

## ALEKS...

- 30 minutes is NOT due this weekend, but the Monday you get back from spring break.
- (So basically this week and spring break are combined into one week of ALEKS)

Scatter Plots \& Lines of Best Fit 18

## Do you think there is a relationship between...

## Do you think there is a relationship between...

A person's high school GPA and their college GPA???


- A husband's age and a wife's age?



## Do you think there is a relationship between...

The length of the title of a movie and the amount of money it made?


## Do you think there is a relationship between...

The percentage of math homework assignments you do and your grade in the class???

I WILL MAKE A SCATTER PLOT AND SHOW YOU TOMORROW!!!

## Do you think there is a relationship between...

- The birth height of a boy and the month they were born?

- Scatter Plot - Shows the relationship between 2 variables
- Each "dot" is 1 piece of data
- The more dots you have, the more reliable conclusions you can draw from it!!!
- Examples - height vs shoe size
-Amount of time studying vs. test grade \# of hours of sleep and GPA
-Days left in school and temperature outside


## Types of Correlations

- Positive - the dots mostly increase from left to right
- Negative - the dots mostly decrease from left to right
- No correlation - there is no pattern

| Positive | Negative | No Correlation |
| :---: | :---: | :---: |
| I . | - | T |
| $\because$ | $\vec{\square}$ | * |
| - $\cdot \cdot$ | ${ }^{\prime} \cdot$ |  |
| . |  | -* . . . |
| 1, | $\because$ | - ${ }^{\text {- }}$ |
|  |  | 1: : : : : $: 1$ |

Positive - If one goes up, the other goes up. If one goes down, the other goes down.

Negative - If one goes up, the other goes down.

7 Which scatterplot displays a negative relationship over the entire set of data?



D


38 The graphs show the student envolliment at a school from 2004 dirough 2011 . Which graph
bert thow a negative correlation between the number of students and the years from 2004
Student



## STRONG vs. WEAK Correlation...

- Besides positive/negative, you can also judge a scatter plot based on how strong the correlation is.


## Created by: Mr. Lischw Warmup 3/(XXIX)

1) Find the equation of the line in the form $y=m x+b$.

2) What kind of correlation do you expect in our height vs. shoe size scatter plot? (Positive, negative, or no correlation? Strong, moderate, or weak?) Explain why you chose what you chose.

A positive or negative correlation is characterised by a straight line A positive or negative correlation is characterised by a straight line
with a positive/negative gradient. The strength of the correlation with a positive negative gradient. The strength of the corres
depends on the spread of points around the imagined line.

Strong Positive


Strong negative
Moderate Negative Moderate Negative

## What kind of correlation would you expect?

- height vs shoe size
- Amount of food you have eaten and how hungry you are
- Amount of time studying vs. test grade
- \# of hours of sleep and GPA
- Days left in school in the springtime and temperature outside
- \# of letters in your first name and \# of letters in your last name

\% of HW assignment done vs. grade in this class ( $3^{\text {rd }} 9$ weeks)





## Clusters and Outliers

- Cluster - a bunch of points grouped together indicates common values
- Outliers - values that are far away from the general pattern



## Line of Best Fit

## Line of Best Fit Application

- A line that goes through the middle of the data
- Should have about the same number of dots above and below it


$$
y=\frac{6}{5} x
$$

- What does the slope mean???

- The plants grow about 6 centimeters every 5 weeks

OR

- The plants grow about 6/5 centimeters in one week


The scatterplot below shows the relationship between the test grades for 10 students and the numbers of hours they studied per week.


Based on the scatterplot, which is the best prediction of the test grade for a student who studied for 7 hours?

F $98 \%$
C $91 \%$
H $88 \%$
J $82 \%$

## What is the slope, and what does it mean?



- Slope is about 1.5 .
- Your grade would be expected to go up 1.5 percent for each hour spent studying.

NO HOMEWORK

