

WEEK6: Assignment- Python OOP

Q1.Problem on class and object

Task

Write a Person class with an instance variable, age, and a constructor that takes an integer, initialAge, as a parameter.

The constructor must assign initialAge to age after confirming the argument passed as initialAge is not negative; if a negative argument is passed as initialAge, the constructor should set age to 0 and print Age is not valid, setting age to 0.

In addition, you must write the following instance methods:

1. yearPasses() should increase the age instance variable by 1
2. amIOld() should perform the following conditional actions:
 - If age < 13, print You are young..
 - If age > 13 and age < 18, print You are a teenager
 - Otherwise, print You are old..

Input Format

The first line contains an integer, T (the number of test cases), and the T subsequent lines each contain an integer denoting the age of a Person instance.

```
In [9]: class Person:
        def __init__(self, initialAge):
            # Add some more code to run some checks on initialAge
            if (initialAge < 0):
                print("Age is not valid, setting age to 0")
                self.age = 0
            else:
                self.age = initialAge
        def amIOld(self):
            # Do some computations in here and print out the correct statement to the console
            if (self.age < 13):
                print("You are young")
            elif (self.age >= 13 and self.age < 18):
                print("You are a teenager")
            else:
                print("You are old")
```

```

def yearPasses(self):
    # Increment the age of the person in here
    self.age+=1
t = int(input())
for i in range(0, t):
    age = int(input())
    p = Person(age)
    p.amIOld()
    for j in range(0, 3):
        p.yearPasses()
    p.amIOld()
    print("")

```

```

4
-1
Age is not valid,setting age to 0
You are young
You are young

10
You are young
You are a teenager

16
You are a teenager
You are old

18
You are old
You are old

```

Q2.Problem on Inheritance `` Task You are given two classes, Person and Student, where Person is the base class and Student is the derived class. Completed code for Person and a declaration for Student are provided for you in the editor. Observe that Student inherits all the properties of Person. Complete the Student class by writing the following:

- A Student class constructor, which has 4 parameters:

1. A string, firstName.
2. A string, lastName.
3. An integer, id.
4. An integer array (or vector) of test scores, scores.
- A char calculate() method that calculates a Student object's average and returns the grade character

```
In [14]: class Person:
    def __init__(self, firstName, lastName, idNumber):
        self.firstName=firstName
        self.lastName=lastName
        self.idNumber=idNumber
    def printPerson(self):
        print("Name:", self.lastName, self.firstName)
        print("ID:", self.idNumber)

class Student(Person):
    def __init__(self, firstName, lastName, idNumber, testScores):
        super().__init__(firstName, lastName, idNumber)
        self.testScores=testScores
    def calculate(self):
        total = 0
        for testScore in self.testScores:
            total+=testScore
        a=total/len(self.testScores)
        if 90<=a<=100:
            return 'O'
        if 80<=a<90:
            return 'E'
        if 70<=a<80:
            return 'A'
        if 55<=a<70:
            return 'P'
        if 40<=a<55:
            return 'D'
        if a<40:
            return 'T'

line = input().split()
firstName = line[0]
lastName = line[1]
idNum = line[2]
numScores = int(input()) # not needed for Python
scores = list( map(int, input().split()) )
s = Student(firstName, lastName, idNum, scores)
s.printPerson()
print("Grade:", s.calculate())
```

Heralo Memelli 813562
2
100 80
Name: Memelli Heralo
ID: 813562
Grade: 0

In []: