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

1. amlOld() 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 [1]:
```
class Person:
    def __init__(self,initialAge):
        self.age=initialAge
        if (self.age<0):
            print("age is not valid,setting age to zero")
            self.age=0
        else:
            self.age=initialAge
    def amIOld(self):
        if (self.age<13):
            print("you are young")
        elif (self.age>=13 and self.age<18):
            print("you are teenager")
        else:
            print("you are old")

    def yearPasses(self):
        self.age+=1
t = int(input("enter the value"))
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("")
```

```
enter the value4
-1
age is not valid,setting age to zero
you are young
you are young

10
you are young
you are teenager

16
you are 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 representative Of their calculated average

In [ ]:
```
class Person:
        def __init__(self,firstname,idnumber):
            self.firstname=firstname
            self.idnumber=idnumber
        def printPerson(self):
            print("Name:",self.firstname)
            print("ID:",self.idnumber)
class Student(Person):
        def __init__(self,firstname,idnumber):
            super().__init__(self,firstname,idnumber,testscores)
            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<=100:
                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]
idnum = line[2]
numscores = int(input()) # not needed for Python
scores = list( map(int, input().split()) )
s = Student(firstname,idnum, scores)
s.printPerson()
print("Grade:", s.calculate())
```

In [ ]:
```
```