Single rolls bets involve betting on the next roll of the dice only. The following table lists single roll bets.

Bet	Probability	Odds	Payout	Expected Value
2 (snake eyes) or 12 (boxcar)	$\frac{1}{36}$	35:1	30:1	$\frac{1}{36}(30) + \frac{35}{36}(-1)$ $= -0.14$
3 or 11 (yo-leven)	$\frac{2}{36}$	34:2	15:1	$\frac{2}{36}(15) + \frac{34}{36}(-1)$ $= -.11$
Hi-Lo (2 or 12)	$\frac{2}{36}$	34:2	15:1	$\frac{2}{36}(15) + \frac{34}{36}(-1)$ $=-.11$
Craps (2,3,or 12)	$\frac{4}{36}$	32:4	7:1	$\frac{4}{36}(7) + \frac{32}{36}(-1)$ $=-.11$
C and E (bet 1/2 on craps,1/2 on yo)	$\frac{6}{36}$	30:6	3:1 on craps, 7:1 on 11	$=\frac{4}{36}(3) + \frac{2}{36}(7) + \frac{30}{36}(-1)$ $=-.11$
Horn (2,3,11,12)	$\frac{6}{36}$	30:6	27:4 on 2,12, 3:1 on 3,11	$\frac{2}{36}(\frac{27}{4}) + \frac{4}{36}(3) + \frac{30}{36}(-1)$ $= -.13$
Any seven	$\frac{6}{36}$	30:6	4:1	$\frac{6}{36}(4) + \frac{30}{36}(-1)$ $=-.17$
Field (2,3,4,9,10,11,12)	$\frac{16}{36}$	20:16	1:1 on 3,4,9,10,11, 2:1 on 2,12	$\frac{14}{36}(1) + \frac{2}{36}(2) + \frac{20}{36}(-1)$ $= -.06$

Multiroll bets are played out over several rolls of the dice.

Place bets: bet that a given sum will be rolled before a sum of seven is rolled.

Hardway bets: bet that you will roll doubles of a given sum before you will roll a seven or you roll the sum the "easy way", i.e., not doubles.

Bet	Probability	Odds	Payout	Expected Value
Place 4/10	$\frac{3}{3+6}$	6:3	9:5	$\frac{3}{9}(\frac{9}{5}) + \frac{6}{9}(-1)$ $= -.07$
Place 5/9	$\frac{4}{4+6}$	6:4	7:5	$\frac{4}{10}(\frac{7}{5}) + \frac{6}{10}(-1)$ $= -.04$
Place 6/8	$\frac{5}{5+6}$	6:5	7:6	$\frac{5}{11}(\frac{7}{6}) + \frac{6}{11}(-1)$ $= -.02$
Hardway 4/10	$\frac{1}{3+6}$	8:1	7:1	$\frac{1}{9}(7) + \frac{8}{9}(-1)$ $= -.11$
Hardway 6/8	$\frac{1}{5+6}$	10:1	9:1	$\frac{1}{11}(9) + \frac{10}{11}(-1)$ $= -.09$
Pass/Come	$\frac{244}{495}$	251:244	1:1	$-.01$
Don't Pass/Don't Come	$\frac{949}{1980}$	976:949	1:1	$-.01$

Craps Project Name:

1. *Neatly* fill in the following table.

Type of Bet	Money on bet	Payout	Expected Value	Win?	Actual Earnings
1.					
2.					
3.					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

2. Add the total expected value column and add the actual earnings column. Compare these two quantities and explain their meaning.

(Show me each fraction)

A **pass bet** wins if the first roll is a 7 or 11. It loses if the first roll is a 2,3, or 12. It wins if the first roll is rolled again before a 7 is rolled. Fill in the following steps to find the expected value of a pass bet.

1. Find P(7 or 11 on the first roll). (Answer: 0.222)

2. Find the probability that the first roll is rolled again before a 7 is rolled. To find this probability, first find the following:

P(4 on first roll)*P(4 again before a 7 is rolled)=
(Answer: $\frac{3}{36} * \frac{3}{3+6} = 0.0278$)

P(5 on first roll)*P(5 again before a 7 is rolled)=
(Answer: 0.0444)

P(6 on first roll)*P(6 again before a 7 is rolled)=
(Answer: 0.0631)

P(8 on first roll)*P(8 again before a 7 is rolled)=

P(9 on first roll)*P(9 again before a 7 is rolled)=

P(10 on first roll)*P(10 again before a 7 is rolled)=

3. Add all of the quantities in part 1 and part 2 to find P(winning).

4. Subtract 1-P(winning) to find the probability of losing.

5. The payout of a pass bet is 1:1. Thus evaluate P(winning)*($1) +P(losing)*(-$1) to find the expected value of the pass bet.