**LECTURE #18**

Aim: To understand the difference between (a) a **random process**, which has a finite definition but can “run" for ever, and (b) a single trajectory or run of the process.

Very simple definition of a random process:

// Program to simulate throwing a fair die **forever**

float r;

int val;

main() {

while (1) do {

r = rand(); // Assume same as in Excel

val = floor(6\*r) + 1;

printf( “%3d \n", val );

}

}

See the Excel sheet for a simulation of this random process.

This process is a “stateless" process, since its value at time n+1 does not depend on any of its previous values.

The running sum of all successive values thrown by the die would be a Markov process, since the sum at time n+1 depends only on the sum at time n.

The “moving average” over the most recent N > 2 values is not a Markov process, because the (n+1)st value depends on the previous N-1 values.

[Note: If N = 2, the moving average *is* a Markov process.]