### **Data Identification and Collection**

### **Duration: 1 Week**

### **Summary**

This lesson covers aspects of data collection on the Internet. It focuses on the Google services of Search (general data gathering), Web Analytics (gathering data about website visitors), and Google Forms (gathering data as surveys of people). Searching includes coverage of first-order logic that is used by Google in its search queries. In addition to the concept of data collection it provides practical tutorials on good Google searching, search engine optimization, installing and doing analysis with Google Analytics, and creating Google forms.

The reading provides an overview on the Data Big Idea. The video lectures cover the skills of good Google Searching, Google Analytics, and Google forms.

The assignment has the student do Google searches, using meta search symbols and Advanced Search, for sources for their Impact of Innovation project. They turn in the search query they used for evaluation on understanding effective searching. The student also installs Google Analytics on their website (analysis is done in the next lesson). They also create a Google Form to collect survey data about their Impact of Innovation project topic from friends/family.

### **Learning Objectives**

* Explain how the Google Search Engine works.
* Perform good Google searches using first-order logic.
* Describe how Google Searching facilitates discovery of data.
* Explain what Google Analytics is and how it relates to the idea of Big Data.
* Install Google Analytics on a website and collect data.
* Describe how the Google Analytics interface filters data, clusters and classifies it, and facilitates answering questions about the data.
* Describe how Google Analytics transforms and translates data to gain insight and knowledge.
* Explain how Google Analytics data can be analyzed to make decisions.
* Describe how Google Analytics uses visualizations to communicate insights gained from data.
* Analyze how data representation, storage, security, and transmission of data involve computational manipulation of information.
* Perform data collection on the Internet using Google Forms.
* Extract information from data to discover and explain connections, patterns, or trends, such as with Google Trends. [AP CSP P1, LO 3.2.1]
* Explain what a database is and how it is used.

### **Course Material**

* Watch: [Big Data](https://www.youtube.com/watch?v=9vGR3VaFxJM) [14:10]
* Read: [Data and Its Analysis](http://computing-concepts.cs.uri.edu/index.php/Data_and_Its_Analysis)
* Watch: [How Google Search Works](https://www.youtube.com/watch?v=BNHR6IQJGZs) [3:14]
* Watch: [Google Advanced Search](https://www.youtube.com/watch?v=yzH1oYA4Gv0) [2:45]
* Watch: [Google Trends](https://www.youtube.com/watch?v=i7cTEJELlFM) [6:15]
* Watch: [Google Search Trends - Flu Analysis](https://www.youtube.com/watch?v=6111nS66Dpk) [2:10]
* Read: [Blown To Bits - Chapter 4 (Needles in the Haystack)](http://www.bitsbook.com/wp-content/uploads/2008/12/chapter4.pdf)
* Watch: [Google Analytics: The What, The Why, The How](https://www.youtube.com/watch?v=opwrGPKcfYw) [2:15]
* Watch: [Google Analytics: Real-Time Reports](https://www.youtube.com/watch?v=5zY7m5s4SPU) [0:33]
* Watch: [How to Read Google Analytics Reports](https://www.youtube.com/watch?v=cZi44oLBAd8) [3:35]
* Watch: [Google Analytics: Behavior Reports](https://www.youtube.com/watch?v=bfk17cV9xXk) [1:33]
* Watch: [Google Analytics: Audience Reports](https://www.youtube.com/watch?v=JyPMoKri4nc) [0:28]
* Watch: [Google Analytics: Content Reports](https://www.youtube.com/watch?v=YHBwEdgoAUI) [1:33]
* Watch: [Google Analytics: Traffic Sources Report](https://www.youtube.com/watch?v=0N3acFD_51s) [1:36]
* Watch: [Google Forms](https://www.youtube.com/watch?v=IzgaUOW6GIs) [1:59]

### **Assessments**

* Conceptual Quiz:
  + [Data Collection](https://docs.google.com/document/d/1WllZN0Vltk5Zb4_2SW5Jw6aDowPvLWYWXx49ZylCF9s/edit?usp=sharing) (requires access)
* Practical Assignment:
  + [Data Identification and Collection](https://drive.google.com/open?id=1ixYRkkZFH0-Pe_D-rPLBuGlzxYVi2b9itYwRpyHhbp8) | [Grading Rubric](https://drive.google.com/open?id=1_tYbiJk4LNAIBP83glVr-7ggweZm9e5tfZT2ThurGEA) | [Answer Key](https://docs.google.com/document/d/1XeyrAztbJY3YxOoe1V29lkhQmvUdToxCU3jgxlOV9bw/edit?usp=sharing)
  + [BB Ch 4: Needles in the Haystack](https://drive.google.com/open?id=11nNC-rnVUQCpL1dvS5E6NhH37SNnRQVNwpjuQUNSSZg)