Introduction to Digital Logic

- Switches, Transistors, Gates

Doug Shook

Review Questions

- Describe the principle of abstraction. How does it help us when talking about digital logic?
- Describe the principles of hierarchy, modularity, and regularity.
- Give examples of hierarchy, modularity, and regularity.
- Describe the roles of voltage, current, and resistance in an electrical system.

Review Questions

- Explain the difference between digital and analog.
- Explain why computers use digital circuits instead of analog circuits.
- Why do computers use the binary system?
- How does the idea of a switch apply to digital circuits?
- Describe the different types of switches discussed in the video. Which type does a computer rely on? Why?

Review Questions

- Describe what transistors are made out of and how they are made.
- How does an NMOS transistor differ from a PMOS transistor?
- Describe the operation of a PMOS transistor.

Review Questions

- Write the truth table for XOR
- Draw a circuit that is equivalent to XOR using only AND, OR and NOT.
  - Bonus: use only AND and NOT
- Describe what pull up and pull down networks are.
- Using NMOS and PMOS transistors, draw a circuit for an OR gate.
- Using NMOS and PMOS transistors, draw a circuit for an XOR gate.

Review Questions

- Gates are not limited to one or two inputs. Using NMOS and PMOS transistors, draw a circuit that represents a 4-input AND. Such a gate would return 1 only if all four inputs are 1.

- Draw the truth table and circuit for a 3 input OR gate.