1.

\>> mu = 78.3; sigma = 7.6; n = 12;

\>> t = **tinv(0.975,n-1)** = 2.2010

\>> SEM = sigma/sqrt(n) = 2.1939

\>> mu-t*SEM = 73.4712 【CI lower bound】

\>> mu+t*SEM = 83.1288 【CI upper bound】

2.

\>> mu = 57.6; sigma = 9.8;

(a) >> **normcdf(50,mu,sigma)** = 0.2190

(b) >> **1-normcdf(70,mu,sigma)** = 0.1029

(c) >> **norminv(0.1,mu,sigma)** = 45.0408 【underweight】

\>> **norminv(0.9,mu,sigma)** = 70.1592 【overweight】

3.

\>> lambda=0.75;

(a) >> **poisspdf(0,lambda)** = 0.4724

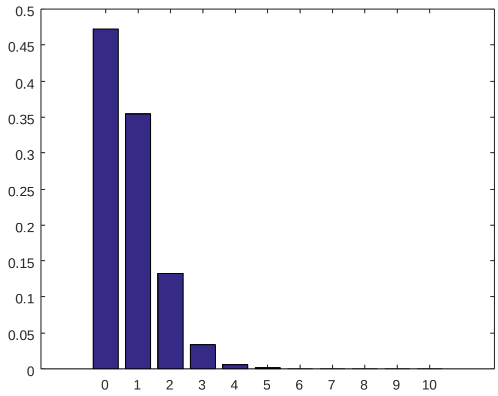
(b) >> **1-poisscdf(1,lambda)** = 0.1734

(c) >> **1-poisscdf(4,lambda)** = 0.0011

(d) >> x = [0:10];

\>> y = **poisspdf(x,lambda)**;

\>> bar(x,y)



4. (a) >> **1-tcdf(2.015,5)** = 0.0500

(b) >> **tcdf(-2.365,5)** = 0.0322

(c) >> **1-2*tcdf(-3.032,5)** = 0.9710

(d) >> **tinv(0.975,5)** = 2.5706

5. (a) x=[131, 119, 138, 125, 129, 126, 131, 132, 126, 128, 128, 131];
>> mu = mean(x) = 128.6667
>> S = std(x) = 4.6384

(b) Since n = 12, the degree of freedom is 11.
Lower bound of the 95% CI based on t-distribution is:
mu + **tinv(0.025, 11)***S/sqrt(12) = 125.7195.
The upper bound is:
mu + **tinv(0.975, 11)***S/sqrt(12) = 131.6138.

(c) y = [136, 130, 126, 126, 139, 141, 137, 138, 133, 131, 134, 129]
mean(y) = 133.3333.
Note that this mean value of male bears is outside of the upper bound of 95% CI of female bears. This suggests that male skulls are not having a comparable size as the female skulls. In fact, the male head size is bigger.

(d) >> t=(133.3333-mu)/(S/sqrt(12)) = 3.4852.
This is to the very right of the tail, suggesting that the male size is drifting away from the female statistics.

(e) >> 1-tcdf(t,11) = 0.0026.
Remember we are testing whether the two sizes are the same. In other words, this is a 2-tailed test, which would give a p-value twice the amount of 0.0026, which is **0.0052**. Still this is smaller than 0.05, suggesting a rejection of the null hypothesis. That is, the head size differs significantly.

(f) mu + **tinv(0.975, 11)***S/sqrt(12) = 131.6138.
This is the limit that male size will not be considered significantly away from the female statistics. 【Same as found in part (b)】