BIRTHDAY PARADOX-FIND YOUR TWIN 03

As you know we collected the birth dates of some fifty people and guess what we don't need three sixty six people to encounter the collision. Actually we encountered a collision in sample of nine people so let us try to simulate this paradox using a program. Before we get into the details of the programme let me give you a brief introduction of the programme for birthday paradox for birthday paradox we will be generating the birth dates randomly I repeat will be generating the birth date randomly and we will not fetch it from the data. We will only generate the birth dates randomly. So now the question arises how can we generate birth dates randomly so birth date will be generated according to the birth month as you know some month comprise of thirty one days and some month comprise of thirty days so we have January march may July august October and December they comprise of thirty one days we have April June September November they comprise of thirty days so birth date will be generating according to the birth months as we are generating only birth date we are not concerned about the birth year. Yes we are not concerned about the birth year we will be only generating the date and the month that's it. So there is an exception here as you know February has twenty eight days or twenty nine days, if the given year is a leap year then the February has twenty nine days else February has twenty eight days. So how can we determine that the given year is a leap here or not? So our question becomes that. For a leap year most of the years that can be divided by four are leap years you know this fact. But there is an exception here also century years century years I mean like five hundred, six hundred, thousand, sixteen hundred, seventeen hundred these are the century years. Century years are not leap years unless they are divided by four hundred, that means if we have seventeen hundred it is divided by four but it is not a leap year. Because this is a century year ok but if we have sixteen hundred it is divided by four hundred ok that means sixteen hundred is a century year as well as leap year. So I repeat most of the years that can be divided by four are leap years but there is an exception here century years are not leap years unless they are divided by four hundred yes unless they are divided by four hundred so now I will show you the pseudo code of how to determine whether the given year is a leap year or not? So we have first of all we will check if the given year is divisible by four hundred then it is definitely a leap year else if it is divisible by hundred then it is not a leap year. I repeat if it is divisible by hundred then it is not a leap year OK, else if the year is divisible by four then it is a leap year and for rest of the cases the given year is not a leap year. So will go through the pseudo code again, first of all you have to check whether the year is divisible by four hundred or not if it is divisible by four hundred then it is a leap year, else if the year is divisible by hundred that means it is not a leap year else if year is divisible by four then it is definitely a leap year else for rest of the cases the given year is not a leap year. So first of all let me try to code this particular function this particular thing of how to determine whether the given year is a leap year or not? So let us do that. So I will just open anaconda spyder and try to

code this. So first of all let me start with how to determine whether the given year is a leap year or not? So I will just generate here randomly or you can also make the user input that particular year, so I will just generate it randomly I hope you know the random library we have already explained it. For example I take the year from ninety three to twenty eighteen ok? As we are using random we should import random here too. Next is we have to write the pseudo code here not the pseudo code the proper code according to the pseudo code. So let us do that I will use if here, so first of all I will say if year percent four is equal to is equal to zero ok and year percent hundred is not equal to zero then I will use or year percent four hundred is equal to is equal to zero, this is according to the pseudo code that I just now explained, I will repeat it again century years the years that divisible by four are leap years but there is an exception here century years are not leap years unless they are divided by four hundred this is the pseudo code that we are using here so after that what I will do is we have generated the year randomly and we will also return the if condition for the year if this conditions satisfies that means you have to print given year is a leap year OK else you have to print given year is not a leap year. So we are done with the programme for leap year so let us try to run it, I will just write leap dot py. Given year is not a leap year so let me try to print the value of year also so that we can get to know whether the given year is a actually leap year or not. Whether our program working fine or not? So let us check that twenty sixteen given year is a leap year? Yes you can see that twenty sixteen is divisible by four and it is also not a century year so it is a leap year let me try to run it again we have twenty eighteen, yes twenty eighteen is not a leap year. Again so let me try to zoom it so that you can also see ok here we have two thousand five is not a leap year again two thousand three it is not a leap year again, twenty sixteen yes this is a leap year again twenty eleven it is not a leap year, two thousand one not a leap year. So this is how we can code the leap year thing so let us move ahead and try to understand the integrities of the programme for birthday paradox. So now that we are done with the leap year code I hope you understood that code so let us move ahead ok, here what we are trying to do here is now we have to write a pseudo code generate the birth dates randomly ok. So as I said different month comprise of different number of days so we have to take care of all the months and we have to generate the days accordingly so we have here if the given month is February and year is a leap year then we have to generate the day randomly from one to twenty nine, if the month is February and the year is leap year then we have to generate the day randomly from one to twenty nine. If the month is February and the year is not the leap year then we have to generate the day randomly from one to twenty eight, yes. We have to generate the day randomly from one to twenty eight then if the month divides by two ok, we have months numbered from one to twelve ok, and if it divides by two that means and the month is less than seven that the month is either april or june ok, then we have to generate the day randomly from one to thirty, january february march april and june ok. So this is it for the month that is less than seven now if the month divides by two and the month is greater than seven, what we are referring here? We are referring here, referring to the month august, october and december then we have to generate the day randomly from one to thirty one ok now if

the month doesn't divide by two and it is less than equal to seven here we are referring to january march may or july these months comprise of thirty one days, yes these months comprise of thirty one days. Now the last condition is left that is if the month doesn't divide by two and the month is greater than seven then we have to generate the day randomly from one to thirty, we are referring september and november here, we are referring september and November here, please note the fact that we are not checking the condition for february, since we have checked it at the first place. Since we have checked the condition for the February at the first place we don't need to check it again. So we will start with February because February is an exception here, we have either twenty eight days or twenty nine days in February. After that we are done with February then we can take into count the months that comprise of either thirty days or thirty one days. So I repeat here first of all you have to check whether the month is february and the given year is a leap year or not ok, if the given year is a leap year then you have to generate the day randomly from one to twenty nine other wise you have to generate the day randomly from one to twenty eight, after that you have to take into count the months that comprise of either thirty days or thirty one days. If the month is divisible by two and it is less than seven then you have to generate the day randomly from one to thirty, if the month is divisible by two and the month is greater than seven then you have to generate the day randomly from one to thirty one, if it is not divisible by two and it is less than equal to seven that means we are also referring july here, you have to generate the day randomly from one to thirty one and the last case if it is not divisible by two and it is greater than seven then you have to generate the day randomly from one to thirty. This is how we are going to proceed in the program, you will get to know more about it when we will write a program about birthday paradox.