Tempo and Danceability

Integrating Data and Computing Competencies in Mathematics

Competency 1: Problem Posing and Problem-Solving Processes	Students define a problem or question, identify the steps necessary to address it, make an attempt to answer it using tools, reflect on the process, decide on next steps, and iterate.
Competency 2: Producing and Working with Data	Students can both produce data and assess data quality, organize and prepare data for a variety of purposes, and explore and visualize data to begin to answer a question or problem.
Competency 3: Abstraction, Algorithmic Thinking, and Automation	Students deepen their skills of abstraction and logical reasoning to design and express solutions to problems in a systematic, step-by- step way, and to explore concepts and methods of automating data and computing processes.
Competency 4: Probabilistic and Inferential Reasoning	Students identify sources of variability and uncertainty, develop probabilistic understanding, carry out statistical investigations and inference using formal testing procedures, and interpret and generalize results as appropriate .
Competency 5: Models and Representations	Students construct and reason with models and representations to explore phenomena and solve problems. They choose appropriate models for the situation and data available, assess the limitations of models and repre sentations, and recognize the uncertainty inherent in any modeling activity.
Competency 6: Technology and Society	Students recognize, anticipate, and address tensions related to technology and society, values, ethics, and responsibilities.
Competency 7: Data and Computing Systems	Students develop deeper awareness of how data and computing tools and systems can help to solve complex problems.

In this lesson, students will…

- Work with the data set Top_50, containing information on the top 50 songs of 2019 on Spotify.
- Decide what explanatory variables might be correlated with the outcome variable of “Danceability.” (Competencies 1 and 2)
- Use R coding language in a Jupyter notebook to create visualizations and best-fitting models to test their hypotheses. (Competency 5)
- Interpret the parameters of their models in the context of the problem. (Competency 3)
- Use Null Hypothesis Significance Testing to decide whether their hypothesis have statistical significance and could be used as a model of the population. (Competency 4)
- Realize overall how computers and technology are used in the real world to solve complex problems (Competency 7)