

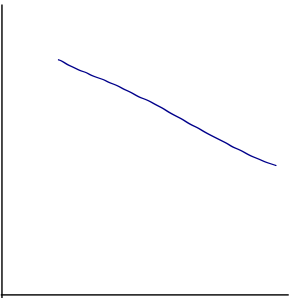
Pick Up
the Warm Up

I WARM UP

A

If a trend line has a downward direction, the relationship between the data topics can be described as a _____ Multiple choice

- A Negative Correlation
- B No Correlation
- C Positive Correlation
- D Undefined Correlation

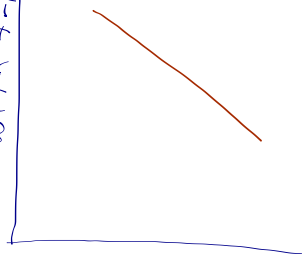


B

6 The amount of time you have to spend with friends and the number of chores you have to do would have a Multiple choice

- A Negative Correlation
- B No Correlation
- C Positive Correlation
- D Undefined Correlation

Amount of time available to spend with friend



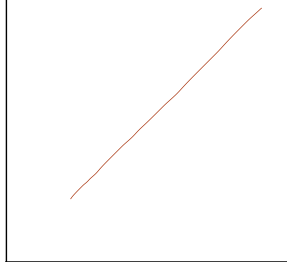
chores

C

7 The size of an animal and how much food it needs each day would have a Multiple choice

- A Negative Correlation
- B No Correlation
- C Undefined Correlation
- D Positive Correlation

Amount of food eaten



Animal size

D

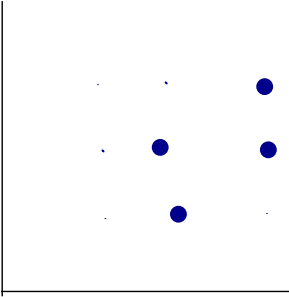
5 If a trend line cannot be drawn, the data topics can be described as having Multiple choice

A Negative Correlation

B No Correlation

C Positive Correlation

D Undefined Correlation




M19/5/MATSD/SP1/ENG/TZ1/XX

II

Money boxes are coin containers used by children and come in a variety of shapes. The money box shown is in the shape of a cylinder. It has a radius of 4.43 cm and a height of 12.2 cm.

diagram not to scale



(a) Find the volume of the money box. [3]

$$V = \pi r^2 h$$

$$V = \pi (4.43)^2 \times 12.2$$

$$= 752.171 \dots$$

$$= 752 \text{ cm}^3$$

A second money box is in the shape of a sphere and has the same volume as the cylindrical money box.

diagram not to scale

$$V = \frac{4}{3} \pi r^3$$



$$= 752.171 \dots$$

$$= 752 \text{ cm}^3$$

(b) Find the diameter of the second money box.

$$\frac{4}{3} \pi r^3 = 752.171 \dots$$

$$r^3 = \frac{3(752.171 \dots)}{4\pi}$$

$$r = 5.6416 \dots$$

$$2(\dots) = 11.283 \dots$$

$$= 11.3 \text{ cm}$$

Check HW
Solutions

1. Items on Tuesday's Unit Test
2. Questions on P3 ?
3. Practice LCQ on Correlation
3. Assignment:
Practice Problems for Tuesday's test

Unit 2 Test information- Statistical Applications

On the test, you can use:

- *Graphing Calculator*
- *IB Math Studies Formula Sheet*

You can write the following formulas on your IB Formula Sheet. Formulas for:

Correlation coefficient, covariance and LSRL, and the χ^2 statistic

- *On the actual IB exam you will not have access to the Calculator Basics, but I will let you have it out on this test just in case you need it.*

Data

Be able to enter data and make a scatter plot and make the appropriate choice for the independent variable if not given. Then make a sketch of this scatter plot with correct axis labels.

