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Project 3

About - develop a fantasy combat game using classes and inheritance (polymorphism). This game allows users select characters. And selected characters fight each other. Each character has their own special skills and traits. Game play will be dynamic due to characters' difference

Requirements

- Get users' response and validate it
- Have parent class and inherit its function to derive class
- Special skills need to be activated in certain cases
- Random attack points and defense points
- Check result

Challenges

- How to implement random attack points and defense points for all child class as inherit
- How to implement special skill

How to solve the requirement and challenges

- How to implement random attack points and defense points
 - This two functions should be inherited from base class, so I made it as pure virtual function then override each function
 - Virtual int attack() = 0
 - Virtual int deffence() = 0
 - To implement the random attack points and defense points I used `srand(time(NULL))` as usual for random seed and `rand()` for random number.
- How to implement special skill

- I was able to implement special skills for all characters except harry porter, because program can know whether it should be activated or not only after updating the strength. So I decide to separated function which is sskill()
 - virtual void sskill() = 0; parents class
 - If sub class has special skill
 - Sskill() { do something}

Test Table

1. Game Start – it is to check whether the game is started well and is exited well based on user input

Test Case	Input	Driver Func	Expected Output	Actual Output
Wrong	''	Menu() & getInput()	"your input is wrong...."	Matches expected result
Wrong	'90'	Menu() & getInput()	"your input is wrong...."	Matches expected result
Correct	1	Menu() & getInput()	Return 1, and "Fantasy-combat ..."	Matches expected result
Correct	2	Menu() & getInput()	Return 2, and close the program	Matches expected result

2. select Character – when game started, users have to choose characters for player 1 and 2.

Test Case	Input	Driver Func	Expected Output	Actual Output
Wrong	'0'	Menu() & getInput()	"your input is wrong...."	Matches expected result
Wrong	'c'	Menu() & getInput()	"your input is wrong...."	Matches expected result
Correct	2	Menu() & getInput()	Barbarian selected	Matches expected result

Correct	4	Menu() & getInput()	Medusa selected	Matches expected result
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3. attack() / defenseSK() – It should generate random number for attack points and defense points.

Test Case	Input	Driver Func	Expected Output	Actual Output
	No input	Vampire::attack()	Random number between 1 ~ 6	Result within range
	No input	Bluemen:: attack()	Random number between 2 ~ 20	Result within range
	'No input	Harry::defenseSK()	Random number between 2 ~ 12	Result within range

4. sskill() – Special ability should be invoked under certain condition.

Test Case	Input	Driver Func	Expected Output	Actual Output
Harry potter strength became 0	getStrength == 0 && spAbility == 1	sskill()	Set strength as 20	Matches expected result
Harry potter strength became 0	getStrength == 0 && spAbility == 0	sskill()	Nothing happend	Matches expected result
Medusa glare	Attack() = 12	attack()	return 100 attack points	Matches expected result
vampire charm	Rand() % 2 + 1 == 1	attack()	return 100 defense points	Matches expected result

5. playCheck() – get defender's strength and if it is equal to 0, game completed

Test Case	Input	Driver Func	Expected Output	Actual Output
Game should play round 2	Strength != 0	playCheck()	"round 2"	Match with expected output
Game should play round 3	Strength != 0	playCheck()	"round 3"	Match with expected output
Correct, end game	Strength == 0	playCheck()	"result ... points became 0"	Match with expected output

6. menu(oneMore) – ask users to see that they want to play more game or not

Test Case	Input	Driver Func	Expected Output	Actual Output
Correct	1	Menu() & getInput()	"select a characterfor ..."	Matches expected result
Wrong	2	Menu() & getInput()	"Thank you for playing...."	Matches expected result
Correct	-9	Menu() & getInput()	"Wrong input please..."	Matches expected result
Correct	b	Menu() & getInput()	"Wrong input please..."	Matches expected result

Reflection

This project was not difficult compared to zoo tycoon. This might be because I don't have to utilize the dynamic array which I had to double the array size at runtime. Instead, in this project, I used vector of pointer to class objects, so I could iterate the sub class of parent class. This was explained very well on text book. So, I was able to understand it.

However, it was challenge to deal with special skill, because I had to meet the requirement which was that subclass should not have dependency to external function. So, I implemented special ability within its class. However, as I mentioned above at 'how to solve challenge', I created one more virtual function only for Harry Potter's special ability because I have to check his strength before call the special ability. In order to make it, I tried to override parent class functions because one of instructors pointed me out that doesn't have to be a virtual. However, some reason, it didn't overridden. So I created virtual void function.

