Design:

- each creatures have following attributes:

  name, attack rolls, defense rolls, attack side, defense side, armor value, strength points, attack, defense, name, strength points.

- The creature class include: Barbarian , BlueMen, HarryPotter, Medusa and Vampires.
- Need a test drive to simulate the and calculate the fright result. The test drive will matchup 2 creature and fright for many times and calculate result of win percentage.
- Set up array for p1 and p2 and create a for loop to match each cretures fight each other.
- Because of there are chance element, it should run for many time for each match up and count the win percentage. Let them fight for 1000 times for each match up.
- Each characters have their special:

  Vampire Charm :

  ```
  if (rand() % 2) return 0; else return normal damage take
  ```

  Blue Men Mob: change variable :

  ```
  if (strength<=8) defense_roll=2;

  if (strength<=4) defense_roll=1;
  ```

Medusa Glara:

if (attack_points==12), change attack_points to 99999;

If HarryPotter meet Medusa, and Medusa roll 12, set hogwards = false. And HarryPotter die.

Harry Potter Hogwards:

if ((strength_points<=0)&&(is_hogwards==false)) => set strength_points=20;

is_hogwards=true;

Test plan:

At the beginning, I will print each creater's attack roll point, defense roll point, armor, real take damage and the winner at the end to see they are work right or not.

Each of the creatures will fight against every creatures, and Because of the random element, I will let them repeat fight for a huge amount of time to get the winning ratio rate, eg: if P1 win, it will count for winning and finally divide by total round times.

I will set each creatures fight a big number of time (10000), and count the win/10000 and calculate the ratio of wining.

Result:

The winning ratio is list as following:

P2 / P1	Barbarian	Blue Men	Harry Potter	Medusa	Vampires
Barbarian	54.38%	0.03%	63.66%	70.52%	27.14%
Blue Men	100%	53.62%	99.99%	96.25%	99.52%
Harry Potter	43.79%	0.02%	54.62%	64.28%	21.47%
Medusa	36.41%	6.06%	45.01%	54.73%	17.12%
Vampires	76.72	0.7%	83.73%	87.31%	52.5%

When same creatures versus each other, the P1 have slightly more chance to win every time, maybe because of p1 attack at first and p2 has already lose some strength point. So they have larger chance to die.

During the programing, the virtual function is cost me a lot of time to figure out the error because I am not very familiar with it. The rest of part is considering to design carefully before the coding. And remember to free memory. It's a painful lesson. But every time for writing code should read project carefully and give detail design as much as I can.