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Unit 4 Assessment

Unit 4. Data Acquisition

Revision Date: Jun 22, 2019
Duration: 1 50-minute session

Lesson Summary

Pre-Lesson Preparation: Students need to have already chosen a topic and had it approved by the instructor. Students can use the following sources to help choose a data set:

http://www.data.gov/ (http://www.data.gov/) , http://data.princeton.edu/wws509/datasets (http://data.princeton.edu/wws509/datasets) , http://www.statsci.org/datasets.html (http://www.statsci.org/datasets.html)

Summary:

This lesson is the summative assessment for Unit 4 on Data Analysis.   Students will select a data set and write a small Python program to analyze the data. Students will then write a summary of their findings to demonstrate understanding of the data analysis process.

Outcomes:

- This unit assessment is designed to provide more practice in project based-work to prepare students for the final performance project at the end of this class.

Overview:

1. Getting Started (5 min) - Overview of task for the day.
2. Independent Activity (40 min) - Individually or in pairs, students collect and analyze data on their topic.
3. Wrap Up (5 min) - Overview of homework goals and expectations.
4. Homework: Individual two-page summary about their findings.

Learning Objectives

Math Common Core Practice:

- MP1: Make sense of problems and persevere in solving them.

- MP2: Reason abstractly and quantitatively.
- MP3: Construct viable arguments and critique the reasoning of others.
- MP4: Model with mathematics.
- MP5: Use appropriate tools strategically.
- MP6: Attend to precision.
- MP7: Look for and make use of structure.

Common Core Math:

- S-ID.1-4: Summarize, represent, and interpret data on a single count or measurement variable
- S-ID.5-6: Summarize, represent, and interpret data on two categorical and quantitative variables
- S-ID.7-9: Interpret linear models
- S-IC.3-6: Make inferences and justify conclusions from sample surveys, experiments and observational studies

Common Core ELA:

- RST 12.3 - Precisely follow a complex multistep procedure
- WHST 12.5 - Develop and strengthen writing as needed by planning, revising, editing, rewriting
- WHST 12.6 - Use technology, including the Internet, to produce, publish, and update writing products
- WHST 12.7 - Conduct short as well as more sustained research projects to answer a question

NGSS Practices:

- 1. Asking questions (for science) and defining problems (for engineering)
- 2. Developing and using models
- 3. Planning and carrying out investigations
- 4. Analyzing and interpreting data
- 5. Using mathematics and computational thinking

Key Concepts

Students will demonstrate their understanding of the process of collecting and evaluating data.

Essential Questions

- How can computation be employed to help people process data and information to gain insight and knowledge?
- How can computation be employed to facilitate exploration and discovery when working with data?
- What opportunities do large data sets provide for solving problems and creating knowledge?
- How are algorithms implemented and executed on computers and computational devices?
- How are algorithms evaluated?

- How are programs developed to help people, organizations or society solve problems?
- How are programs used for creative expression, to satisfy personal curiosity or to create new knowledge?
- How do computer programs implement algorithms?
- How do people develop and test computer programs?
- Which mathematical and logical concepts are fundamental to computer programming?

Teacher Resources

Student computer usage for this lesson is: **required**

> Rubric provided on Google Drive - Rubric - Unit 4 Summative Assessment.htm in the lesson folder.

Lesson Plan

Getting Started (5 min)

Verify that every student has selected a topic (approved by the instructor in advance) and address what the goal is for today.

Independent Activity (40 min)

Students will either individually or in pairs (instructor's decision) create a small program that reads data from a file, analyzes it, creates a simple simulation and finally writes data to a file.

Wrap Up (5 min)

Presentation about the expectations of the homework assignments.

Homework

Each student should create a 2-page typed summary that explains the following areas:

- The chosen data
- Why the data topic was chosen
- The analysis process
- The results of the analysis process
- The coding process used for data analysis

Options for Differentiated Instruction

Instructor has the option to have students work individually or in pairs for this assessment.

Evidence of Learning

Formative Assessment

Review Rubric with class and clarify expectations.

Summative Assessment

Students will be assigned a unit project, with a topic of their choice, to demonstrate their understanding and mastery of the concepts of data collection and analysis.

(http://www.umbc.edu/) (http://www.umd.edu/)

(http://www.nsf.gov/)

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