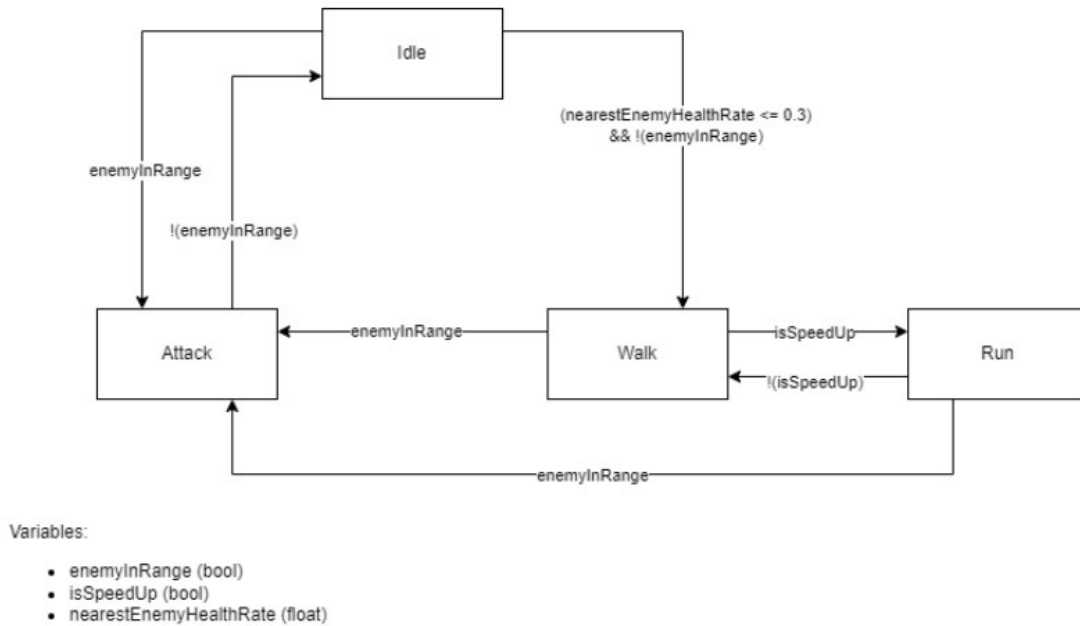


Name: Mai Tien Dat Tran

Student ID: 104207944

TASK 2 – LAB 2 – FSM & PYTHON

The diagram below shows the basic mechanism of a NPC in a RPG game:



The first condition is "Idle."

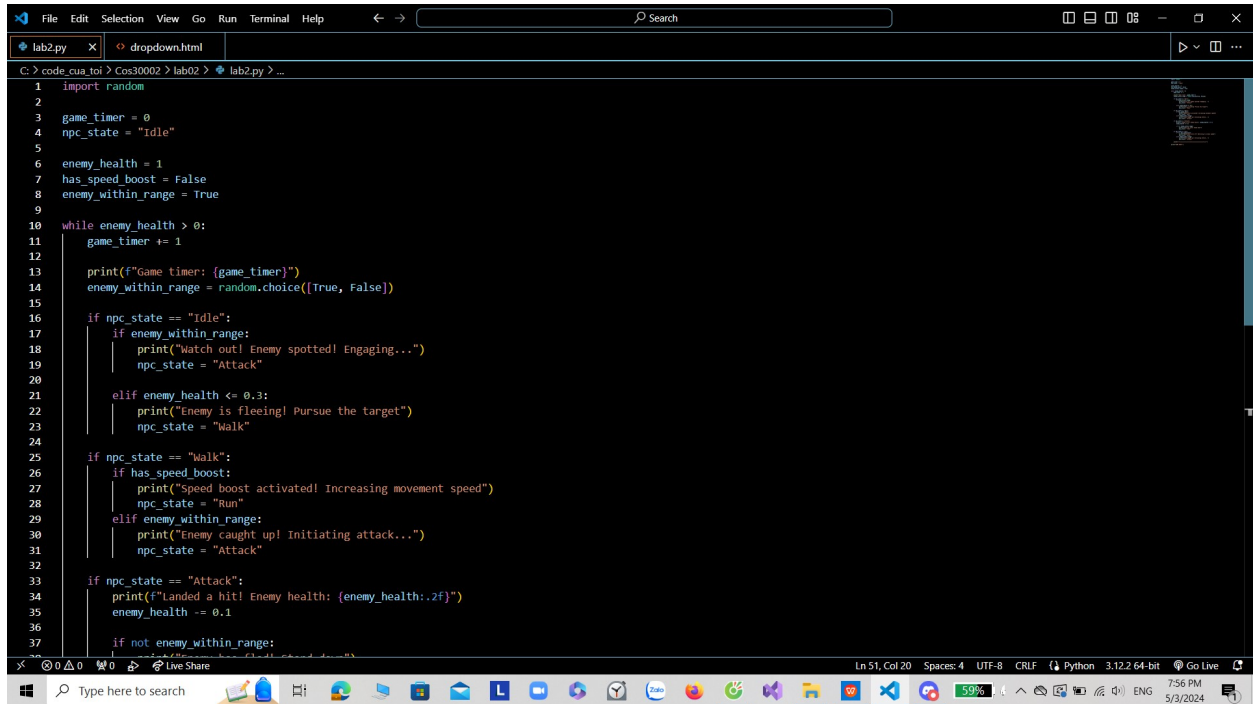
Whenever the opponent enters the NPC's attack range (`enemyInRange == true`), it will transition to the "Attack" state, regardless of its current state.

