### **Compression**

### **Duration: 1 Week**

### **Summary**

Compression of data is when the size of the data is reduced by using computing to store binary representations of the original binary data, such as patterns in the original data, instead of all of the original data. The lesson teaches about lossless and lossy compression. The video introduces compression in media. The assignment has students perform a dictionary-based lossless text compression algorithm.

### **Learning Objectives**

* Analyze how data representation, storage, security, and transmission of data involve computational manipulation of information. [AP CSP P4, LO 3.3.1]
* Define lossless and lossy compression.
* Explain the tradeoff that compression algorithms make in size of the data and quality of the data.
* Perform a dictionary-based lossless text compression algorithm.

### **Course Material**

* Watch: [Data Compression](https://www.youtube.com/watch?v=LCGkcn1f-ms) [5:51]
* Read: [Data Compression](http://computing-concepts.cs.uri.edu/index.php/Compression)
* Watch: [Hexadecimal and File Signatures](https://www.youtube.com/watch?v=jf1Rz9AFk7I&feature=youtu.be) [23:11]
  + [Slide PDF](http://homepage.cs.uri.edu/~thenry/csc414/08_File_Signatures_TOC.pdf)

### **In Class**

* Optional: [Text Compression Unplugged](http://csunplugged.org/text-compression/)

### **Assessments:**

* Conceptual Quiz:
  + [Compression](https://docs.google.com/document/d/17URbrlvGIOW-Lhi4LepS9knOKmObPPuxYmn3sYEC2do/edit?usp=sharing) (requires access)
* Practical Assignment:
  + [Data Compression](https://drive.google.com/open?id=1-yiILP5WADBAOdVQYhPZrzO7x-iu5u00DXxjfriXVUU) | [Grading Rubric](https://drive.google.com/open?id=1wPFGU5xolDg2Di7vgdDr2BMOcXVjwqXUVZf2MY9N8DY) | [Answer Key](https://docs.google.com/document/d/1ZsLAcJnz_dAnbytzz9vEnlMK3w_7VU0SBFQgv5FDHI0/edit?usp=sharing)