 C_MP 改變 -15
```

```
當 旗幟 被點一下  
重複執行  
  如果 gamestate = 1 就  
    顯示  
  否則  
    隱藏
```



## G. Your Turn

- When “stance” is received...
  - If  $C\_HP < 1 \rightarrow$  Dead



## G. Your Turn

- When “stance” is received...
  - If  $C\_HP > 1 \rightarrow$  Dead
  - Else
    - If  $C\_Stance = 1, \rightarrow$  Idle
    - If  $C\_Stance = 2, \rightarrow$  Attack
    - If  $C\_Stance = 3, \rightarrow$  Magic Attack
    - If  $C\_Stance = 4, \rightarrow$  Hurt

```
否則
  如果 C_Stance = 1 就
    切換造型到 idle
  如果 C_Stance = 2 就
    切換造型到 idle
    移動 100 步
    切換造型到 melee_1
    等待 0.1 秒
    切換造型到 melee_2
    等待 0.1 秒
    切換造型到 melee_3
    等待 0.1 秒
    移到 x: -90 y: -89
    切換造型到 idle
```





## G. Your Turn

- When “stance” is received...
  - If  $C\_HP > 1 \rightarrow$  Dead
  - Else
    - If  $C\_Stance = 1, \rightarrow$  Idle
    - If  $C\_Stance = 2, \rightarrow$  Attack
    - If  $C\_Stance = 3, \rightarrow$  Magic Attack
    - If  $C\_Stance = 4, \rightarrow$  Hurt

```
如果 C_Stance = 3 就  
  切换造型到 idle  
  移动 100 步  
  切换造型到 spell_1  
  等待 1 秒  
  移到 x: -90 y: -89  
  切换造型到 idle
```

The image shows a Scratch code block with a yellow background. It starts with an 'if' block: '如果 C\_Stance = 3 就'. Inside the 'if' block, there are several actions: '切换造型到 idle', '移动 100 步', '切换造型到 spell\_1', '等待 1 秒', '移到 x: -90 y: -89', and '切换造型到 idle'.



## G. Your Turn

- When “stance” is received...
  - If C\_HP > 1 → Dead
  - Else
    - If C\_Stance = 1, → Idle
    - If C\_Stance = 2, → Attack
    - If C\_Stance = 3, → Magic Attack
    - If C\_Stance = 4, → Hurt

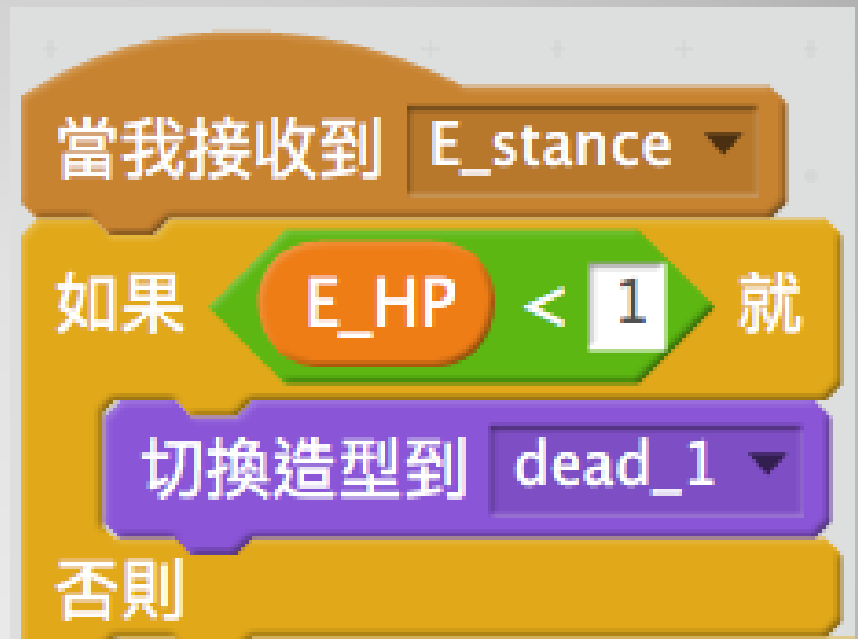


```
如果 C_Stance = 4 就
  說 dam
  切換造型到 hurt_1
  重複 3 次
    移動 -10 步
  重複 3 次
    移動 10 步
  等待 0.5 秒
  切換造型到 idle
  說
```



## H. Enemy Turn

- When “E\_stance” is received...
  - If  $E\_HP < 1 \rightarrow$  Dead



## H. Enemy Turn

- When “E\_stance” is received...
  - If E\_HP > 1 → Dead
  - Else
    - If E\_Stance = 1, → Idle
    - If E\_Stance = 2, → Attack
    - If E\_Stance = 3, → Magic Attack
    - If E\_Stance = 4, → Hurt

```
否則
  如果 E_Stance = 1 就
    切換造型到 idle
  如果 E_Stance = 2 就
    切換造型到 idle
    移動 100 步
    切換造型到 melee_1
    等待 0.1 秒
    切換造型到 melee_2
    等待 0.1 秒
    切換造型到 melee_3
    等待 0.1 秒
    移到 x: 90 y: -89
    切換造型到 idle
```



## H. Enemy Turn

- When “E\_stance” is received...
  - If E\_HP > 1 → Dead
  - Else
    - If E\_Stance = 1, → Idle
    - If E\_Stance = 2, → Attack
    - If E\_Stance = 3, → Magic Attack
    - If E\_Stance = 4, → Hurt



```
如果 E_Stance = 3 就
  切换造型到 idle
  移动 100 步
  切换造型到 spell_1
  等待 1 秒
  移到 x: 90 y: -89
  切换造型到 idle
```



## H. Enemy Turn

- When “E\_stance” is received...
  - If E\_HP > 1 → Dead
  - Else
    - If E\_Stance = 1, → Idle
    - If E\_Stance = 2, → Attack
    - If E\_Stance = 3, → Magic Attack
    - If E\_Stance = 4, → Hurt



```
如果 E_Stance = 4 就
  說 dam
  切换造型到 hurt_1
  重複 3 次
    移動 -10 步
  重複 3 次
    移動 10 步
  等待 0.5 秒
  切换造型到 idle
  說
```



## H. Enemy Turn

- When gamestate = 3 (Enemy turn)...
  - If E\_HP < 1 → Player win



## H. Enemy Turn

- If gamestate = 3 (Enemy turn)...
  - If E\_HP < 1 → Player win
  - If gamestate = 3,
    - randAtk = random 1 or 2
      - If randAtk = 1, E\_attack
      - If randAtk = 2, E\_Magic
      - After enemy attack,
        - If C\_HP < 1 → Dead



```
如果 gamestate = 3 就
  設定變數 randAtk 為 在 1 到 2 間隨機選一個數
  如果 randAtk = 1 就
    廣播 E_attack 並等待
  如果 randAtk = 2 就
    廣播 E_Magic 並等待
  如果 C_HP < 1 就
    廣播 lose_battle 並等待
```





# I. Win & Lose Screen



# Reference

- Turn-Based RPG - Scratch Wiki  
[https://wiki.scratch.mit.edu/wiki/Turn-Based\\_RPG](https://wiki.scratch.mit.edu/wiki/Turn-Based_RPG)
- mrteacherkevin - projects for learning computer science  
<http://mrteacherkevin.com/homepage/scratch/>



# 提交作品

- 請於二零一六年七月六日（星期三）
- 下午五時三十分前提交參賽作品，
- 並電郵至 [syl@cwgc.edu.hk](mailto:syl@cwgc.edu.hk).



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