**Pseudo Random Numbers (2-08)**

To start with, there is no such thing as a pure random number with computers because everything is algorithmic.  Instead, you create a very complex algorithm to produce "random" numbers, also called a pseudo-random number.  For most applications that require random numbers, the pseudo-random number is good enough.

The algorithm takes a number as input, executes a very complex formula on the number, and returns another number.  The returned number then becomes the input for the next random number, and that returned number the input for the next.

The seed number is the number used the first time the algorithm executes.  When you use the same seed number, you guarantee all "random" numbers afterwards will be the same.

Now, there is still one more step to turn the pseudo-random number into a number you asked for. For instance, when you execute this:

***rnorm(n=20, mean=12, sd=3);***

You are reasonably expecting numbers between 2 and 22.  But the pseudo-random generator does not generate numbers between 2 and 22.  It creates numbers with huge astronomical values.  Those numbers need to be normalized for the above ***rnorm()***.  How this is done is still something that is beyond me -- although I have naive ideas on how it works.