**Ozkan Emre Ozdemir – Assignment #2– Methods for Data Analysis – 4/14/2016**

**SIMULATION # 1: WINNING**

In this first simulation the winning probabilities and variances are calculated when the door is switched or not.

**Condition 1 Door is switched:** Based on 1000 number of plays the probability of winning when the door is switched and the variances are calculated as:

Probability of winning\* = 0.683

Variance\* = 0.2167277

**Condition 2 Door is not switched:** Based on 1000 number of plays the probability of winning when the door is not switched and the variances are calculated as:

Probability of winning\* = 0.36

Variance\* = 0.2306306

\*These values may change slightly every time the simulations is run since the sample of selected door and winning door will change in every simulation

**SIMULATION # 2: LOSING**

In this second simulation the losing probabilities and variances are calculated when the door is switched or not.

**Condition 1 Door is switched:** Based on 1000 number of plays the probability of losing when the door is switched and the variances are obtained as:

Probability of losing\* = 0.319

Variance\* = 0.2174565

**Condition 2 Door is not switched:** Based on 1000 number of plays the probability of losing when the door is not switched and the variances are obtained as:

Probability of losing\* = 0.694

Variance\* = 0.2125766

\*These values may change slightly every time the simulations is run since the sample of selected door and winning door will change in every simulation

In order to have a better understanding how the number of play affect the probability of winning, the following plots are generated for both switching and not switching the door conditions. As it can be seen from the plots, when the door is switched the probability of winning converges to 2/3 as the number of play increases while it meets to 1/3 when the players stick with their door.