The NPC will switch from "Attack" to "Idle" when the adversary is outside of its attack range (`enemyInRange != false`).

When the NPC is in the "Idle" state, it will transition to the "Walk" state in order to pursue the nearest enemy whose health percentage is less than or equal to 0.3 (30%) and that adversary is not inside the NPC's range.

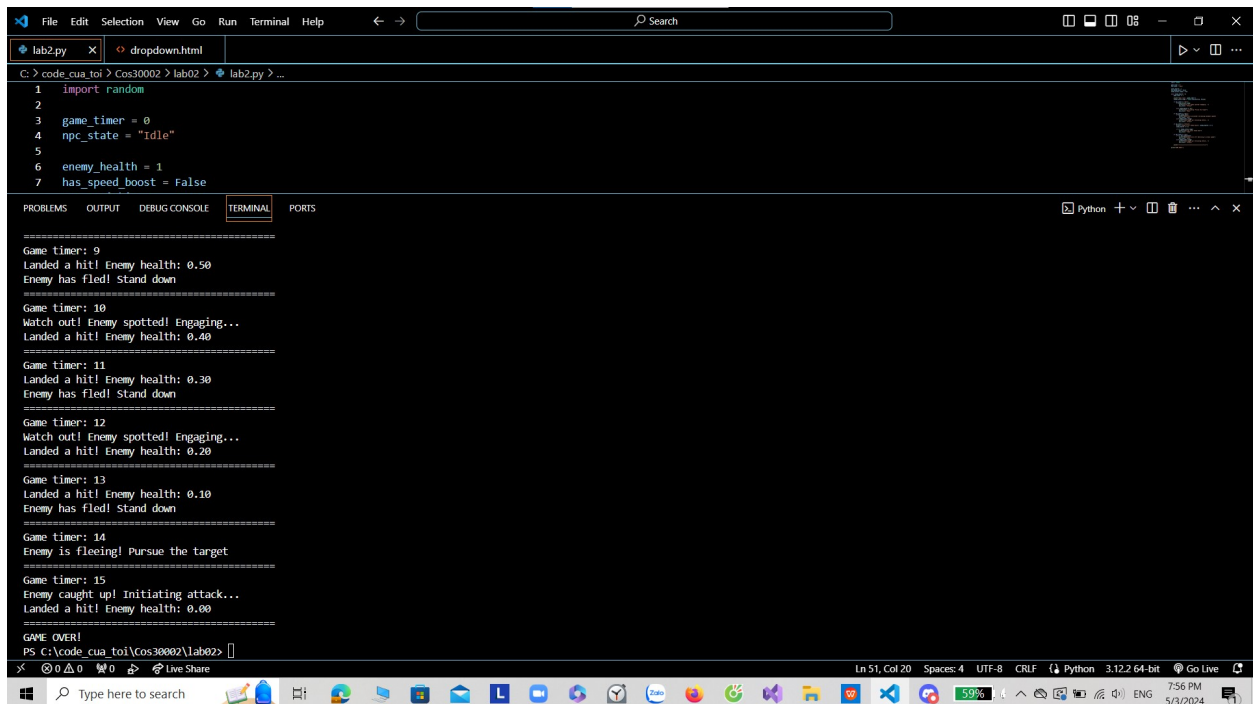
If the NPC has speed-up items (`isSpeedUp == true`), it will transition to the "Run" state while it is pursuing, until those goods run out.

Code:



```
1 import random
2
3 game_timer = 0
4 npc_state = "Idle"
5
6 enemy_health = 1
7 has_speed_boost = False
8 enemy_within_range = True
9
10 while enemy_health > 0:
11     game_timer += 1
12
13     print(f"Game timer: {game_timer}")
14     enemy_within_range = random.choice([True, False])
15
16     if npc_state == "Idle":
17         if enemy_within_range:
18             print("Watch out! Enemy spotted! Engaging...")
19             npc_state = "Attack"
20
21         elif enemy_health <= 0.3:
22             print("Enemy is fleeing! Pursue the target")
23             npc_state = "Walk"
24
25     if npc_state == "Walk":
26         if has_speed_boost:
27             print("Speed boost activated! Increasing movement speed")
28             npc_state = "Run"
29         elif enemy_within_range:
30             print("Enemy caught up! Initiating attack...")
31             npc_state = "Attack"
32
33     if npc_state == "Attack":
34         print(f"Landed a hit! Enemy health: {enemy_health:.2f}")
35         enemy_health -= 0.1
36
37     if not enemy_within_range:
38         print("Enemy has fled! Stand down")
39         enemy_within_range = True
40         npc_state = "Idle"
41         has_speed_boost = False
```

Output:



```
Game timer: 9
Landed a hit! Enemy health: 0.50
Enemy has fled! Stand down

Game timer: 10
Watch out! Enemy spotted! Engaging...
Landed a hit! Enemy health: 0.40

Game timer: 11
Landed a hit! Enemy health: 0.30
Enemy has fled! Stand down

Game timer: 12
Watch out! Enemy spotted! Engaging...
Landed a hit! Enemy health: 0.20

Game timer: 13
Landed a hit! Enemy health: 0.10
Enemy has fled! Stand down

Game timer: 14
Enemy is fleeing! Pursue the target

Game timer: 15
Enemy caught up! Initiating attack...
Landed a hit! Enemy health: 0.00

GAME OVER!
PS c:\code_cua_toi\Cos30002\lab02>
```