60 points

Statistics in Sports (Math 192) - Quiz #2
Spring 2009 - Brad Hartlaub

Name Brad Hartlaub - Solutions

Directions: Please answer all of the questions below. The point values for each problem are indicated in parentheses. Partial credit will be awarded if you show your work. Be careful not to spend too much time on any one part of a question.

1. According to MLB.com, Nick Swisher has had 2114 at bats during his career. The file P:\data\math\hartlaub\sportsstats\Swisher.MPJ contains a simulation of his at bats. Use the simulation results to answer the questions below.

a. Estimate Nick Swisher's probability of getting a hit in an at-bat after 50 ~~games~~ at bats. (5) $8/50 = .16$

b. Estimate Nick's chance of getting a hit in an at-bat after 100 ~~games~~ at bats. (5) $17/100 = .17$

c. What is your best estimate of Nick's probability of getting a hit? Explain. (10)
The best estimate is the one obtained after 2114 simulated at-bats. $\frac{497}{2114} = .235$

SOR = $\frac{539}{2114} \approx .255$

d. Nick has 539 strikeouts during his career. Explain how you would use Minitab to simulate his 2114 at-bats and create a graph of strikeout rate (SO/AB) versus at-bat. An outline of the appropriate Minitab commands, with appropriate details, is sufficient for full credit. (15)

1. Calc > Make Patterned Data > Simple Set of Numbers: C1 1 to 2114
2. Calc > Random Data > Uniform: 2114, Uni, 0 to 1
3. Calc > Calculator: SO, (Uni < .255)
4. Calc > Calculator: Cumulative-SO, PARS('SO')
5. Calc > Calculator: SOR 'Cumulative-SO'/C1
6. Graph > Scatterplot: SOR, C1

(The estimates based on a small number of at-bats are not very reliable.)

2. Big League Baseball. If the roll of a red die is 1 or 6, then the batter hits a fair ball. Two white dice are rolled and the outcome of the play depends on the roll of the dice shown in the table below.

	White Die 2					
White Die 1	1	2	3	4	5	6
1	Single	Out	Out	Out	Out	Error
2	Out	Double	Single	Out	Single	Out
3	Out	Single	Triple	Out	Out	Out
4	Out	Out	Out	Out	Out	Out
5	Out	Single	Out	Out	Out	Single
6	Error	Out	Out	Out	Single	Home run

a. Find the probability that the batter gets a double. (5) $1/36 = .0278$
b. Find the probability that the batter gets a triple. (5) $1/36 = .0278$
c. Find the probability that the batter gets a hit (single, double, triple, or home run). (5) $10/36 = 5/18 = .2778$
d. Find the probability that the batter gets on base. (5) $12/36 = 6/18 = 1/3 = .3333$
e. Find the probability that the batter gets on base as a result of an error. (5) $2/36 = 1/18 = .0556$

Some students considered all rolls of the dice. If the red die is considered, then all of the probabilities should be multiplied by $2/6 = 1/3$.