Task 1. Python Programing

Task 1.1

```
n = int(input("Enter a number please "))
numberList = []
for i in range(0,n):
  number = int(input("Please type number no "+str(i+1)+" :"))
  numberList.append(number)
print("Max of list:",max(numberList))
print("Min of list:",min(numberList))
print("Sum of list:",sum(numberList))
numberList.sort(reverse=False)
print("Sorted list:",numberList)
positiveNumbers = filter(lambda x:x>=0,numberList)
negativeNumbers = filter(lambda x:x<0,numberList)
print("Positive numbers:"+str(len(list(positiveNumbers))))
print("Negative numbers:"+str(len(list(negativeNumbers))))
```

```
Enter a number please 3
Please type number no 1 :4
Please type number no 2 :5
Please type number no 3 :6
Max of list: 6
Min of list: 4
Sum of list: 15
Sorted list: [4, 5, 6]
Positive numbers:3
Negative numbers:0
```

Task 1.2

```
def factorial(n):
  result =1
  for i in range(1,n+1):
    result=result*i
  return result
def computeS(n):
  result =0
  while n>0:
    result += factorial(n)
    n=n-1
  return result
computeS(4)
```

```
33
```

Task 1.3

```
class Post():
    """docstring for Post"""
    def __init__(self, content=None,subject=None,likes=0):
        self.__content= content
        self.__subject=subject
        self.__likes=likes
    def getContent(self):
        return self.__content
    def setContent(self,content):
        self.content=content
    def getLikes(self):
        return self.__likes
    def __repr__(self):
        return("Subject: {}| content: {}|| likes: {}\n".format(self.__subject,self.__content,self.__likes))
class Account():
    """docstring for Account"""
    def __init__(self, name,email,country):
        self.__name = name
        self.__email=email
        self.__country=country
        self.__friends=[]
        self.__posts=[]
    def addPost(self,post):
        self.__posts.append(post)
    def addfriends(self,friend):
        self.__friends.append(friend)
    def getFriends(self):
        return self.__friends
    def getCountry(self):
        return self.__country
    def getName(self):
        return self.__name
    def getPosts(self):
        return self.__posts
    def printPost(self):
        postsString = ""
        for post in self.__posts:
            postsString+=str(post)
        return postsString
    def getFriendsListString(self):
        result = "";
        for friend in self.__friends:
            result+=friend.__name+" "
        return result
    def getMaxLikePost(self):
        sortedPosts = sorted(self.__posts,key = lambda post:post.getLikes(),reverse=True)
        return max(self.__posts, key=lambda post:post.getLikes())
    def getMaxLikePostByFriend(self):
        return  max(self.__friends, key = lambda friend:friend.getMaxLikePost().getLikes())
    def __repr__(self):
        return ("name:{}, email:{},country:{}\nposts:\n{}friends:{}\n".format(self.__name,self.__email,self.__country,self.printPost(),self.
class NormalProduct(Account):
    """docstring for NormalProduct"""
    def __init__(self):
        super(NormalProduct, self).__init__()
class NormalProduct(Account):
            """docstring for NormalProduct"""

class VerifiedAccount(Account):
    """docstring for VerifiedAccount"""
    def __init__(self,name,email,country, fromDate):
        super().__init__(name,email,country)
        self.__fromDate = fromDate


class AccountManager():
    """docstring for AccountManager"""
    def __init__(self):
        self.__accounts = []
    def addAccount(self,account):
        self.__accounts.append(account)
    def filterAccounts(self,country):
        filteredCountry = filter(lambda account:account.getCountry()==country, self.__accounts)
        return sorted(filteredCountry,key = lambda account:(-len(account.getPosts()),account.getName()))
    def groupAccountsByPostLike(self):
        result = {}
        result[False]=list(filter(lambda a:len(a.getPosts())<10, self.__accounts))
        result[True]=list(filter(lambda a:len(a.getPosts())>=10, self.__accounts))
        return result
if __name__ == '__main__':
        account1 = NormalProduct("Du Ban Teo","dubanteo2003@gmail.com","Viet Nam")
        account2 = NormalProduct("Du Thanh Minh","duthanhminh2003@gmail.com","USA")
        account3 = NormalProduct("Nguyen Hoang Anh","hoanganh2003@gmail.com","Viet Nam")
        account4 = NormalProduct("Tran Anh Tu","anhtu@gmail.com","Viet Nam")
        account5 = VerifiedAccount("Tran Anh Tai Em","anhtai@gmail.com","Viet Nam",2024)
        post1 = Post("this is my very first post","hello world",10)
        post2 = Post("this is my very second post","what is love?",100)
        post3 = Post("don't ask me about that since I've never known","what is love?",100)
        account1.addPost(post1)
        account1.addPost(post2)
        account2.addPost(post2)
        account3.addPost(post1)
        account3.addPost(post2)
        account3.addPost(post2)
        account3.addPost(post2)
        account3.addPost(post2)
        account3.addPost(post2)
        account3.addPost(post2)
        account3.addPost(post2)
        account1.addfriends(account2)
        account1.addfriends(account3)
        accountManager=AccountManager()
        accountManager.addAccount(account1)
        accountManager.addAccount(account2)
        accountManager.addAccount(account3)
        accountManager.addAccount(account4)
        accountManager.addAccount(account5)

        print(accountManager.groupAccountsByPostLike())
        print(accountManager.filterAccounts("Viet Nam"))
```

```
{False: [name:Du Ban Teo, email:dubanteo2003@gmail.com,country:Viet Nam
posts:
Subject: hello world| content: this is my very first post|| likes: 10
Subject: what is love?| content: this is my very second post|| likes: 100
friends:Du Thanh Minh Nguyen Hoang Anh
, name:Du Thanh Minh, email:duthanhminh2003@gmail.com,country:USA
posts:
Subject: what is love?| content: this is my very second post|| likes: 100
friends:
, name:Nguyen Hoang Anh, email:hoanganh2003@gmail.com,country:Viet Nam
posts:
Subject: hello world| content: this is my very first post|| likes: 10
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
friends:
, name:Tran Anh Tu, email:anhtu@gmail.com,country:Viet Nam
posts:
friends:
, name:Tran Anh Tai Em, email:anhtai@gmail.com,country:Viet Nam
posts:
friends:
], True: []}
[name:Nguyen Hoang Anh, email:hoanganh2003@gmail.com,country:Viet Nam
posts:
Subject: hello world| content: this is my very first post|| likes: 10
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
Subject: what is love?| content: this is my very second post|| likes: 100
friends:
, name:Du Ban Teo, email:dubanteo2003@gmail.com,country:Viet Nam
posts:
Subject: hello world| content: this is my very first post|| likes: 10
Subject: what is love?| content: this is my very second post|| likes: 100
friends:Du Thanh Minh Nguyen Hoang Anh
, name:Tran Anh Tai Em, email:anhtai@gmail.com,country:Viet Nam
posts:
friends:
, name:Tran Anh Tu, email:anhtu@gmail.com,country:Viet Nam
```

```
     posts:
```

