Python - 7

Total Marks

35.0

Pass Marks

20.0

Marks Obtained

NA

Status

NA

Report

---

Start Time :  18 Dec 2020 09:13

|

End Time :  31 Mar 2023 00:00

Question 1 :

Blood Bank – Donate blood and Save life  
  
Problem statement:  
  
Many of us know the importance of blood availaibility at critical condictions in case of an accident or long run diseases. To keep track of blood donors , blood group wise , an NGO want to go automate the donor identification process with an application with the below requirements  
  
  
Develop a class Donor with the below attributes  
  
ID of numeric type  
Name of string type  
Contact Number of numeric type of 10 digits  
Bloodgroup of String type  
PrevDonatedMon of string type of 3 characters(first 3 characters of the month name) , which represents the month in which the donor donated the blood recently.  
  
AwayFrom of type Numberic representing distance in KM from the centralized point of the city from where the application/program is running.  
  
Note:  
  
Assume that the input month to be recorded for the attribute: PrevDonatedMon ,should fall into the range of Jan to Nov of current year (2020) only.  
  
Implement a \_\_init\_\_ method to initialize the attributes from the main function  
  
Develop BloodBank class with the below attributes  
Name of string type  
ListOfDonors of list of Donor objects  
Implement a \_\_init\_\_ method to initialize the attributes from the main function  
  
Implement a function: getListofAvailableDonors():  
  
Which will return a sorted dictionary of Bloodgroup wise counts in the ascending order of blood group  
  
i.e. BloodGroup and Count as the key:value pairs based on the Donors in the ListOfDonors ,who satisfied with the below two conditions:  
  
The conditions for a Donor, to be considered as available:  
  
1. For any Donor , If there is a minimum of 4 months gap between the 'previously donated month' and current month.  
2. The Donor should be with in 50 kms range(AwayFrom attribute represents this value) from the centralized point of the city from where the application/program is running.  
  
  
Two conditions,above should be satisfied for a Donor to consider as available for donating.  
  
  
The above two conditions section referred multiple places in the Question. To avoid repetitive statements, we mentioned the conditions at one place, i.e. here above and referred the same in couple of places below. Please make a note of it.  
  
  
Note2: Please note that to fulfill the requirement, this function would be called twice, before and after calling the function : getAndUpdateDonor (from main),  
  
to know the status of available donors,bloodgroup wise before and after fulfilling the donors request.  
  
Refer the Sample testcase input for any input or attributes format and output or output format for more clarity.  
  
Implement another function : getAndUpdateDonor() which takes two parameters i.e. blood group and required donor count and return a True or False as per the below requirements:  
  
  
Case1. For the given blood group,  
  
If the required donor count more than the available count of donors( who satisfies the conditions mentioned in the above section: " The conditions for a Donor, to be considered as available") , then the method will update the PrevDonatedMon of all the available Donors of the given blood group with the current month in the list of donor objects (of BloodBank ) and rerutns False  
  
  
Case2. For the given blood group,  
  
If the required donor count is less than or equals to the available count of donors( who satisfies the conditions mentioned in the above section: " The conditions for a Donor, to be considered as available" ), then this method considers the first available donors of the given blood group from the input ListOfDonors (of Bloodbank class) for donation and update the PrevDonatedMon attribute of the donors , considered for donation with current month and returns True.  
  
  
'i.e. If 5 donors are available with the given conditions(mentoned above # a, b), and the required donors are only 3, then the method will consider the first 3 donors as per the input order from the ListOfDonors and update their previous Donated month with the current month  
  
Instructions to write main section of the code  
  
Instructions to write main:  
  
a. You would require to write the main section completely, hence please follow the below instructions for the same.  
b. You would require to write the main program which is inline to the "sample input description section" mentioned below and to read the data in the same sequence.  
c. Create the respective objects( Donor and BloodBank) with the given sequence of arguments to fulfill the \_\_init\_\_ method requirement defined in the respective classes referring to the below instructions.  
  
i. Create a Donor object after reading the data related to it and add the object to the list of Donor objects which will be provided to the BloodBank object. This point repeats for the number of Donor objects(considered in the first line of testcase input) .  
  
ii. Create BloodBank object by passing the BloodBank name(you can hard-code any name you want)and List of Donor objects ( created as mentioned in above point# c.i ) as the arguments.  
  
d. Take a string value for blood group parameter and integer for required donor count, which are to be passed to getAndUpdateDonor function.  
e. Call the method getListofAvailableDonors from the main section and Display the Blood group and "count of donors available for the respective bloodgroup" from the resultant dictionary(returned by the getListofAvailableDonors ) with a single space between them.  
f. Call the method getAndUpdateDonor with the blood group and count of required donors ,read in point#d from the main section.  
h. Display the message "Donor count available" (excluding the quotes) . If the method getAndUpdateDonor returns True and  
  
If False is returned , then display the message ‘Donor count not available' (excluding the quotes).  
  
j. Call the getListofAvailableDonors method again to get the updated available list of donors(satisfies the conditions mentioned for a donor to consider as available)  
k. Display the Blood group and "count of donors available for the respective bloodgroup" from the resultant dictionary(returned by the getListofAvailableDonors )  
  
with a single space between them.  
  
  
Note: Refer testcase input and output for more clarity on input/ouput and their formats.  
  
You can use/refer the below given sample input and output to verify your solution using ' Test against Custom Input ' option in Hackerrank.  
  
  
  
Input Format for Custom Testing  
  
a.The 1st input taken in the main section is the number of Donor objects to be added to the list of donors.  
b.The next set of inputs are the  
  
DonorID  
DonorName  
DonorContactNumber  
DonorBloodgroup  
PrevDonatedMon  
  
AwayFrom  
  
and these input values repeated for number of objects given in the first line of test case input.  
  
c. The last but one and last input of inputs are Bloodgroup and required count of Donors which are to be passed to the getAndUpdateDonor  
  
  
Sample Testcase 1:  
  
Input:  
5  
101  
AAA  
9010101010  
A-Positive  
May  
5  
102  
BBB  
9011101010  
B-Positive  
Jun  
45  
103  
CCC  
9111101010  
O-Positive  
Jul  
49  
104  
DDD  
9111101110  
O-Positive  
Jan  
43  
105  
DDD  
9111101110  
AB-Negative  
Nov  
65  
O-Positive  
2  
Testcase Output:  
  
A-Positive 1  
AB-Negative 0  
B-Positive 1  
O-Positive 2  
Donor count available  
A-Positive 1  
AB-Negative 0  
B-Positive 1  
O-Positive 0  
  
  
Explanation:  
  
a.The first four lines represents blood group wise available count of donors (who satisfies the conditions mentioned in the section: " The conditions for a Donor, to be considered as available" in the Question text ,above)  
  
b. 5th line represents the count of donors required is less than the available count of donors(who satisfies the conditions mentioned in the section: " The conditions for a Donor, to be considered as available" in the Question text ,above)  
  
c. 6th to 9th line represents the updated current available donors count , bloodgroup wise after considering the donors request for "2 in count for O-Positive" .  
  
Hence current O-Positive counts is 0 after donating the O-Positive blood, for 2 in count and remaining bloodgroup donor counts remains intact.