**Question1:**

**For the following problems, you are required to design a game that has classes as described below. For each class, you have to decide how to implement it and whether it is an abstract class or a regular class.**

**Note: you can make any logical assumptions.**

**1. Class Animal to represent an animal :**

a. An animal has age and health.

b. Provide the following functions. Then for each function, decide whether it should be abstract or not.

i. Function MakeSound() that makes a different sound for each animal.

Note: you can represent the sound of each animal by a different cout.

ii. Function Eat() that increases the health of the animal.

c. Should this class be an abstract class?

**2. Create a class PeacefulAnimal to represent the type of the animals that may be attacked by aggressive animals:**

a. Provide a function GotAttacked(.....) that decreases the health of the Animal according to the attacker's power.

b. Provide a function Escape() for the peaceful animal to escape from its attacker and return a flag (bool) indicating if it could escape or not.

Assume: this function generates a random value between 0 and 1. If it's less than or equal to 0.5, then the animal couldn't escape.

c. Should this class be an abstract class?

**3. Create a class AggressiveAnimal to represent the type of the animals that can attack PeacefulAnimals:**

a. Each AggressiveAnimal has an AttackPower.
b. Provide a function Attack(.....) for the AggressiveAnimal to attack PeacefulAnimal
    i. What type of parameter(s) should be passed to this function?
    ii. What functions should be called by this function?
    iii. The function should destroy the PeacefulAnimal if its health decreases to zero.
    iv. Each aggressive animal in the game has its own way to attack its prey.
    Should this function be abstract?
c. Should this class be an abstract class?

**4. Use the classes created in the previous three problems to create the classes Lion, Rabbit, Gazelle, Wolf, and Sheep in a main class.**

a. Decide which class to inherit from.
b. Override the functions that should be overridden.
c. Which functions needn't be overridden?

**5. Can we declare a constructor or a destructor as abstract? Why or Why not?**

**Note: you can have more functions than the described above based on your assumptions and understanding.**

## Question2

Given a string s, partition the given string s such that every substring of the partition is a palindrome. Return all possible palindrome partitioning of s.

Example 1:

Input: s = "aab"
Output: [["a","a","b"],["aa","b"]]

Example 2:

Input: s = "a"
Output: [["a"]]

Constraints:

- 1 <= s.length <= 16
- s contains only lowercase English letters.