Reservoir sampling: for each round of replacement, all elements considered have the same probability of being selected as the sample. ReservoirSample(S[1..n], R[1..k])

*// fill the reservoir array*

**for** i = 1 **to** k

R[i] := S[i]

*// replace elements with gradually decreasing probability*

**for** i = k+1 **to** n

j := random(1, i) *// important: inclusive range*

**if** j <= k

R[j] := S[i]

For N people there are (N-1)! different orders of sitting around the table.

A data point that is distinctly separate from the rest of the data. One definition of outlier is any data point more than 1.5 [interquartile ranges](http://www.mathwords.com/i/interquartile_range.htm) (IQRs) below the [first quartile](http://www.mathwords.com/f/first_quartile.htm) or above the [third quartile](http://www.mathwords.com/t/third_quartile.htm).

The 3rd quartile (Q3) is positioned at .675 SD (std deviation, sigma) for a normal distribution. The IQR (Q3 - Q1) represents 2 x .675 SD = 1.35 SD. The outlier fence is determined by adding Q3 to 1.5 x IQR, i.e., .675 SD + 1.5 x 1.35 SD = 2.7 SD. This level would declare .7% of the measurements to be outliers.

What to do with nonlinear regression effects? Generalized additive models (GAM) or polynomial regression.

Assess fit of logistic regression:

Compare two categorical distributions: chi-sq test

if n coin is given and each have different probability for getting head that is for coin Ai probability is Pi   
find the probability for getting exactly k head

递归。Fun(prob\_list, k)

If k=1: sum(pi\*(1-pj) for j!=i

If k>1: sum(pi\*fun(prob\_list\_without\_pi, k-1))

[1) You sell roses. Each rose cost 30 cents to buy and you can sell them for $10 a dozen.   
a) How many you need to sale to break even if you bought 600 roses?   
b) Tomorrow is holiday - there's 20% likelihood you will sale 600 roses, 50% likelihood of selling 900 roses and 30% likelihood of selling 1200 roses. How many would you buy to maximize profit?](https://www.careercup.com/question?id=5699851013586944)

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