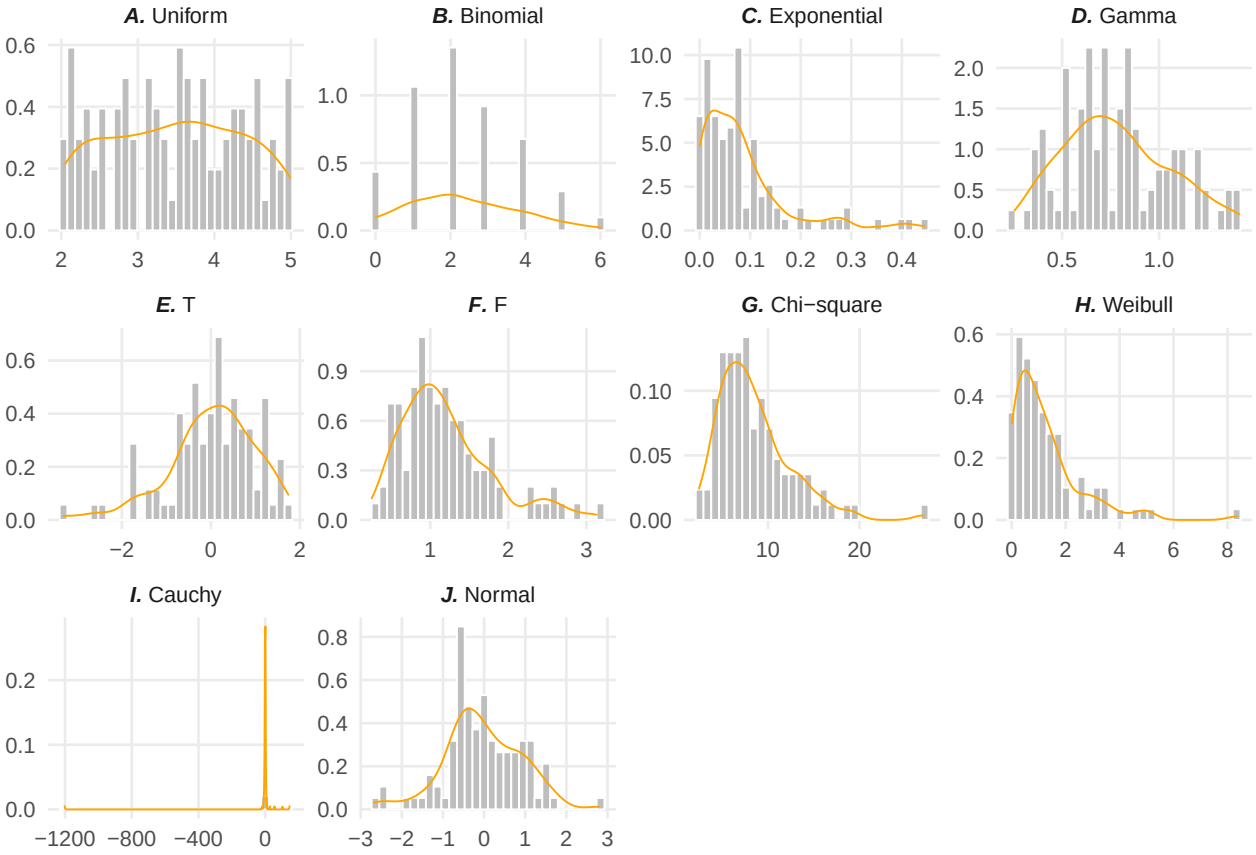
Andrew Moore, 09/26/2021

MATH-471, Homework 3.1

1. Generate samples of n = 100 for 10 different distributions.

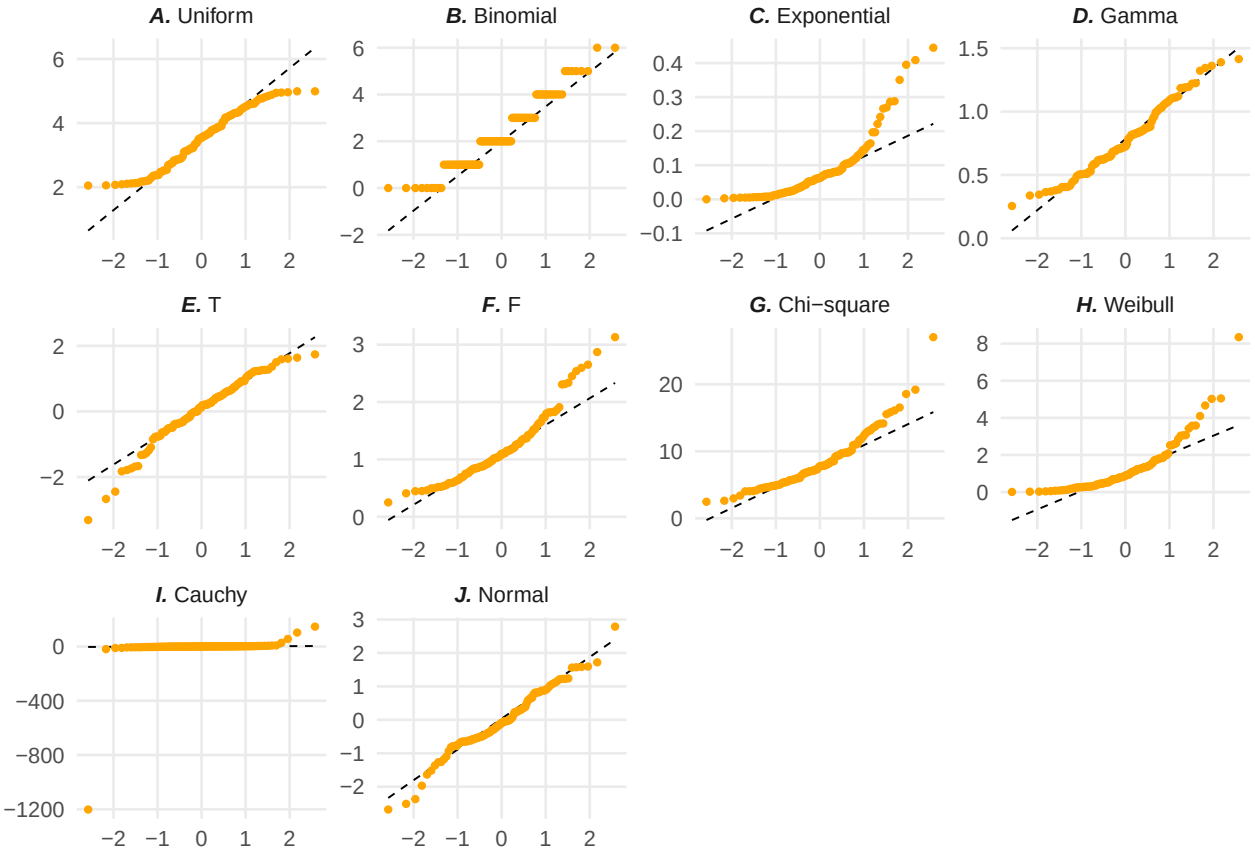
```
# samples from each distribution stored in a list
samples <- list(
  "***A.*** Uniform"     = runif(100, 2, 5),
  "***B.*** Binomial"    = rbinom(100, 25, 0.1),
  "***C.*** Exponential" = rexp(100, 10),
  "***D.*** Gamma"       = rgamma(100, 8, 10),
  "***E.*** T"           = rt(100, 25),
  "***F.*** F"           = rf(100, 15, 15),
  "***G.*** Chi-square"  = rchisq(100, 9),
  "***H.*** Weibull"     = rweibull(100, 1, 1.5),
  "***I.*** Cauchy"      = rcauchy(100, 0, 1),
  "***J.*** Normal"      = rnorm(100, 0, 1)
)
```

2. Create histograms or density plots for each of the 10 distributions, and describe their shapes.



- **A.** The shape is generally flat across the range. It is difficult to discern a natural center among the data values.
- **B.** The data look discrete, and the shape is triangular, with a peak at 2.
- **C.** The distribution is positively skewed, with a sharp drop-off of data values starting close to 0.1.
- **D.** The shape appears roughly symmetric, centered at roughly 0.75.
- **E.** The shape appears roughly symmetric, centered at 0, with a slight negative skew.
- **F.** The shape is mound-like, centered at 1, with a positive skew.
- **G.** There is moderate positive skew exhibited in the data; there appear to be very few outliers. It is similar in shape to **F.**
- **H.** The data are positively skewed, with a sharp drop-off of values starting at 2. It is similar in shape to plot **C.**
- **I.** The data seem to be centered at 0, but there is an extreme negative outlier within the sample.
- **J.** The shape is mound-like, symmetric, and centered at 0. It is similar in shape to plot **E.**

3. Use QQ-plots to determine if the sample comes from a *normal* distribution.



- **A.**
- **B.**
- **C.**
- **D.**
- **E.**
- **F.**
- **G.**
- **H.**
- **I.**
- **J.**