MAT 616 Spring 2022

Math, Science and Data Science notes 2/15/2022

1. In what way does Mathematics "make sense"? Let's agree that anything that can be classified as True or False makes sense. Among the things that make sense, some are deemed to be true by some and false by others. Including sources and references in your writing helps clarify things.

2. Mathematics is a body of knowledge that is built by using assumed statements and rules to derive other (i.e. derived) statements. This type of cognitive object is called a formal language (in contrast with the natural language we use everry day, e.g. English). Mathematics can be applied to practical problems, but the underlying theory is NOT supposed to be associated to anything else than the abstract cognitive reality. The Mathematics formal language is cumbersome, so it has become customary to talk about Mathematics in an informal manner.

3. Science is a method or way that leads to the discovery of facts that can be verified by others. There is a lot of history and literature about the nature of science. Thomas Kunn's work is an excellent source of information about science.

4. Data Science is a relatively new field that seeks to obtain information from data using both mathematical tools (i.e. asssumptions and rules of deduction) and scientific methods. Computer Science tools and methods provide both the lab environment (i.e. computers) and the subjects in which to do experiments (i.e. data stored in physical devices).

5. Modern tools in Data Science seem to diverge from traditional Science in many ways. The following is a (debatable) comparison:

Science	Data Science
Analytic human intelligence	Algorithmic computing intelligence
Search for truth	Search for value
Scientist centric	Crowd centric
Driven by ideas in scientific journals	Driven by demand in industry
Math language is fundamental	Story telling is fundamental