TI-83 Help **L. Liu**

How to use TI-83 or 84 or plus to find probability? Use DISTR (distribution).

1. Normal distribution:

   (a) $P(a < X < b) = DISTR \rightarrow normalcdf(a, b, \mu, \sigma)$

   Ex: X satisfies Normal with mean $\mu = 100$ and standard deviation $\sigma = 20$. Find $P(80 < X < 140)$.

   Do $DISTR \rightarrow normalcdf(80, 140, 100, 20)$ enter to get 0.8186

   (b) For standard normal N(0,1): $P(a < Z < b) = DISTR \rightarrow normalcdf(a, b)$

   Ex: Z satisfies Standard Normal with mean $\mu = 0$ and standard deviation $\sigma = 1$. Find $P(-1 < Z < 2)$.

   Do $DISTR \rightarrow normalcdf(-1, 2)$ enter to get 0.8186

   (c) If given $P(X < x) = p$, to find x: $DISTR \rightarrow invnorm(p, \mu, \sigma)$

   Ex: X satisfies Normal with mean $\mu = 100$ and standard deviation $\sigma = 20$. Find $P(X < x) = 0.9876$.

   $DISTR \rightarrow invnorm(0.9876, 100, 20)$ to get $x = 144.89$

   (d) For standard normal N(0,1): Given $P(Z < z) = p$, z is $DISTR \rightarrow invnorm(p)$

   Ex: Z satisfies Standard Normal N(0,1). To find z so that $P(Z < z) = 0.55$

   $DISTR \rightarrow invnorm(0.55)$ to get $z = 0.1257$

2. Binomial distribution B(n,p): $DISTR \rightarrow binomcdf(n, p, \{k_1, k_2\})$ gives $P(k_1 < X \leq k_2)$.

   In particular, $DISTR \rightarrow binomcdf(n, p, k)$ gives $P(0 \leq X \leq k)$

   Toss a coin $n = 10$ times, the probability of head on each toss is $p = 1/3$. X is the number of heads out of 10 tosses. Then $P(2 \leq X \leq 6) = P(X = 0, 1, 2, ..., 6) - P(X = 0, 1)$

   Punch $DISTR \rightarrow binomcdf(10, 1/3, \{1, 6\})$, to get 0.1040, 0.9803. Then

   $P(2 \leq X \leq 6) = P(X = 0, 1, 2, ..., 6) - P(X = 0, 1) = 0.9803 - 0.1040$

3. Poisson distribution with mean μ:

   $DISTR \rightarrow Poissoncdf(\mu, x)$ gives $P(0 \leq X \leq x)$

4. t-Distribution with degree of freedom df:

   $DISTR \rightarrow tcdf(lower, upper, df)$ returns the probability between lower and upper.

   Ex: X has t-Distribution with degree of freedom 18 :$P(-2 < X < 3)$ is $DISTR \rightarrow tcdf(-2, 3, 18)$

5. χ^2 distribution with mean df: $DISTR \rightarrow \chi^2cdf(lower, upper, df)$ returns the probability between lower and upper. Ex: X has χ^2-Distribution with degree of freedom 18 :$P(2 < X < 13)$ is $DISTR \rightarrow \chi^2cdf(2, 13, 18)$, which is 0.2084

6. F-distribution: $Fcdf(lower, upper, numeratordf, denominatordf)$ returns the probability between lower and upper.

   Ex: If X has F-distribution with numerator df 24, denominator df 19, then $P(0 < X < 2)$ is $Fcdf(0, 2, 24, 19)$, which is 0.9364

7. Geometric distribution: X= number of Tosses of a coin until 1st head, with prob(H)=p

   $P(X \leq x)$ is $geometcdf(p, x)$