The Generations of Computers

▶ The development of computers started with mechanical and electro mechanical devices (17th through 19th century) and has progressed

▶ through four generations of computers

Mechanical Devices

- One of the earliest mechanical calculating devices was the Pascaline ,
- invented in 1642 by the French philosopher and mathematician
- Blaise Pascal. The Pascaline was a complicated set of gears that operated
- similarly to a clock. It was designed to only perform addition.
- Unfortunately, due to manufacturing problems, Pascal never got the
- device to work properly
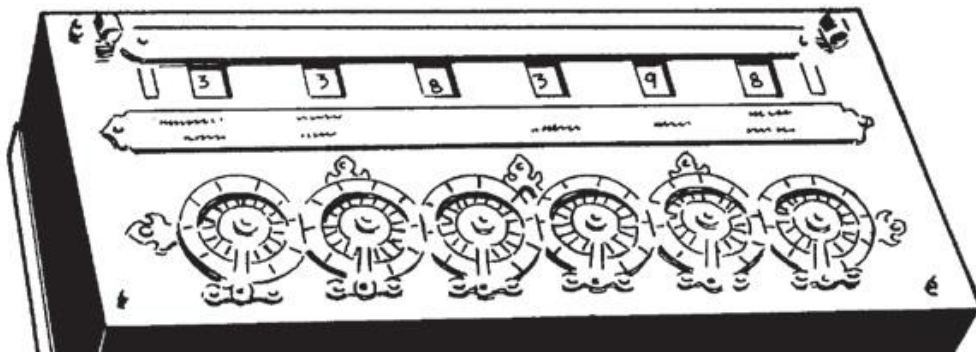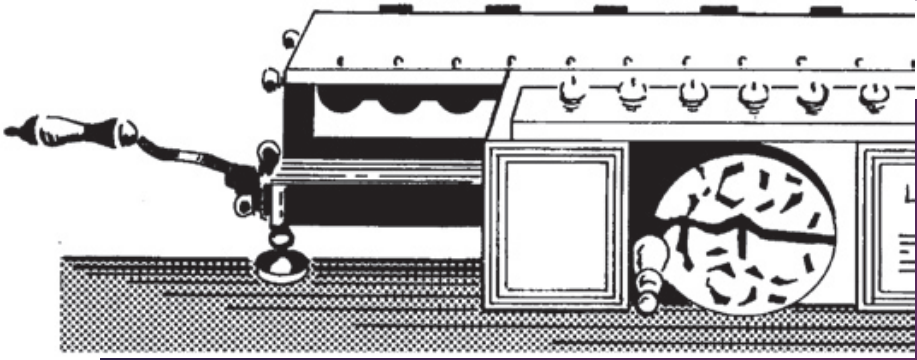
First Generation Computers

- These first generation computers continued to use many vacuum
- tubes which made them large and expensive. They were so expensive
- to purchase and run that only the largest corporations and the U.S.
- government could afford them. Their ability to perform up to 1,000
- calculations per second, however, made them popular. The first electronic computer was built between 1939 and 1942 at
- Iowa State University by John Atanasoff, a math and physics professor,
- and Clifford Berry, a graduate student. The Atanasoff-Berry Computer
- (ABC) used the binary number system of 1s and 0s that is still used in
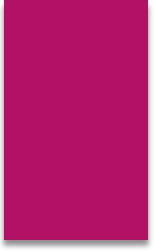- computers today.

Second Generation Computers

▶ In 1947, William Shockley, John Bardeen, and Walter Brittain of Bell

▶ Laboratories invented the transistor. A transistor is a semiconductor

▶ device that could replace a vacuum tube. Transistors were much

▶ smaller than vacuum tubes, less expensive, and allowed computer to

▶ process up to 10,000 calculations per second: In the early 1960s, IBM introduced the first medium-sized computer

▶ named the Model 650. It was expensive, but much smaller than first

▶ generation computers and still capable of handling the flood of paperwork

▶ produced by many government agencies and businesses

Third Generation Computers

- The use of integrated circuits (ICs) began the third generation of
- computers. In 1961, Jack Kilby and Robert Noyce, working independently,
- developed the IC, also called a chip. Hundreds of transistors,
- as well as other electronic components and wiring could be housed
- within a single IC, which allowed computers to process information
- at a rate of millions of calculations per second.
- ICs are created from silicon wafers which are then etched with
- intricate circuits and then coated with a metallic oxide to allow the
- circuits to conduct electricity. The silicon wafers are housed in special
- plastic cases that have metal pins. The pins allow the ICs to be plugged
- into circuit boards that have wiring printed on them.

Fourth Generation of Computers

- In 1970, Marcian Hoff, an engineer at Intel Corporation, invented
- the microprocessor, an entire CPU on a single chip. The replacement
- of several larger components by one microprocessor made possible
- the fourth generation of computers.
- The small microprocessor made it possible to build a computer
- called a microcomputer, which was small enough to fit on a desktop.
- The first of these was the Altair built in 1975. In 1976, Stephen Wozniak
- and Steven Jobs designed and built the first Apple computer. The
- Apple Macintosh set new standards for ease of computer use with
- its graphical user interface. In 1981, IBM introduced the IBM–PC. The
- computer was an instant success because of the availability of spreadsheet,
- accounting, and word processor software. Desktop computers
- are referred to as either PCs or Macs.

Advances in technology made personal computers inexpensive and
therefore available to many people. Because of these advances almost
anyone could own a machine that had more computing power and
was faster and more reliable than either the ENIAC or UNIVAC. As a
comparison, if the cost of a sports car had dropped as quickly as that
of a computer, a new Porsche would now cost about one dollar.
Fifth-generation of computers are still in development and are based
on artifical intelligence