NAME: DUE DATE:

It's that *special* month of the year - March!! It's full of St. Patrick's day, National Pig Day, Pi Day, Dr. Seuss and Barbie's birthdays, but most of all MARCH MADNESS. For college basketball this is the time that the best 68 teams get a chance to contend for the national title through a huge one-elimination tournament. Throughout this project we will be following the games played in the tournament, the teams involved and the math and statistics that are also so prevalent. There will be a prize for the person(s) that guesses the most teams correctly! (Scoring will be decided by the class)

ASSIGNMENT #1A – *Watch* the selection show on Sunday on CBS! Through the coming weeks, we will be filling in brackets, choosing the teams you think will advance in each game until the final round. You will be able to keep track of the teams that advance and you correctly guessed each day.

ASSIGNMENT #1B – *Create* a method for scoring correct guesses on a bracket. If the class were to compete in a game where each person guesses who will advance to each subsequent round and finally choose the winner of the tournament, how would you assign points to this game? (i.e. one point per correct guess, 1 point for each correct in the first round then 2 in the second round, etc., 5 points for each in the first then 3 in the second, 100 points for the winner of the tournament…) Be creative, practical and thoughtful with this! On the page titled, **"Playing the Game"**, write up a paragraph or two describing your scoring system, an illustration or diagram may also be handy. You will then present your system to the class and we will decide which system we will use to actually play the game!

ASSIGNMENT #2 – *Research* teams. Using the bracket as a list of teams, research some interesting statistics that may help you guess the winning team of each game when you go to fill out your bracket. Arrange the information for the teams in the tables provided by region. You may team up with 1-2 of your classmates to complete this assignment.

- Stats you are looking for: Team by Region, Region Location, School Location. As well as at least 2-3 quantitative or qualitative statistics of your choice such as:

  QUANTITATIVE STATS
  % wins, average points per game, average points scored by opponents per game, field goal percentage, free throw percentage, 3 point field goal percentage, average turnovers per game, average steals per game, average blocked shots per game, etc.
  QUALITIATIVE STATS
  Team color, mascot, etc.

  You can do more than 3 if you think it will give you an advantage at choosing your teams!

- Be sure to fill in the team's overall win percentage in the final column as well! HINT: the team's winning percentage can be calculated from their win-loss record.

- Possible Resources:

  http://www.ncaa.com/

  http://www.ncaa.com/march-madness

  http://www.cstv.com/

  http://sports.espn.go.com/ncb/index

ASSIGNMENT #3 – *Fill out* your bracket!

ASSIGNMENT #4 – Complete the **"What are the Odds!?"** worksheet to check out probabilities in the tournament if all chances were equal.

ASSIGNMENT #5 – Complete the **"Wins vs. Total Games Played"** worksheet to examine win percentages in various categories.

**Note: the team's winning percentage can be calculated from the win-loss record (as researched or following the team name on select brackets)

ASSIGNMENT #6 – Complete the **"One and Done!"** worksheet to examine what happens when teams get eliminated from the tournament.

ASSIGNMENT #7 – Complete the **"Sweet 16 Low Down"** worksheet to take a closer look at the compatibility of the remaining 16 teams.

ASSIGNMENT #8 – If all 64 teams of the tournament were put into a hat, check out **"What's the Probability…"** of drawing different scenarios!

ASSIGNMENT #9 – Determine the probabilities associated with your personal bracket! Use 30 years of historical data to find **"Tournament Probabilities"**.

ASSIGNMENT #10 – At this point the tournament is done! How did your predications work out? Complete the worksheet **"A Final Look"** for an analysis.

FINAL ASSIGNMENT – **PUTTING IT ALL TOGETHER**

  All of the pieces you've worked on will be composed and reflected on in one final product!

- **FINAL REFLECTION:** Think back about all of the work and analysis you've done for the NCAA Basketball Tournament. What was new to you and what have you learned about the NCAA tournament? What did you already know about the tournament entering this project? What was the final outcome of your bracket? If you complete a bracket in the future, what will you keep in mind in order to make the most correct guesses possible? Address what have you learned about the role math has in the tournament? In all sports? What are some other areas that you could apply math to sports?

Write a typed, thoughtful, 1-page reflection addressing the above questions.

