

Lesson 4: Exploring Two Columns

Overview

Students will practice making conclusions from charts and learn to use the Data Visualizer in App Lab to make create two different kinds of charts, a cross tab, and a scatterplot. Students will practice reading each type of chart before learning to make them in the Data Visualizer. Students will track their work using a provided activity guide. The lesson concludes with a review of key takeaways.

Purpose

This lesson introduces students to two new ways of make visualizations in the Data Visualizer. The crosstab and scatter chart are new in that they allow students to see patterns across multiple variables, noticing how one might seem to change (or correlate) with another. This is good preparation for their unit project in which they'll need to make and interpret a data visualization of their own.

Standards

Full Course Alignment

CSP Conceptual Framework

- **DAT-2** - Programs can be used to process data, which allows users to discover information and create new knowledge.

CSTA K-12 Computer Science Standards (2017)

- **DA** - Data & Analysis

Agenda

Warm Up (5 minutes)

Activity (30 minutes)

Reading Crosstab Charts
Making Crosstab Charts
Reading Scatter Charts
Making Scatter Charts

Wrap Up (10 minutes)

Teaching Guide

Objectives

Students will be able to:

- Create a crosstab and scatter charts in App Lab's Data Visualizer
- Draw conclusions by reading crosstab and scatter charts
- Explain the reasons that someone would create either a crosstab and scatter chart in order to explore two columns of data

Preparation

- Review how to make crosstab and scatter charts in the Data Visualizer

Links

Heads Up! Please make a copy of any documents you plan to share with students.


For the teachers

- **CSP Unit 9 - Data** - Slides

For the students

- **Data Visualizer in App Lab - Part 2** - Video
- **Exploring Two Columns** - Activity Guide


Warm Up (5 minutes)

 **Discuss:** *Imagine you wanted to know which hour of the day you and your classmates are happiest. What kind of data would you collect? How do you think you'd analyze it?*

Have students brainstorm silently on their own, then have them share with neighbors, and finally have them share out with the room.


Discussion Goal: This discussion should preview the idea that students will need to collect multiple pieces of information about both the time of day and how happy people are. Beyond highlighting that fact there's no particular direction this conversation needs to go.

Remarks

 We just heard a lot of really interesting ideas here and they should make for some fascinating analysis. The main thing I noticed though, is that we need at least two different pieces of information. The time of day, and how happy people are. That means we're going to need to start thinking about ways to analyze more than one column of data. Today we're going to start looking at two different ways to do that

Activity (30 minutes)

Reading Crosstab Charts

 **Discuss:** *How many "Herding" breeds live a maximum of 12 years? What is the most common maximum life span for "Working" breeds? Which breed group lives the shortest? Which breed group lives the longest? How do you know? How confident are you in your answers?*

Also, run a short discussion and help students read the chart together. They will hopefully note the following:

- 4 herding breeds live a maximum of 12 years
- The most common maximum lifespan of working breeds is 12 years
- Toy breeds seem to live the longest
- Working breeds seem to be the shortest
- Students can see the spread of life expectancies for different breeds but it's not cut and dry.

 **Display:** Show the following slide introducing cross tab charts and how they work.

Teaching Tip

Understanding Crosstab: Give students some time to think and discuss why a crosstab chart might be a good choice for finding patterns like the ones indicated on this slide. Further reinforce the fact that if either column has too many values you may end up with an enormous chart.

Making Crosstab Charts

 Watch the video **Data Visualizer in App Lab - Part 2**

 **Distribute:** Give students access to **Exploring Two Columns**, ideally in digital form.

Teaching Tip

Fill Out the Activity Guide Digitally: The Data Visualizer allows students to quickly copy and paste visuals into documents and slide shows. If at all possible in your classroom environment, have students complete this activity guide digitally.

Do This: Have students go to the data visualizer and use both the "Words" and the "Favorite Classes" data sets to complete page 1 of the Activity Guide.

Discuss: Optionally have students share their progress and discuss the conclusions they reached on side one of the activity guide.

Reading Scatter Charts

Discuss: *Is there a pattern? How can you tell?*

Have students share whether they think there's pattern between the order in which states were admitted and their size.

Discussion Goal: Students will hopefully notice later states are relatively larger than earlier added ones. The trend does not necessarily reflect any causation, but there is a slight uptick in state size as more are added.

Display: Show the following slide introducing scatter charts and how they work.

Making Scatter Charts

Have students fill in page 2 of their activity guides practicing making scatter charts.

Discuss: *Have students share our their responses and talk through their conclusions.*

 1-2

Crosstab and Scatter Charts

1

2

 3

What Type of Chart?

Wrap Up (10 minutes)

Review: Review the three slides of the key takeaways and hit on the following points.

- Students know a lot of different ways to find patterns in data
- Review the chart showing how the can decide the type of visualization to create
- Have students record key takeaways in their journal

Assessment: Check For Understanding

Check For Understanding Question(s) and solutions can be found in each lesson on Code Studio. These questions can be used for an exit ticket.

Question: How are the questions you can investigate with scatter or crosstab charts different from the ones you can investigate with bar charts or histograms?

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Check For Understanding