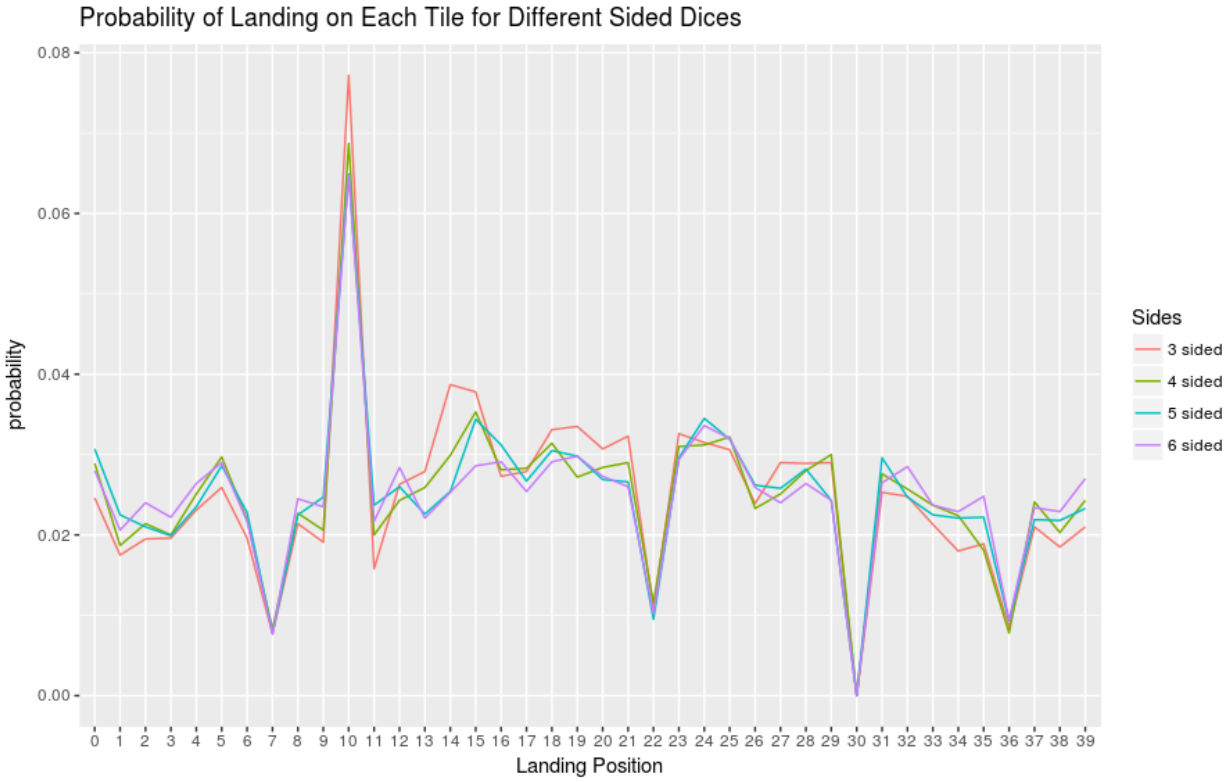
HW#3

PART I:

1. See attached code for detail.
2. The three most likely squares to end a turn on if using a 6-sided dice are 10, 24, 15. The Three most likely squares to end a turn on if using a 4-sided dice are 10, 15, 16.
   The following graph shows the long-term probabilities of landing on each square for 3, 4, 5, 6 sided-dices. We can see that the probability of landing on jail is the largest.



