Limiting Values

R = 0   C > 0   P = 1

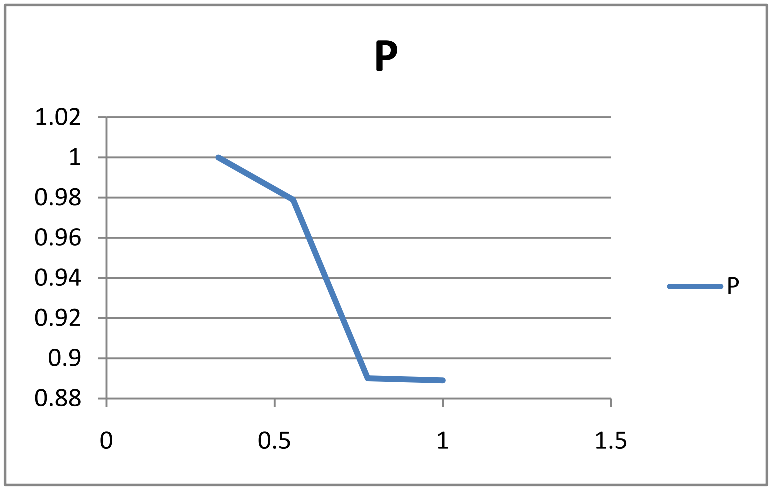
R = 1   C > 1   P = 1

N = Size of Grid x Size of Grid

F = Fraction of the grid filled

For 3 x 3

R	C	F	P
1	2	0.333	1
2	3	0.555	0.979
3	4	0.777	0.89
4	5	1	0.889



Inconsistency

There is an inconsistency in the graph because the game is played at too equal level, like if we play the game of chess and randomly place the piece and start the game we cannot certainly say which side will win.

Previously in Cops and Robber, the robbers cannot kill the cops so the probability of catching the robber was 1 with 2 cops.

Impossible States

	R	R	R	
		R	R	R
		C	**R**	R
		C	C	R

		R	R	
	C	R	R	
	C	**R**	R	
	C	R	R	
		R	R	

In both of the above cases the robber's configuration is completely safe and protective; **R** (shown in bold and big) is completely surrounded and has six robbers surrounding it including itself. In both the cases the configuration cannot be broken due to similar powers in cops and robbers.

The Idea of CLUSTERING

If we say that the cops are clustered like for each cops position there is more than one cop.

So, if K_c = number of cops in each place of C.

Number of Cops = K_c x C

In the above cases if we consider for each cop place there are 2 cops, then the number of cops surrounding **R** will be 2 x 3 = 6 which will be equal to the number of robbers, and still it's not good to force the robbers to break their configuration.

But if for each cops place there are 3 cops then the number of cops surrounding **R** will be 3 x 3 = 6 which will be more than number of robbers. And will break their configuration.

The value of K_c ranges from 3 to 9.

		R	R	
	CCC	R	R	
	CCC	**R**	R	
	CCC	R	R	
		R	R	

We can test for

Number of Cops required for catching r Robbers using a particular/variable K_c.