- **ASSEMBLING YOUR PROJECT:** Your final product should be all parts of this project, stapled in order. Be sure to add your filled out bracket, the article about the Sweet 16 as well as your final reflection. Make sure you have all parts and compile them in the following order:
   1) "Playing the Game" Proposal
   2) "Team Statistics" research of team stats by region
   3) Original bracket
   4) "What are the Odds!?"
   5) "Wins vs. Total Games Played"
   6) "One and Done!"
   7) "Sweet 16 Low Down" – include Sweet 16 article
   8) "What's the Probability"
   9) "Tournament Probability"
   10) "A Final Look"
   11) Final Reflection – typed

TEAM STATISTICS

Sample

1. From your bracket put the team name and find the school's location in the table.
2. Fill in the next columns with other stats you are interested in knowing (you can choose from the stat choices listed under Assignment #2).
3. Finally, calculate the win percentage for each team and fill in the final column with this percentage.

$$\text{Win Percentage} = \frac{\#\text{wins}}{\text{wins} + \text{losses}}$$

State   *REGION* [ ]   *LOCATION:* _____

Rank

	TEAM NAME	SCHOOL LOCATION	OTHER: *Ave. Pts. Per Game*	OTHER: *field goal percentage*	OTHER: *Free Throw Percentage*	OTHER: *Ave. Pts score by opponents*	OTHER:	WIN PERCENTAGE
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

East
Sara, Jillian,
Val, Sade,
Cam, Jerry

South
Audra, Mallory,
Tom, Anthony,
Brett, Alexis

West
Chloe, Kayla,
Joe, Michael,
Bobby, Courtney

Mid west
Olivia, Heather,
Maddy, Julia,
Matt, August

REGION 2   *LOCATION:* _____

TEAM NAME	SCHOOL LOCATION	OTHER:	OTHER:	OTHER:	OTHER:	OTHER:	WIN PERCENTAGE

REGION 3   *LOCATION:* _____

TEAM NAME	SCHOOL LOCATION	OTHER:	OTHER:	OTHER:	OTHER:	OTHER:	WIN PERCENTAGE

REGION 4   *LOCATION:* _____

TEAM NAME	SCHOOL LOCATION	OTHER:	OTHER:	OTHER:	OTHER:	OTHER:	WIN PERCENTAGE

PLAYING THE GAME

In the space below explain/provide an accompanying diagram for how we will assign points and score brackets to determine a winner.

1, 2, 4, 8, 16, 32

What are the Odds!?

Pg. 10

1. If the names of all 68 teams in the NCAA Basketball Tournament were put into a bag, what would be the probability of drawing the winning team out of the bag? Explain how you arrived at your answer.

   1/68   There is one winning team in the bag out of 68 total possible winners.

2. How many states are represented in this year's tournament?

   37

3. How many teams are from Michigan? What's the probability of a school playing against a Michigan team?

   2 from Michigan

   2/67

4. From which state would you have the best chances of choosing a team if the teams were drawn from a bag? Explain your answer.

   NY, TX, VA all 5 teams each

   $P(NY) = 5/68$ $P(TX) = 5/68$ $P(VA) = 5/68$

5. What percentage of all 50 states is represented? Show your work below.

   37/50 × 100 = 74%

Wins vs. Total Games Played

You should have at this point examined the winning percentages for all ~~68~~ 64 teams. Let's look at how wins play out over the entire season between the lot of ~~68~~ 64 teams in the tournament.

Express as a fraction, decimal and percent the ratio of wins to total games played for the following:

➤ **REGIONALLY:** $\dfrac{\text{Total \# wins}}{\text{Total \# games}}$

REGION	FRACTION	DECIMAL	PERCENT
1 East	378/523	.722	72.2%
2 West	401/529	.758	75.8%
3 South	391/534	.732	73.2%
4 Midwest	402/535	.751	75.1%

?: Does it appear that one of the regions has more "winners" than the others? How do the regions compare? Does the balance seem fair for the competitiveness of the tournament?

_____
_____
_____
_____

➤ **OVERALL FOR ALL 68 TEAMS:**

REGION	FRACTION	DECIMAL	PERCENT
All regions, and teams combined			

?: How does the overall compare to each region? How does it compare to the win percentage for individual teams?

_____
_____
_____
_____

➤ _**YOUR** FINAL FOUR TEAMS:_

TEAM	FRACTION	DECIMAL	PERCENT

?: How do the win percentages for your final four teams compare to those of other teams? Does it appear that one team should be the clear winner of the tournament?

_____
_____
_____
_____
_____

?: Explain the benefit and danger of using these statistics to predict the outcome of the tournament.

_____
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_____

One and Done! pg.13

Complete the table by doing the following:

1. Find the number of teams eliminated after each round
2. Tell what fraction of the teams are eliminated after each round
3. Change each fraction to a decimal and percent

64 teams

ROUND	# TEAMS ELIMINATED	FRACTION OF TOTAL TEAMS	DECIMAL AMOUNT OF TEAMS	PERCENT OF TOTAL TEAMS
1ST	32	$\frac{1}{2}$	.5	50%
2ND	16	$\frac{16}{64} = \frac{1}{4}$	.25	25%
3RD (Sweet 16)	8	$\frac{8}{64} = \frac{1}{8}$	.125	12.5%
4TH (Elite 8)				
5TH (Final 4)				
6TH (Final)				

4. Do you see any patterns in the way the teams are eliminated? Explain.

5. Write an equation to determine the number of teams left based on the round.

$n = \text{\# of round}$

$\text{Left} = 64\left(\frac{1}{2}\right)^n$

6. ~~Use your equation to determine~~ how many teams are necessary if one more round were added to the tournament. Show work!

128   (64×2)

7. What about if 2 more rounds were added? Show work!

256   (128×2)

8. Add all of the fractions in your table together. How many more rounds will it take until they equal 1? Explain your answer.

9. Use the information you found in #8 to **PREDICT** the sum of the decimal and percent columns. Justify your answers.
    Decimal sum prediction: _____
    Justification:

    Percent sum prediction: _____
    Justification:

10. Find the ACTUAL sum of the decimal column. Show your work below.

11. Find the ACTUAL sum of the percent column. Show your work below.

12. How do each of your answers in #10 and 11 compare to your predictions?

Sweet 16 Low Down *pg.15*

Three quarters of the teams are out! Take a look at the lucky 25% that get to keep competing:

1. Find each "Sweet 16" team's win-loss record before the tournament started.
2. Calculate the offensive averages for each team in the first 2 rounds using the statistics provided. (Offensive average would the average amount of points scored against the other two teams)
3. Calculate the defensive averages for each team in the first 2 rounds using the statistics provided. (Defensive average would be the average amount of points allowed to each of the other two teams)
4. Calculate the differences between the offensive and defensive averages for each team.

FILL IN THE TABLE BELOW WITH YOUR ANSWERS TO 1 - 4:

East

	TEAM	Wins-Losses	Offensive Average	Defensive Average	Difference
Region 1	Duke	29-5 85.3%	85,77 81	62,76 69	12
	VaTeck	24-8 90.6%	66,67 66.5	52,58 55	11.5
	LSU	26-6 81.2%	79,69 74	74,67 70.5	3.5
	MI State	28-6 82.9%	76,70 73	65,50 57.5	15.5
Region 2					
Region 3					
Region 4					

5. Rank the teams from best to worst in each of these four categories.

RANK	WINS-LOSSES	OFFENSIVE AVERAGE	DEFENSIVE AVERAGE	DIFFERENCE
	H → L	H → L	Lowest → H	H → L
1	Houston			
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

6. Explain the significance of the "Difference" between offensive and defensive averages column. How does this quantity help you to compare teams?

_____
_____
_____
_____
_____
_____

7. Could you devise a method for seeding the top 16 teams based on the above statistics? How would the seeding look (aka how would you rank the teams)? Who would play one another and why would you choose those games to be played? Cite the stats that would matter most to your new seeding system. Write a concise paragraph addressing these issues.

_____
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8. ***Everyone's got an opinion!*** Find an article online or in a newspaper or magazine that discusses the Sweet 16 teams. What do the "experts" say about the different team's chances of advancing to the Elite 8 and Final Four? Look for an article that discusses statistics, probability or has a mathematical reference. What is that reference and how relevant does it seem? How is it being used to further the author's argument? Write 1-2 paragraphs discussing the above. Print the article and include it in your final project submission.

TITLE OF ARTICLE: _____

URL: _____

DISCUSSION:

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Pg.17

9. Given your examination of this information, would you like to rearrange your picks for the following rounds? Do so in the blank bracket provided and for comparison's sake we will keep track of both your original and revised brackets.

Pg.18

SWEET 16   ELITE EIGHT   FINAL FOUR   CHAMPION   FINAL FOUR   ELITE EIGHT   SWEET 1

REGION 1

REGION 2

Semifinal

Semifinal

REGION 3

REGION 4
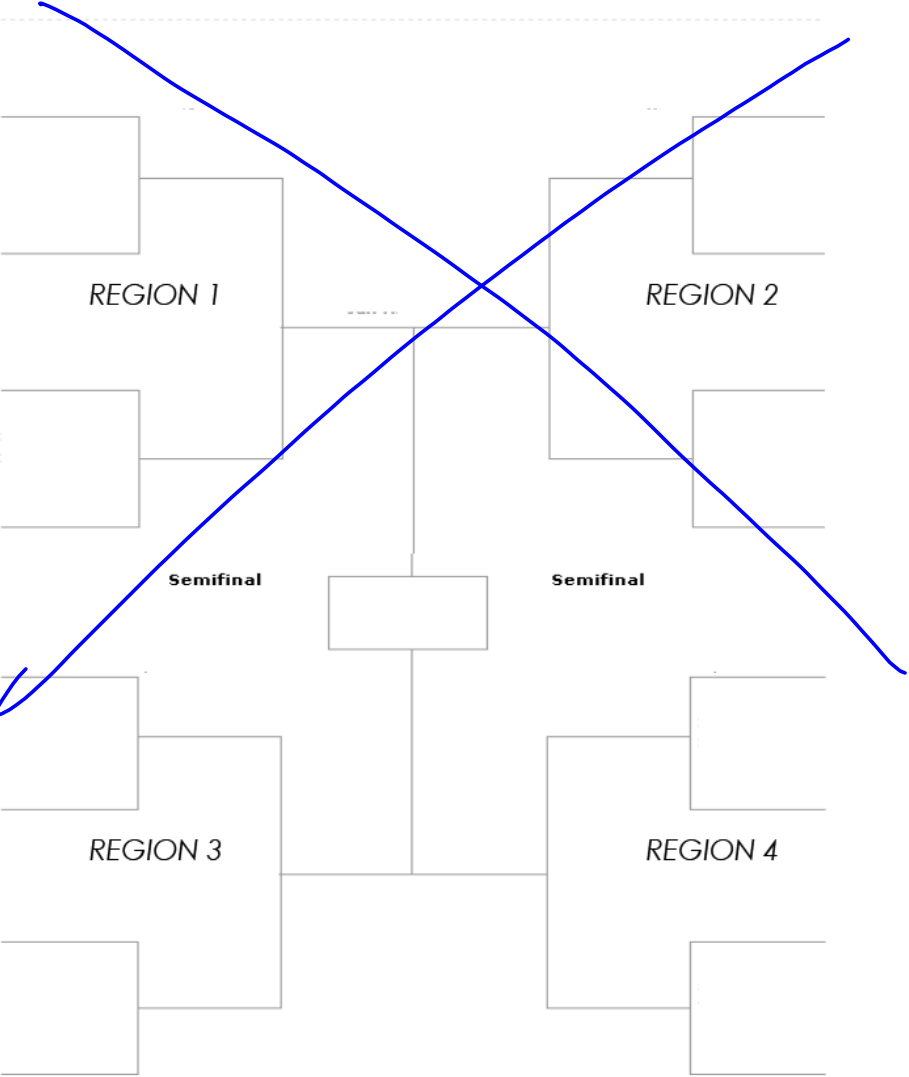
If all 64 teams were put into a hat,

WHAT'S THE PROBABILITY.........

Pg. 19

1. How many possible ways are there to fill out the bracket after the play-in team has been (64 teams) decided? Calculate and explain.

    63 games played

    $$2^{63} = 9,223,372,036,854,775,808$$

    9 quintillion

2. a. What's the probability that a person in this class would fill out a perfect bracket, choosing teams only by guessing?

    $1/2^{63}$

    b. How about one of the 300 million people in America?

    $$\frac{300,000,000}{2^{63}} = .00000000003253$$

    c. How about one of the 6 billion people in the world?

    20x's more

    $$\frac{6,000,000,000}{2^{63}} = .0000000006506$$

    ---

3. Of choosing Michigan or Michigan State?

    $2/64$

4. Of choosing a 10 seed?

    $4/64$

5. Of choosing a team that pulled off an "upset" in the first round? ("upset" will mean a lower seed beat a higher seed)   32

    $16/32 = 1/2$

6. Of choosing a team that eventually made it to the Elite 8?

    $8/64$

7. Of choosing a team that is at least a 6 seed?   6,7,8,9,10,11,12,13,14,15,16

    $11/16$ or $= 44/64$

Or = X
and = X

8. Of choosing a team that is a 3 seed or higher or less than an 11 seed?

9. Of choosing a 1 or a 16 seed?

10. Of choosing an Ohio team or a team west of Colorado.   CA, WA, OR, ID, NV, AZ, UT, OH

11. Of choosing a 1 or a two seed that made it to the Sweet 16.

12. Of choosing a team that starts with the letter M or played in the west region.

Pg 20

13. Of drawing Michigan and then drawing Michigan State (without replacement).

14. Of drawing an even seeded team, replacing that team, and then drawing another even seeded team.

15. Of drawing an even seeded team, and another even seeded without replacing the first.

google

16. Of drawing a team from the Big Ten, *and* then from the ACC, *and* then from the Big East without replacement.

17. Of drawing 3 teams from the Big Ten without replacement.

18. Make your own probability questions about the tournament that use "AND" and "OR" that are mutually exclusive or not. Then show the calculations and answer to your problems.

AND:

OR:

M
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T
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M
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D
N
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s

Tournament Probability

pg.2)

Fill out a bracket for your prediction of this year's winners!
Based on the bracket that <u>you fill out</u> and the historical
probabilities that have been assigned to each seed...

1. Find the theoretical probability that Michigan wins the tournament.
2. Find the theoretical probability that Michigan State wins the tournament.
3. My favorite team in the tournament is _____. It is seeded #_____.
   Find the probability that your favorite team would win the championship this year based on the
   historical probabilities of that seed.
4. Find the theoretical probability that the National Champion you picked wins the tournament.
5. Find the theoretical probability that a 1 or 2 seed wins the tournament.
6. Find the theoretical probability that you would have correctly picked all four Final 4 teams.

<u>**CLEARLY SHOW ALL WORK**</u> for full credit :

1) $P(\text{michigan wins}) = 1/64$

2) $P(\text{MI State wins}) = 1/64$

3) Syracuse #8
   Win: 1st and 2nd and 3rd and 4th and 5th and 6th Round
   $.508 \times .180 \times .636 \times .571 \times .5 \times 0 = 0$

4) $P(\text{Duke}) = 1/64$

5) $P(\#1 \text{ or } \#2 \text{ wins}) = 4/64 + 4/64 = 8/64 = 1/8$

6) $P(\text{any 1 team gets to Final 4}) = \text{Must win } 1^{st} \text{ 4 games}$
   $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{16}$

   $P(\text{Picked 4 Final 4 Teams}) = \frac{1}{16} \times \frac{1}{16} \times \frac{1}{16} \times \frac{1}{16} = \frac{1}{1,048,576}$

Tournament Probabilities – Historical Data from 1985-2015

The win-loss record and probabilities of teams winning by round, based on 30 years of tournament data, are given in the tables below.
*Note: There is no table for the 16 Seeds because they have yet to advance!

Number 1 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W–L
120-0	104-6	82-22	49-33	28-21	19-9	402-101
1.000	0.867	0.788	0.598	0.475	0.679	0.799

Number 2 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W–L
113-7	76-37	55-21	25-30	12-13	4-8	285-116
0.942	0.673	0.724	0.455	0.480	0.333	0.711

Number 3 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W–L
100-20	61-39	30-31	14-16	9-5	3-6	217-117
0.833	0.610	0.492	0.467	0.643	0.333	0.650

Number 4 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W–L
95-25	55-40	20-35	13-7	3-10	1-2	187-119
0.792	0.579	0.364	0.650	0.231	0.333	0.611

Number 5 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W–L
76-44	39-37	8-31	6-2	3-3	0-3	132-120
0.633	0.513	0.205	0.750	0.500	0.000	0.524

Number 6 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W–L
80-40	41-39	13-28	3-10	2-1	1-1	140-119
0.667	0.513	0.317	0.231	0.667	0.500	0.541

Number 7 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W–L
72-48	21-51	9-12	2-7	1-1	1-0	106-119
0.600	0.292	0.429	0.222	0.500	1.000	0.471

Number 8 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W-L
61-59	11-50	7-4	4-3	2-2	0-2	85-120
0.508	0.180	0.636	0.571	0.500	0.000	0.415

Number 9 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W-L
59-61	5-54	2-3	1-1	0-1	0-0	67-120
0.492	0.042	0.400	0.500	0.000	0.000	0.558

Number 10 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W-L
48-72	22-26	7-15	0-7	0-0	0-0	77-120
0.400	0.458	0.318	0.000	0.000	0.000	0.390

Number 11 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W-L
40-80	16-24	6-10	3-3	0-3	0-0	65-120
0.333	0.400	0.375	0.500	0.000	0.000	0.351

Number 12 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W-L
43-77	19-24	1-18	0-1	0-0	0-0	63-120
0.358	0.442	0.053	0.000	0.000	0.000	0.344

Number 13 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W-L
24-96	6-18	0-6	0-0	0-0	0-0	30-120
0.200	0.250	0.000	0.000	0.000	0.000	0.200

Number 14 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W-L
20-100	2-18	0-2	0-0	0-0	0-0	22-120
0.167	0.100	0.000	0.000	0.000	0.000	0.155

Number 15 Seeds

ROUND of 64	ROUND of 32	SWEET 16	ELITE 8	FINAL 4	FINALS	TOTAL W-L
7-113	1-6	0-1	0-0	0-0	0-0	8-120
0.058	0.143	0.000	0.000	0.000	0.000	0.063

A FINAL LOOK

For this analysis you will use <u>your</u> filled out bracket, marked with correct/incorrect entries based on what has transpired in the tournament.

1. For the final four teams you picked: Make a percent comparison between the number of wins that they had vs. the total number of games they played in the tournament.

MY FINAL FOUR TEAM NAMES	TOURNAMENT WIN PERCENTAGE

2. What do you notice about the different teams percentages compared to their success in the tournament?

3. Express as a ratio the number of YOUR correct guesses to total guesses as a fraction, decimal and percent for the **entire tournament**.

4. Use the space below to make a relative frequency distribution of your correct guesses in each round of the tournament. Then make an appropriate graph that displays a comparison of your correct guesses for <u>each round</u> of the tournament.

5. Describe the distribution (the SOCS – Shape, Outliers, Center, Spread).

QUICK FACTS

- The 65 team tournament has only existed since 2001. Prior there were 64 teams from 1985-2000. Before that the tournament underwent many changes and grew variably from 8 teams in 1939 to 53 teams in 1984 before becoming the tournament we know today.

- 1/6 of the money made from the tournament goes directly to the schools. 1/3 goes to the schools based on scholarships they give out. 1/2 goes to conferences based on how well they did in the six previous men's basketball tournaments. In 2007 the Big East received over $14.85 million. The eight conferences that didn't win a first round game in those six years even received over $1 million each.

- Only 6 teams since the seeding system have been ranked #1 in a season poll and gone on to win the tournament: North Carolina (1982), Duke (1992), UCLA (1995), Michigan State (2000), Duke (2001), Florida (2007).

- Since the NCAA started seeding teams in 1979, only once have all four #1 seeds made it to the Final Four: (2008) Kansas, NC, Memphis, UCLA.

- At least one #1 seed has made it to the Final Four in every year except:
  - 1980: Louisville #2, Iowa #5, Purdue #6, UCLA #8
  - 2006: UCLA #2, Florida #3, LSU #4, George Mason #11

- The only team to beat 3 #1 seeds in a single tournament was #4 Arizona in 1997. This is the most possible 1 seeds that can be played.

- 2009 marked the first time all 12 of the #1, 2, and 3 seeds made it to the Sweet 16.

- No team as a #16 seed has ever defeated a #1 seed.

- The #12 seed has beaten the #5 seed 44% of the time.

- The smallest margin of victory in a championship game: 1 point
  - One of those: Michigan 80, Seton Hall 79 in OT (1989)

- Biggest margin of victory in a championship game: 30 points
  - UNLV 103, Duke 73 (1990)

- UCLA, Michigan State and Duke are the only teams to ever win every game in the tournament by 10 points or more on their way to a championship. Michigan State accomplished this twice (1979, 2000).

- As a tournament ritual, the winning team cuts down the net at the end of the regional championship game as well as the national championship game.

- Since 1986, the winning team is traditionally given the floor from the championship venue to keep.

About brackets…

- There are **9,223,372,036,854,775,808** possible brackets. (over 9.2 quintillion)
  - If one bracket per second was filled out it would take **292 trillion years** to fill out all possible brackets (that's 20 times longer than the universe has existed).
  - If all brackets were stacked on top of each other (on standard paper), the pile would reach **from the moon and back over 1.1 million times**.
  - Even if a person had a 90% chance of winning each game they picked, their odds would still be **763 to 1** against picking a perfect bracket.

Below you will find a table that shows all teams that have won a national title through 2008. Use this information to answer the questions that follow.

School	Titles	Years
Arizona	1	1997
Arkansas	1	1994
California	1	1959
CCNY	1	1950
Cincinnati	2	1961, 1962
Connecticut	2	1999, 2004
Duke	3	1991, 1992, 2001
Florida	2	2006, 2007
Georgetown	1	1984
Holy Cross	1	1947
Indiana	5	1940, 1953, 1976, 1981, 1987
Kansas	3	1952, 1988, 2008
Kentucky	7	1948, 1949, 1951, 1958, 1978, 1996, 1998
La Salle	1	1954
Louisville	2	1980, 1986
Loyola (Chicago)	1	1963
Marquette	1	1977
Maryland	1	2002
Michigan	1	1989
Michigan State	2	1979, 2000
North Carolina	4	1957, 1982, 1993, 2005
North Carolina State	2	1974, 1983
Ohio State	1	1960
Oklahoma State	2	1945, 1946
Oregon	1	1939
San Francisco	2	1955, 1956
Stanford	1	1942
Syracuse	1	2003
UCLA	11	1964, 1965, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1975, 1995
UNLV	1	1990
Utah	1	1944
UTEP (Texas Western)	1	1966
Villanova	1	1985
Wisconsin	1	1941
Wyoming	1	1943

6. Of all teams that have won a title, find:
   a. The mean number of titles won.
   b. The median number of titles won.
   c. The mode.
   d. The range.
   e. The standard deviation.
   f. Are there any outliers? Justify with calculations.

7. Which one of these quantities in a – e give the best representation of the data? Explain.

8. Make a box plot of the data in the space below. (Don't forget to consider and plot the outliers!)

9. Analyze the performance of teams in the tournament by seed. A table and graphs are provided below for your use and organization.

Seed																
Wins																

a. Plot a scatterplot of seed vs. number of games won in the tournament on the first graph below. Don't forget to scale and label your axes appropriately. Describe the association in a sentence (include Strength, Form, Direction).

b. Enter the data into your calculator and perform a least squares regression. Write the regression equation and the correlation below.

c. Plot the LSRL on your scatterplot.

d. Create a residual plot. Plot it on the second graph provided.

e. Comment on the suitability of the LSRL as a model for the data.

f. Show how the residual for a 5 seed is calculated.
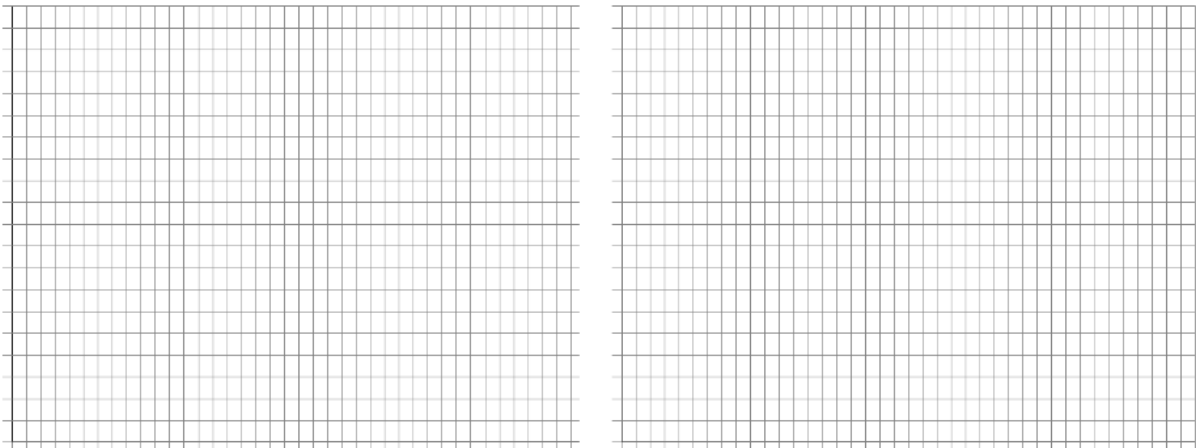
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