Answer on Question #45468,
Programming, Mat LAB | Mathematica | MathCAD | Maple

Problem.

If there is a group of n people in a room, what is the probability that two or more of them having same birthday? It is possible to determine answer to this question by simulation. (Hint: You can generate random dates, n times and determine the fraction of people who born in a given day). Write a function that determines the answer to this question by simulation. The program you write can take n as the input and prints out the probability that two or more of n people will have the same birthday for n=2,3,4…. 40...Flow chart also.

Solution.

Code (MATLAB)

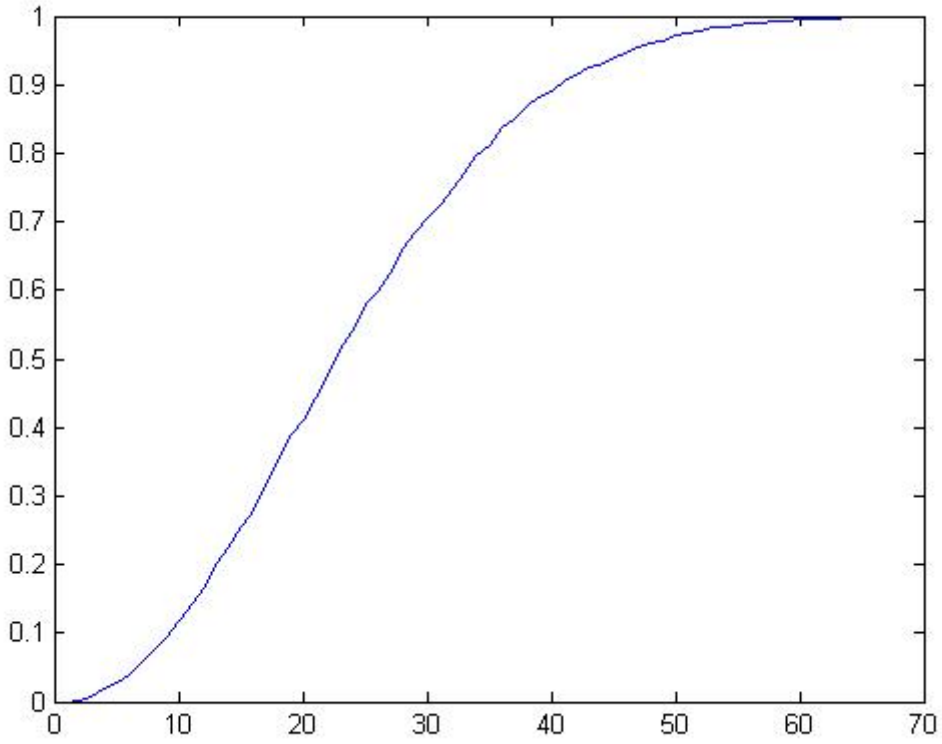
```
function probability()
    clc();

    % Data for graphic
    peopleArray = [];
    probabilityArray = [];

    % Input
    n = input('The maximal number of people: ');
    m = input('The number of simulations: ');

    for i = 1:1:n
        % The number of successful simulations
        % (when there is two or more people with same birthday date)
        simSuc = 0;

        % Simulation loop
        for j = 1:1:m
            simGrp = randi(365, 1, i);
            if length(unique(simGrp)) ~= i
                simSuc = simSuc + 1;
            end
        end
        % Output
        fprintf('The probability equals %f (%d simulations and %d people)\n',
simSuc/m, m, i);

        % Data for graphic
        peopleArray = [peopleArray i];
        probabilityArray = [probabilityArray simSuc/m];
    end

    %Graphic
    plot(peopleArray, probabilityArray)
end
```

Result

Command Window

```
The probability equals 0.317000 (10000 simulations and 17 people)
The probability equals 0.349000 (10000 simulations and 18 people)
The probability equals 0.387400 (10000 simulations and 19 people)
The probability equals 0.410200 (10000 simulations and 20 people)
The probability equals 0.441700 (10000 simulations and 21 people)
The probability equals 0.475600 (10000 simulations and 22 people)
The probability equals 0.512900 (10000 simulations and 23 people)
The probability equals 0.540400 (10000 simulations and 24 people)
The probability equals 0.579600 (10000 simulations and 25 people)
The probability equals 0.597700 (10000 simulations and 26 people)
The probability equals 0.624600 (10000 simulations and 27 people)
The probability equals 0.658500 (10000 simulations and 28 people)
The probability equals 0.683800 (10000 simulations and 29 people)
The probability equals 0.705300 (10000 simulations and 30 people)
The probability equals 0.723000 (10000 simulations and 31 people)
The probability equals 0.747900 (10000 simulations and 32 people)
The probability equals 0.771200 (10000 simulations and 33 people)
The probability equals 0.796400 (10000 simulations and 34 people)
The probability equals 0.810800 (10000 simulations and 35 people)
The probability equals 0.838000 (10000 simulations and 36 people)
The probability equals 0.850600 (10000 simulations and 37 people)
The probability equals 0.867400 (10000 simulations and 38 people)
The probability equals 0.880700 (10000 simulations and 39 people)
The probability equals 0.891800 (10000 simulations and 40 people)
The probability equals 0.906000 (10000 simulations and 41 people)
The probability equals 0.912800 (10000 simulations and 42 people)
The probability equals 0.924800 (10000 simulations and 43 people)
The probability equals 0.928000 (10000 simulations and 44 people)
```

Graphic



Flowchart (http://code2flow.com/abzxt8)