Correlation

- Estimate correlation coefficient, r , by viewing scatter plots.
- Find **Pearson's Product Moment Correlation Coefficient**, r , (*a.k.a. the linear correlation coefficient*)
 - a. Quickly by just entering raw data and using the calculator
 - b. find by formula, showing all critical totals
- Interpret **correlation** either from the coefficient OR by viewing scatter plots.
 - a) *Comment on both on strength and direction.*
 - b) *If there is a strong correlation then you must also have a 2nd summarizing statement that specifically mentions the variables. The 2nd statement should start out "As ____ increases,"*

LSRL

- Find the LSRL by entering raw data in your GDC and using the calculators capability to quickly produce the equation. Be able to transfer to a graph onto graph paper accurately and label the mean point, (\bar{x}, \bar{y}) . You must use a ruler !
- Find the LSRL in point slope form using the formula, show the covariance and the LSRL equation critical values.
- Be able to use the LSRL to make predictions and solve problems. Be conscious of whether the model is trustworthy or not (based on correlation and/or whether there is an interpolation or an extrapolation situation).

Chi-Square Test of Independence

Be able to follow the steps of the test, using both the X^2 statistic and probability.

You do not have to memorize the steps. You will be prompted with the steps and you just have to know how to use them.

Be sure you can make summary statements in the form shown in class and on the Sample X^2 packet (yellow).

Be sure to add the formulas for **Covariance** and the **LSRL** to your formula sheet.

Covariance

$$S_{xy} = \frac{\sum (x - \bar{x})(y - \bar{y})}{n}$$

LSRL

$$y - \bar{y} = \frac{s_{xy}}{(s_x)^2} (x - \bar{x})$$

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \times \sum (y_i - \bar{y})^2}}$$

\bar{x}
 s_x

Questions on
P3 ?

More thoughts
about the Coffee Shop
in London

Is there an association between age and spending?

ok
limiting

Are older people likely to spend more?

better

How might someone's occupation correlate to how much they spend at the coffee shop?



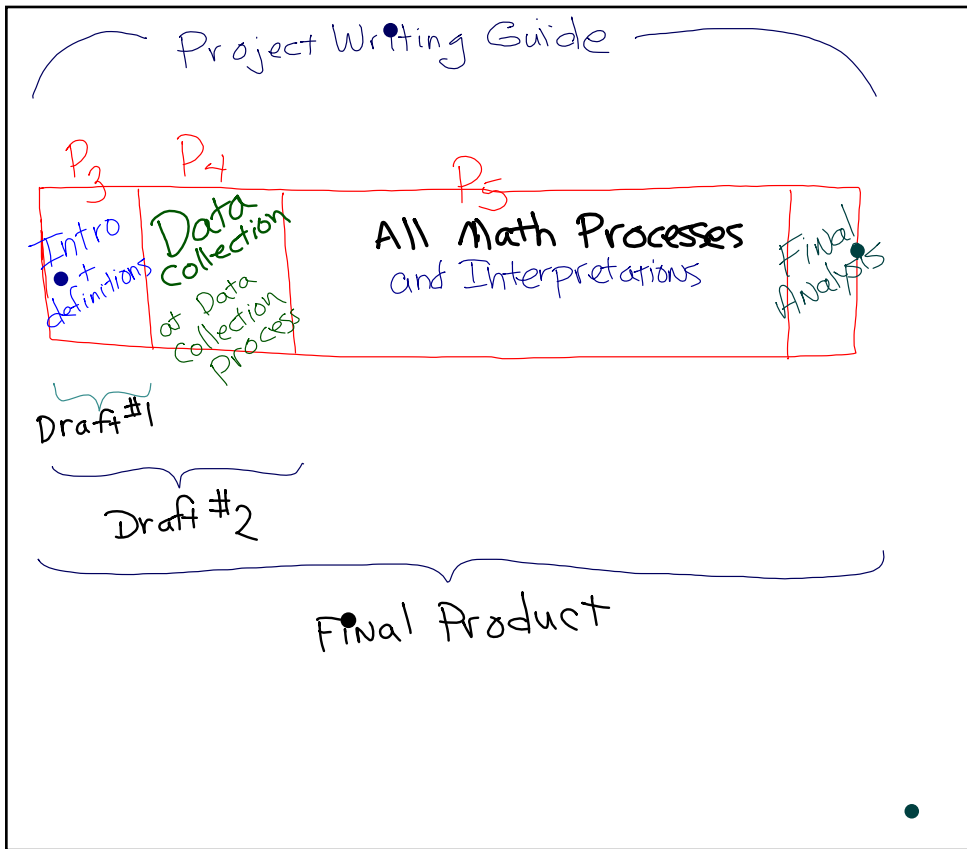
Is someone's occupation associated with how much they spend at the coffee shop?

At what times do customers spend the most money?

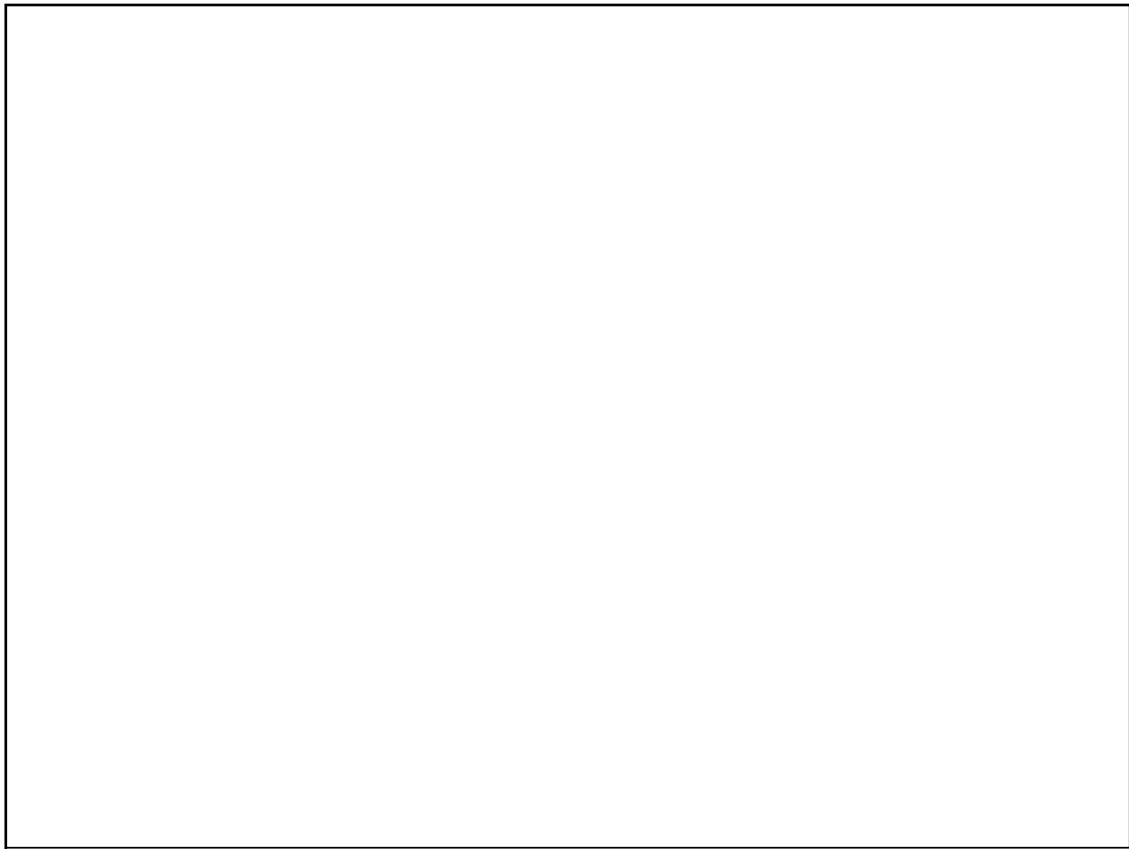
(and does age matter in that relationship?)

What are the factors that might determine how much one spends at a coffee shop in East London?

What are the factors that determine how long people hang out at a coffee shop in East London?



NGLCQ
|
Non-Graded



χ^2 TEST OF INDEPENDENCE
wording

We reject H_0 because...

We fail to reject H_0 because...

Assignment

p.341....4 (Use p-value, show entire process)

p.345....2 (Use X^2 but be careful. Be sure to make appropriate adjustments because it is a 2 by 2 table).

and..... Spend some significant time:

1. Thinking about your project and data you might collect.
2. Explore the links to data on the class website.
3. or think about how you can collect data of your own.