Unit 1 (Intro) Videos

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Metacognition

- Metacognition essentially means "thinking about thinking".
- You need to be honest and be honest with yourself on whether you're learning or not.
- You need to start early, by staying ahead of the teacher, which generally means you do well.
- Engage - paying attention in class, showing your interest in learning about what the teacher is saying.
- Teach - you'll never really learn the material until you teach it to somebody else.
    - For example, teach your mom or spouse about a topic, or by creating a wiki or document where you become an expert on it.
- Study Often - if you want to see information again and again, you are less likely to forget it.
- Self-evaluate - you have to evaluate yourself every step of the way:
    - Take quizzes
    - Take Practice Tests
    - Write Questions that you then answer
    - Write essays
- VARK
    - V: Visual
    - A: Aural
    - R: Reading and Writing
    - K: Kinesthetic
- Take a Break - rather than studying for an hour with no breaks, study for a half hour then taking a 10 minute break
- Have fun - Make a study group, make a funny song/video.
- Set a goal - push through constantly, and there are going to be setbacks the whole time.

Babbage's Difference Engine

- Charles Babbage was the son of a tyrannical London Banker, who was a bully at home.
- His money kept him set for life.
    - He attended Cambridge, where he studied Mathematics.
- Charles became an iconoclastic writer and habitual inventor.
- In 1832, he showcased a small section of his difference engine, a far-from finished device that aimed to revolutionize calculation by mechanizing it.
    - By pushing a handle, Babbage could perform polynomial calculations, which were repeatable and error-free. It was also automatic.
    - However, this section was all he ever finished.
- Babbage had moved on to a new project that would make the abandoned machine obsolete.
    - This Analytical engine would be a general-purpose calculating automaton.
    - For 30 years, he revised and perfected the design. Only a few sections were ever built, one of which after his death by his son.
    - The Analytical engine was an ever-evolving machine, each breakthrough drawn and annotated, with a coding system Babbage referred to as his finest invention.
    - The Analytical engine may be the most complex mechanical system ever realized with paper and pencil alone.
- In 1846, Babbage abruptly decided to draw up schematics for Difference Engine #2, which would require 1000 parts, one-third as many as the first.
    - He offered it to the government, who declined to build it, and he put the drawings away, where they eventually came to the Library of the Science Museum in London.
    - In 1985, the museum's curator of computing, became convinced to build Difference Engine #2, which took 17 years.
        - It works just as designed.
    - In 2008, a clone of the machine was built and shipped to California, where it was placed in the Computer History Museum.