Nhấp đúp (hoặc nhấn Enter) để chỉnh sửa

```
account1.getMaxLikePostByFriend()
```

```
     name:Du Thanh Minh, email:duthanhminh2003@gmail.com,country:USA
     posts:
     Subject: what is love?| content: this is my very second post|| likes: 100
     friends:
```

Task 2. NumPy API

Task 2.1

Nhấp đúp (hoặc nhấn Enter) để chỉnh sửa

```
import numpy as np
def createAndFlip():
    arr = np.arange(10,26,1)
    fliptedArr = np.flip(arr)
    return fliptedArr
```

```
createAndFlip()
```

```
     array([25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10])
```

Task 2.2

```
def repeat(arr,times):
    repeatedArr=np.tile(arr,times)
    print(repeatedArr)
    return(repeatedArr)
repeat([1,2,3,4],3)
```

```
     [1 2 3 4 1 2 3 4 1 2 3 4]
     array([1, 2, 3, 4, 1, 2, 3, 4, 1, 2, 3, 4])
```

Task 2.3

```
def replaceAll(arr):
  npArr = np.array(arr)
  mask = npArr > 0.5
  repalcedArr = np.where(mask,0.5,npArr)
  print(repalcedArr)
arr =[[ 0.42, 0.48, 0.32],
  [ 0.74, 0.58, 0.38],
  [ 0.51, 0.34, 0.15 ]]
replaceAll(arr)
```

```
     [[0.42 0.48 0.32]
      [0.5  0.5  0.38]
      [0.5  0.34 0.15]]
```