Birthday Problem

We are choosing n people at random and trying to find out probability of collision in their birth date(DD-MM).

Approach

For a particular value of n, we are repeating the trial 1000 times and calculating whether there is a collision in that trial. Finally, the probabillity of collision is calculated as: (no. of trials having collision)/1000.

File "prob.py" gives us probabilities for various number of persons selected
File "plot.py" gives us plot for the data provided by above file
Both files are independent of each other.
We used "Matplotlib" library of python to get the plot of the data
We are attaching image for plot under the name "birthday_ problem.png"

Conclusion

Above problem was related to Birthday Paradox: When a large set S(with cardinality s) is mapped to a small set N(with cardinality n<<s), there will be collisions by pigeonhole principle. If we start choosing t (t<n) elements at random from S, then the probability of finding a collision will grow exponentially with t.

From the analysis of the resulting data, we get that if we choose 23 people at random, then at least 2 of them will have same birth date with probability 0.5 and this probability rises to 0.999 when 70 people are chosen at random which is quite counter-intuitive.

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