# Scratch 編程工作坊(3)
## Role-Playing Game
## 角色扮演遊戲

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# 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.

# 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 |

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# 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 |

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# A. Game Statistics

- More variables:

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

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# B. Stage

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

3. Use suffix.

   "**C_**": Player

   "**E_**": Enemy



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

```
When 🏳 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

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# 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

# C. Broadcasts

- Enemy Attack

# 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

# F.    Magic Button



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

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

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# G.    Your Turn

- When "stance" is received…
  - If C_HP < 1 → Dead

# 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

# 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

# G.    Your Turn

- When "stance" is received…
  - If C_HP > 1 → Dead
  - Else
    - If C_Stance = 1, →Idle
    - If C_Stance = 2, →Attack
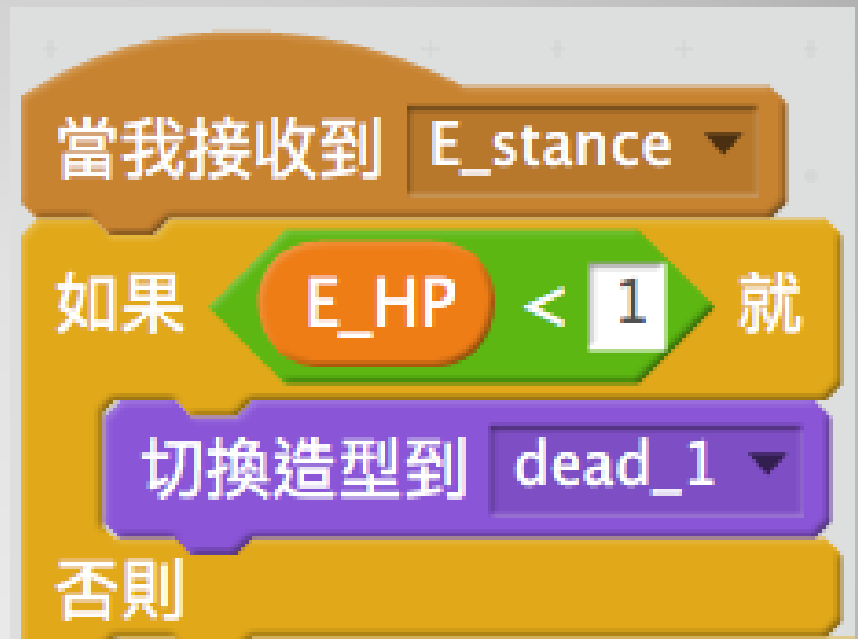    - If C_Stance = 3, →Magic Attack
    - If C_Stance = 4, →Hurt



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# H. Enemy Turn

- When "E_stance" is received…
  - If E_HP < 1 → Dead

當我接收到 E_stance

如果 E_HP < 1 就

切換造型到 dead_1

否則

# 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

# 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



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# 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



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# 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



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# I. Win & Lose Screen

當我接收到 lose_battle ▼
設定變數 gamestate ▼ 為 0
切換背景到 background3 ▼

當我接收到 win_battle ▼
設定變數 gamestate ▼ 為 0
切換背景到 background2 ▼

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# Reference

- Turn-Based RPG - Scratch Wiki https://wiki.scratch.mit.edu/wiki/Turn-Based_RPG

- mrteacherkevin - projects for learning computer science

  http://mrteacherkevin.com/homepage/scratch/

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# 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.

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