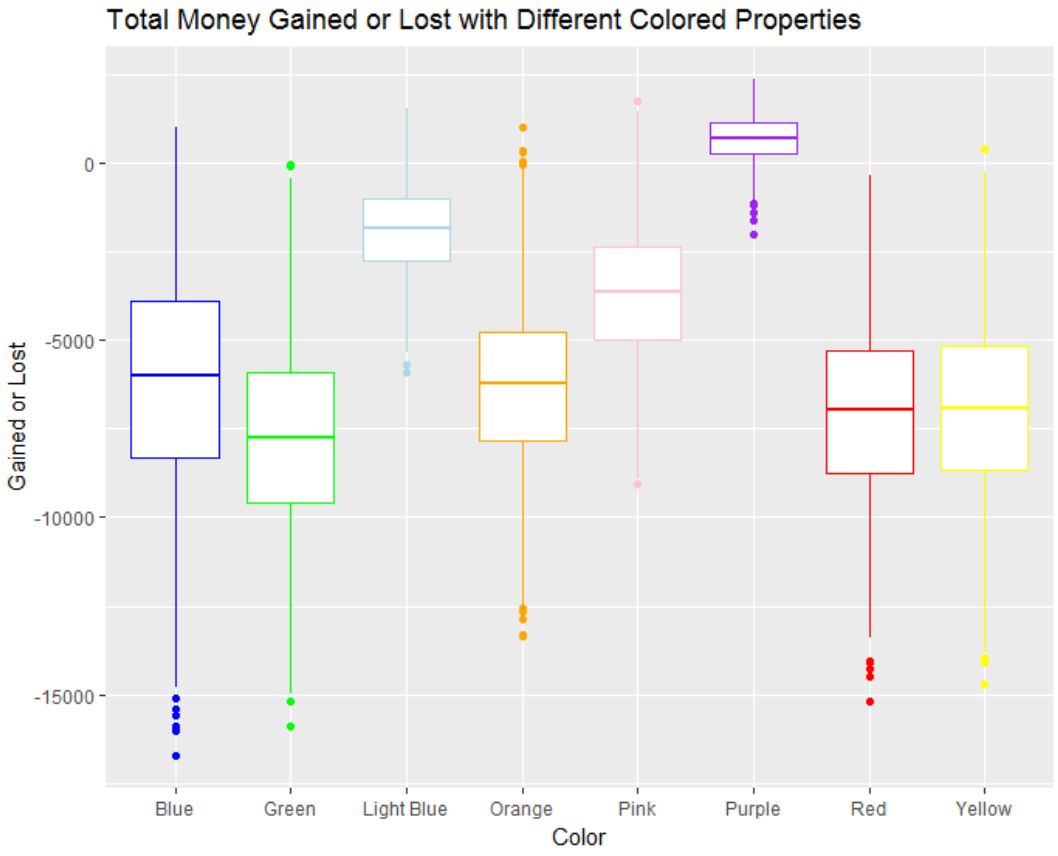
3. The standard error of the probability landing on jail is 0.01944227. See attach code for detail.

PART II:

1. See attached code for detail.

2.

From the following graph, we can see that the blue property has the widest range and it has the observation that costs the player to lose most of money. However, we can see that the boxplot for the green property are below all other boxplots. It means that the green property costs the player more money most of times. Therefore, the green property is most effective. On the other hand, the purple property is least effective.



3.

Simulation Result with n=25				
	color	win	lost	win %
1	Purple	65	635	9.30%
2	Light Blue	235	465	33.60%
3	Pink	327	373	46.70%
4	Orange	423	277	60.40%
5	Red	498	202	71.10%
6	Yellow	468	232	66.90%
7	Green	446	254	63.70%
8	Blue	338	362	48.30%

Simulation Result with n=50				
	color	win	lost	win %
1	Purple	26	674	3.70%
2	Light Blue	190	510	27.10%
3	Pink	305	395	43.60%
4	Orange	441	259	63.00%
5	Red	502	198	71.70%
6	Yellow	511	189	73.00%
7	Green	460	240	65.70%
8	Blue	365	335	52.10%

Simulation Result with n=100				
	color	win	lost	win %
1	Purple	2	698	0.30%
2	Light Blue	137	563	19.60%
3	Pink	256	444	36.60%
4	Orange	431	269	61.60%
5	Red	489	211	69.90%
6	Yellow	502	198	71.70%
7	Green	531	169	75.90%
8	Blue	452	248	64.60%

From the tables above, we can see that as the n goes larger, the probability of purple to win decreases. Overall, the green color has largest probability to win.