WEEK6: Assignment- Python OOP

In [ ]:
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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.
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In [1]:
```
class Person:
    def __init__(self,initialAge):
        self.age=initialAge
        # Add some more code to run some checks on initialAge
    def amIOld(self):
        if self.age<0:
            print("Age is not valid,setting age to 0.")
            self.age=0
        elif 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.")
        # Do some computations in here and print out the correct statement to the console
    def yearPasses(self):
        self.age+=1
        # Increment the age of the person in here

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("")
```

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4
-1
Age is not valid,setting age to 0.
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.
```

In [ ]:

In [ ]:
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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 [4]:
```
class Person:
    pass

class Student(Person):
    def __init__(self,firstName, lastName, idNum, scores):
        self.firstName=firstName
        self.lastName=lastName
        self.idNum=idNum
        self.scores=sum(scores)/len(scores)
    def calculate(self):
        if self.scores>=90 and self.scores<=100:
            return 'O'
        elif self.scores>=80 and self.scores<90:
            return 'E'
        elif self.scores>=70 and self.scores<80:
            return 'A'
        elif self.scores>=55 and self.scores<70:
            return 'P'
        elif self.scores>=40 and self.scores<55:
            return 'D'
        elif self.scores<40:
            return 'T'
    def printPerson(self):
        print(f"Name: {self.lastName}, {self.firstName}")
        print(f"ID: {self.idNum}")

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())
```

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gayathri, ravi 1997
2
100 50
Name: ravi, gayathri,
ID: 1997
Grade: A
```

In [ ]: