

Name: Key

Math 127 – Test 1 – Summer 2016

**This is an individual assignment.**

**Students may not work together or consult the Math Lab staff.**

**Do not check your answers with your classmates.**

**Any suspicious answers will be investigated, and your instructor has a peculiar brain that recognizes similarities. Don't cheat, because you will be caught.**

**The penalty for cheating on this exam is a grade of 0% for Math 127 Exam 1.**

**Oath: "I understand what's being said above. I won't cheat on this exam. If I do, I'll get a 0 and Professor Kupe will be severely disappointed in my actions."**

Sign Name: Key

#### **Student Instructions**

1. This test is graded out of 100 points and counts for  $1/7 = 14.28\%$  of your Math 127 grade.
2. Show work or points will be deducted. If you only report an answer and it is wrong, you will receive no credit.
3. Turn in this paper with your handwritten answers.

#### **Due Date:**

**Morning Class**, Math 127 01 – Due Wednesday, June 29 at 12:00 noon.

**Night Class**, Math 127 02 – Due Wednesday, June 29 at 5:00 pm.

The answer key will post Wednesday evening, and graded exams will be returned your next class meeting.

Good luck! I'm rooting for you.



1. StatCrunch skills and data analysis. Load up the "2010 Movie Revenue" dataset. Round all summary statistics to two decimals if necessary. Give all percentages rounded to two decimals, e.g. 13.58%. (4 points each)

1a. 29.82% What percentage movies were rated "PG-13"? 113/379

1b. 16 How many movies did "Lionsgate" release? 16/593 = 2.70%

1c. 2,077,467 Give the mean "Tickets Sold".

1d. 6,021,170 Give the mean "Tickets Sold" for "Summit Entertainment's" movies.

1e. 7 How many "R" movies did "Sony Pictures" release? (not classic +17)

1f. 144 How many movies sold at least 1,000,000 tickets?

1g. 237 How many movies sold at most 10,000 tickets?

1h. 11,481,582 95<sup>th</sup> percentile for "Tickets Sold".

1i. 2.18 Convert "Tickets Sold" for "Jackass 3D" to a z-score and show the calculation here:

$$z = \frac{y - \bar{y}}{s} = \frac{14,918,397 - 2,077,467}{5,884,426} = 2.18$$

- 1j. Give a range of values for "Tickets Sold" that would not be unusual. Use the idea of z-scores. Your answer should be an interval of values. Show calculation here:

Not Unusual is inside  $z = \pm 2$

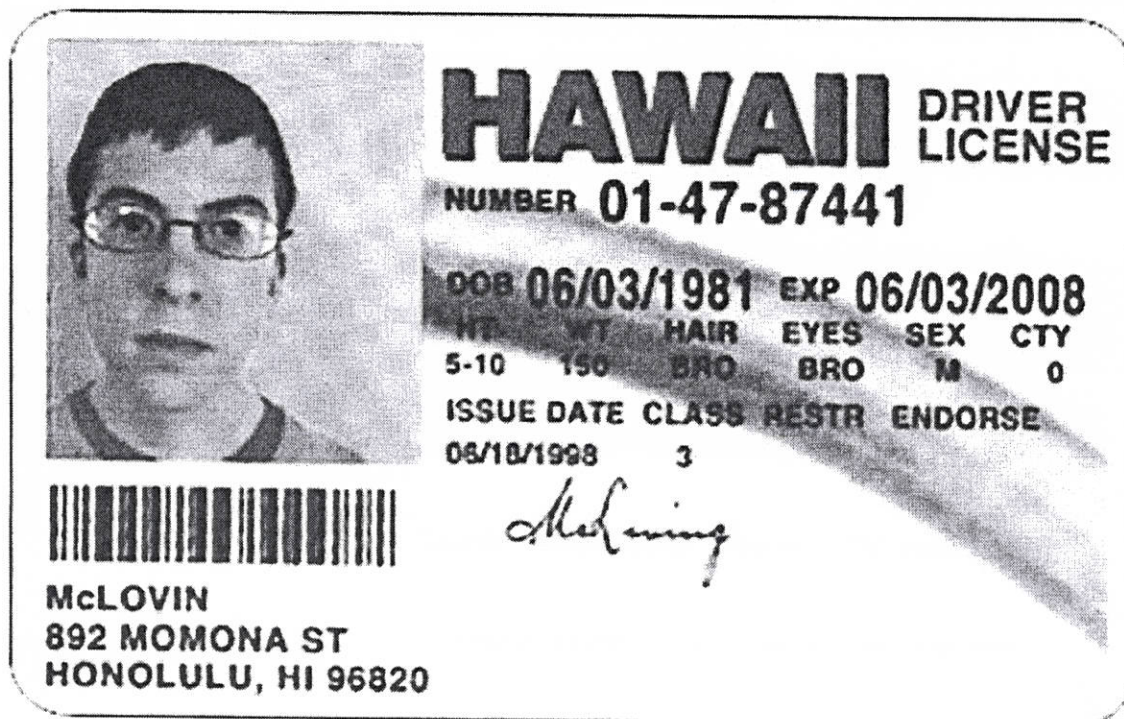
$$\bar{y} \pm 2s$$

$$2,077,467 \pm 2(5,884,426) \Rightarrow (-9,691,385, 13,846,319)$$

- 1k. There are 134 movies that are official high outliers. Give the "Movie" title of the first movie that is an outlier. I'm looking for the smallest high outlier. The answer is not "Toy Story 3".

Answer: Case 39

$$UF = 1591649$$



2. (4) Here is McLovin's driver license.

Type of Variables (Q, C, or I):

"Number" I      "HT" Q      "WT" Q  
 "Hair" C      "Eyes" C      "Sex" C  
 "Class" C      "Zip Code" C

3. (3) We break Cecil College into student groups – teens, 20s, 30s, 40s, 50s, 60+ – and we take a random sample of size  $n = 10$  from each group. We ask for input on designing a parking garage. What is the sampling method?

Sampling method: Stratified

4. (3) We break Cecil College into student groups – the majors – accounting, art, etc... – randomly select one major, and then survey everyone in that major. We ask for input on college tuition and financial aid.

Sampling method: Cluster

5. (3) How many IQRs apart are the Lower Fence and the Upper Fence? 4 =  $1.5 + 1 + 1.5$

Show calculation or reasoning below:

$1.5 \text{ IQR} \mid \text{IQR} \mid 1.5 \text{ IQR}$   
 LF       $Q_1$        $Q_3$       UF

OR Algebra

$$UF - LF =$$

$$[Q_3 + 1.5(\text{IQR})] - [Q_1 - 1.5(\text{IQR})] =$$

$$[Q_3 - Q_1] + 3(\text{IQR}) =$$

$$\text{IQR} + 3(\text{IQR}) = 4(\text{IQR})$$



6. In the "Darts" dataset on StatCrunch, we have the results of a designed experiment. Three students were recruited to see if "Accuracy" was affected by either "Distance" or "Hand" used.

"Accuracy" is the number of inches a dart is from the bull's-eye. Smaller numbers are better!

- 6a. (2) Response Variable: Accuracy
- 6b. (2) Factor 1: Distance Factor 2: Hand
- 6c. (2) Which "Hand" is the most accurate? Right  
 Justify: Mean  $\bar{R}$  = 3.21 inches, much better than Mean  $\bar{L}$  = 5.31 inches.
- 6d. (2) Which "Distance" is the most accurate? Near  
 Justify:  $\bar{Y}_{near} = 2.79''$   $\bar{Y}_{middle} = 4.27''$   
 $\bar{Y}_{far} = 5.71''$
- 6e. (2) Which "Student" is the most accurate? 2 (it's close)  
 Justify:  $\bar{Y}_2 = 4.075''$ ,  $\bar{Y}_3 = 4.25''$   
 $\bar{Y}_1 = 4.44''$
- 6f. (2) Give Student 3's mean "Accuracy" from "Near" distance with her "Right" hand: 2.35''

7. (5) Describe the distribution of "Weeks Worked Last Year" in the "General Social Survey 2008" dataset. Bullet points are OK, use the values of the best summary statistics in your write up.

Shape: Bimodal! (skewed Left?)  
 Center: Median = 48 (Mean = 32.80)  
 Spread: IQR = 52 (SD = 22.67)  
 Outliers: None

8. (4) In our Retired "Calendar Year 2016 Large Survey" dataset, argue if "Gun Ownership" and "Politics" are independent or dependent variables. Support with conditional percentages. Make a concluding remark about the two variables.

	NO POLITICS		YES POLITICS	
Dependent:				
Less	27.46%	28.77%	33.58%	29.33%
More	28.17%	27.66%	42.54%	45.33%
Unsure	44.37%	43.57%	23.88%	25.33%

Yes, we see a 10% diff., so dep.

Retired.

- 9a. (4) Use our "Calendar Year 2016 Grocery Prices" to calculate the fences for "Wal Mart Price". Show your calculations.

$$LF = Q_1 - 1.5(IQR) = 1.91 - 1.5(2.07) = -1.195$$

$$UF = Q_3 + 1.5(IQR) = 3.98 + 1.5(2.07) = 7.085$$

- 9b. (2) How many low-valued outliers are in the dataset for "Wal Mart Price"? 0

How many high-valued outliers are in the dataset "Wal Mart Price"? 2

10. (10) Use the "US News National University Rankings" dataset.  
Report your answers as  $54 / 67 = 0.8060 = 80.60\%$ .

- 10a. Percentage of all schools that are from "Texas".

$$21/280 = 0.075 = 7.5\%$$

- 10b. Percentage of "Texas" schools that are "Private".

$$5/21 = 0.2381 = 23.81\%$$

- 10c. Percentage of "Private" schools that are from "Texas".

$$5/107 = 0.0467 = 4.67\%$$

- 10d. Percentage of all schools with "Enrollment" exceeding 15,000.

$$155/267 = 0.5805 = 58.05\%$$

- 10e. Percentage of all schools with "6yr Grad rate" under 80%.

$$204/275 = 0.7418 = 74.18\%$$

11. Use the "Maryland Sewer Overflows" dataset on StatCrunch.

- 11a. (2) Find the maximum "Quantity in Gallons" for "Cecil County".

Report the "Overflow Case Number": 7795

- 11b. (2) Which "Zip Code" had the highest mean "Quantity in Gallons"?

Report the "Zip Code": 21504

- 11c. (2) What is the best measure of center and spread for "Garrett" county's "Quantity in Gallons"?

Center: Median = 2400

Spread: IQR = 9500