

1. What is the difference between a class and an object?

Answer: An object is an instant of a class. A class describes the properties of an object which can be instantiated from that class.

Below is an example of a class

```
class Obstacle(pygame.sprite.Sprite):
    """The class that let's us create an Obstacle object"""
    list = pygame.sprite.Group()
    def __init__(self, x, y):
        """initiating the Obstacle class"""
        super(Obstacle, self).__init__()
        self.img = pygame.image.load('pictures/obstacle.png').convert_alpha() #loading the image and converting it
        self.image = self.img
        self.rect = self.image.get_rect()
        self.rect.x = x
        self.rect.y = y
```

And this is an object created based on the class above:

```
Obstacle.list.add(Obstacle(SCREEN_X / 2, SCREEN_Y / 2))
```

2. What is inheritance? What is the Python syntax for inheritance?

Answer: Inheritance is a relationship between classes. Inheritance forms an *is a* relationship. In OOP, one class can inherit attributes and methods from another class.

Below is a picture describing the Python syntax for inheritance.

```
class DerivedClassName(BaseClassName):
    <statement-1>
    .
    .
    .
    <statement-N>
```

3. What is the difference between a has-a and is-a relationship?

Answer: As explained in the previous question, the is-a relationship is formed by inheritance. Is-a relationships exist when objects and classes are related to each other by a class relationship. Has-a relationships are used when objects and classes are related only because they reference one another.

4. What is encapsulation? How is encapsulation handled in Python?

Answer: Encapsulation is the process of hiding the implementation or functional details of an object. Encapsulation refers to the bundling of data with the methods that operate on that data. Python does not really support encapsulation because it does not support data hiding through private and protected members.

5. What is polymorphism? Give examples of polymorphism from the precode and the Mayhem implementation.

Answer: