

Namecheq Dat Stat

1. We wonder if the new Kanye West single is as significantly different as advertised. On average, Kanye West songs have 10.1 beats per minute, with a variance of 7.9. This song has a mean 11.1 beats per minute, with a standard deviation of .80.
2. There is a violent discussion over the distinction between stealing versus sampling old hits. Data is then collected as to whether people believe they steal ($n = 20$) versus sample classics ($n = 48$) or whether they believe there isn't a distinction ($n = 100$).
3. A researcher examines differences in the frequency of using colloquial words in people who have versus have not completed a college degree, accounting for region and socioeconomic status.
4. MF Doom and Aerosmith decide to combine their talents to produce a new musical genre ("Aerodoom"). We believe approximately half of the fans of this new genre listened to either MF Doom or Aerosmith before they became Aerodoom fans. We examine Aerodoom fans and determine how many people listened to MF Doom ($n = 199$), Aerosmith ($n = 200$) or neither ($n = 25$) before becoming Aerodoom fans.
5. We investigate the number of times people listen to classical music, depending on whether they drive ($n = 40$, mean = 38.14, SD = 4.87), take the bus ($n = 40$, mean = 24.41, SD = 16.83), ride a bike ($n = 40$, mean = 28.4, SD = 3.2) or walk ($n = 20$, mean = 14.5, SD = 2.2).
6. We examine the number of songs people belt out in their cars in America (mean = 5.45, SD = 1.24). In Europe and other continents, people generally sing 1.5 songs on average.
7. We wonder how many times Malcolm McLaren stole from the Sex Pistols. We decide to ask each band member. We believe, however, that their decision may be confounded by their current financial situation. We therefore ask each member before versus after receiving a large sum of money. Sadly, S. Vicious dies before the end of our study.
8. We examine sex differences in the number of times people order martinis. Females order 1.4 martini drinks, with a SD of 4.5. Males order 2.4 martini drinks, with a SD of 14.8.
9. We are fascinated in the effects of music preference on the number of times people begin to dance randomly. We sample people who listen to rock ($n = 42$, mean = 14.56, SD = 4.23), rap ($n = 42$, mean = 14.44, SD = 2.34) or country music ($n = 42$, mean = 14.52, SD = 2.44).

10. A researcher examines how often people dream as well as how often they laugh weekly. She finds people dream 7.5 times a week, on average, with an SD of 1.4.
11. We believe that travel may affect interest in other cultures. We ask people how often they leave the country as well as how often they pursue opportunities to learn more about other cultures.
12. A statistician's wife dies tragically in a car accident. Others believe he is crazy, but he believes she knew what was going to happen. On average, she would smile for 1.4 seconds, with a standard deviation of .40. The last time she saw him before the car accident, however, she smiled for 4.5 seconds.
13. We investigate how often people rank themselves as smartest in their intellectual circles relative to whether they've successfully read *Ulysses*. We control for education level, because college students may feel more pressured to read *Ulysses*.
14. We examine the relationship between political party and voter registration in 500 college students. We find that 60% of Republicans ($n = 225$) are registered, whereas 50% of Democrats ($n = 275$) are.
15. We investigate how much undergraduates hate statistics after taking required coursework in Psychology ($n = 100$), Statistics ($n = 100$) or Math ($n = 100$), from a scale of 0 – 5.
16. Public opinion believes 70% of celebrities advertise but do not actually commit to rigorous dieting. We collect data and find 150 advertise, but do not diet; 240 do not advertise, but do diet; and 140 do not advertise or diet.
17. We investigate the effects of ketamine on baby crying. We treat some children, who cry 0.4 times, on average, with a SD of 1.4. The other group of children, left untreated, cry a mean 5.4 times, with a SD of 2.3.
18. We believe mood (happy, neutral, upset) may affect whether people enjoy *Happy Feet*. We find 100 people enjoyed the movie when happy, 50 when neutral, 20 when upset. In contrast, 10 people did not appreciate *Happy Feet* when happy, 40 when neutral, 70 when upset.
19. We examine effects of taking a test on anxiety levels in 29 psychology students, sampling students before versus after an exam. Our skew, however, is greater than 12, as is our kurtosis.
20. How does one determine if just as many people mourned Anna Nicole as Aaliyah and Lisa "Left Eye" Lopes?

21. We believe that marriage may affect how often people compromise under social pressure. We distribute a survey to single and married people, determining how often subjects feel they compromise (1 = few times, 5 = many times).
22. A researcher investigates how often people compute non-parametric statistics, if their data has violated assumptions of parametric tests. He investigates people whose data are not normally distributed ($n = 400$, mean = 40, SD = 4), do not have homogenous variances ($n = 400$, mean = 70, SD = 3) or are ordinal ($n = 500$, mean = 39, SD = 3).
23. We examine the number of gladiator movies made by producers who have versus have not spent time in Italy. We control for age and socioeconomic status, which may affect the ability to travel.
24. A researcher investigates the relationship between the yearly number of electronic artists in Britain (Mean = 204.98, SD = 28.47) and the yearly number of new electronic genres (Mean = 3.44, SD = 1.08).

It's More Fun to Compute

1. A researcher investigates the relationship between diet coke and ulcers in a sample of 100 college girls. She finds a positive correlation ($r = .53$).
 - a. How “good” is this correlation, according to rules of thumb in this class?
 - b. How much variability in diet coke is actually explained? Ulcers?
 - c. Is this correlation significant?
 - d. State your conclusions.
2. A scientist believes the number of times a bonobo chimp listens to James Brown can affect his abilities to attract mates ($N = 30$). She finds the following relationship, which explains 84.46% of the variance.

$$Y = 2.4123x + 1.09$$

$$S_{x|y} = .8738$$
 - a. State the null and alternative hypotheses. Be explicit – what do these hypotheses mean?
 - b. How “good” is the correlation coefficient between these variables, according to rules of thumb in this class?
 - c. If a male listened to James Brown 5 times, how many mates would he be predicted to attract?

- d. What is the probability of attracting 15 mates, if a male listens to James Brown 8 times? Could this probability be due to chance alone?
3. We become fascinated in the relationship between listening to hip hop and hating statistics in a sample of students ($r = .78$, $N = 46$).
 - a. Is this correlation significant?
 - b. What are the possible conclusions/inferences we can make from this relationship?
 4. A therapist examines the relationship between consuming hallucinogens and writing esoteric poetry in 450 high school students. He records the number of hallucinogens and poems written for each student. He finds a correlation coefficient of $.52$, y-intercept of 2.485 and a slope of $.8746$.
 - a. Is this a significant correlation?
 - b. How much variance is explained?
 - c. One student who has taken 7 hallucinogens writes 20 poems. What is the probability of this occurring due to chance alone?

5. There's a UW INSTRUCTOR MASSACRE!

	<u>Statistics</u>	<u>Philosophy</u>	<u>Business</u>
Number Killed:	69	20	41

- a. What statistic should you compute? Justify your answer.
 - b. Compute, state null/alternative hypotheses and conclusions.
6. We are among a series of massacres on college campuses. Generally, 50% of instructors massacred are businessmen, 25% philosophers, 25% statisticians.
 - a. What statistic should you compute? Is this more or less powerful than (or the same as) the statistic in #5? Justify your reason.
 - b. Compute, state null/alternative hypotheses and conclusions. Be specific to the story – what do your conclusions mean in relation to UW (vs other college massacres)?

7. We examine the relationship between taking statistics and murdering. Compute the appropriate stat, state null/alternative hypotheses and conclusions.

	<u>Statistics</u>	<u>No Statistics</u>
Murderin'	60	40
No Murderin'	20	15

8. Calculate the following, using the appropriate chi-square. State conclusions.

	<u>Death</u>	<u>No Death</u>
Bleeding	90	50
Some Bleeding	42	48
No Bleeding	10	42

	<u>Albums Sold</u>
Bald Britney	145
Mobb Deep	300
Nirvana	150
Happy Hardcore	50
Mozart	130

	<u>Halo</u>	<u>Zelda</u>	<u>Street Fighter</u>
American Idol	5	15	20
Grey's Anatomy	1	1	3
The Wire	80	60	42

9. We believe the relationship between taking statistics and murdering is mediated by a student's final GPA. We examine GPAs from murdering versus non-murdering statistics students. Compute the appropriate non-parametric test.

GPA

Murdering	2.1	3.8	1.9	2.4	1.4	3.0	2.0
Non-Murdering	4.0	1.8	2.7	2.9	1.9	3.1	4.0

10. How could we increase our power for the previous study above? Re-compute the above problem using each suggestion.

11. Compute the following data – first as a Wilcoxon, then as a Mann-Whitney.

a.

4.00	10.00
3.00	8.00
2.00	8.00
7.00	9.00
3.00	9.00
4.00	15.00
2.00	7.00
5.00	8.00
4.00	12.00
6.00	7.00

b.

3.82	6.52
10.10	4.73
4.15	7.28
5.11	7.74
13.50	11.85
14.84	9.56
9.75	11.05
13.53	6.34
18.74	4.68

c.

12.74	2.00
10.67	7.00
10.96	3.00
10.97	8.00
11.77	.00

d.

1	1
4	3
3	2
4	5
7	7
6	5
6	1
0	0
7	4

12. Calculate K-W for the following data. Also – state why you might prefer K-W to ANOVA for these columns/groups.

a. .95 3.37 7.65
-1.92 4.42 11.09
.84 5.79 3.72
1.52 4.52 7.42
-.24 3.46 12.14

b. 9.00 6.00 100.00
8.00 5.78 25.00
9.00 6.02 25.00
8.00 6.00 14.00

c. 9.90 12.47 15.29 19.52
12.35 12.24 15.41 15.79
13.66 13.74 16.40 45.40
-2.08 8.88 13.84 12.22
9.19 11.68 15.56 5.62