Assignment no 1
CSc101-Introduction to ICT

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Assignment statement:

Q1: Write down the Basic features or functionality of the Some Well Known Early computers.

- The Mark I Computer (1937-44)
- The Atanasoff-Berry Computer (1939-42)
- The ENIAC (1943-46)
- The EDVAC (1946-52)
- The EDSAC (1947-49)
- Manchester Mark I (1948)
- The UNIVAC I (1951)

Earlier computers:

Computer is an electronic device that inputs data, performs operations, gives output ,stores data and communicates. Computer is a programming device that has evolved through different generations.Thecomputer we are using today is fairly a recent invention .
There are basically different generations of computer having their different features and functionalites which are discuss below.

1.The Mark I Computer (1937-44):

A programmable, electromechanical calculator designed by Professor Howard Aiken. Built by IBM and installed at Harvard in 1944, the Mark I's 765,000 parts were used to string 78 adding machines together.

Features of Mark I Computer:

- The Mark I had 60 sets of 24 switches for data entry and could store 72 numbers, each 23 decimal digits long. It could do 3 additions or subtractions in a second. A multiplication took 6 seconds, a division took 15.3 seconds, and a logarithm or a trigonometric function took over one minute.
- A long horizontal rotating shaft provided power for the operation of these components.
- It is the example of first generation computer which was developed as the first fully manual computer of that era

Functions of Mark I Computer:

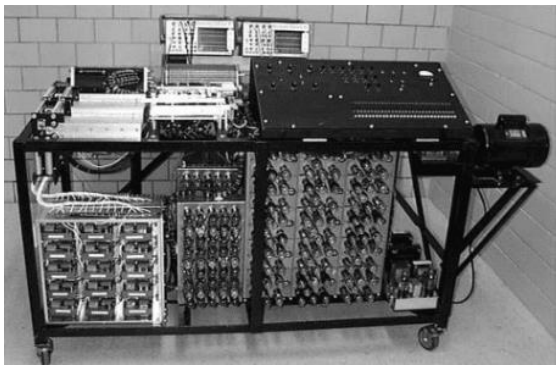
- Mark I worked around the clock on military projects, calculating massive mathematical tables. It helped the Navy by computing tables for the design of equipment such as underwater detection systems.
- It help in calculating the design of camera lenses, radar, and implosion devices for the atomic bomb.
- It is a electromechanical computer which was used in the war effort during the last part of World War II.

The Atanasoff-Berry Computer (1939-42):

The first automatic electronic digital computer. Limited by the technology of the day, and execution, the device has remained somewhat obscure. It was designed to solve systems of simultaneous linear equations, which were a common problem in physics and engineering.

Features of Atanasoff-Berry Computer:

- It is featured as 300 vacuum tubes for control and arithmetic calculations, use of binary numbers, logic operations, memory capacitors, and punched cards as input/output units.
- This electronic components is used to store and process data in binary form.
- And this binary arithmetic uses only two digits (0 and 1), which perform calculations.



Functions of Atanasoff-Berry Computer:

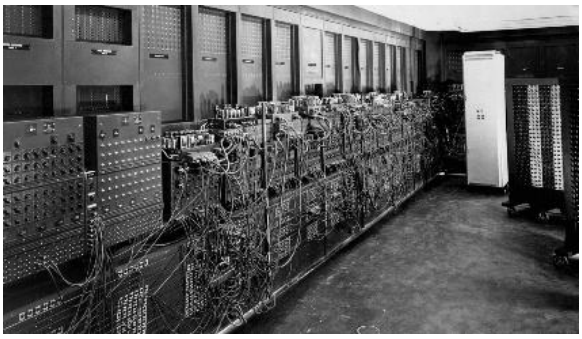
- It is used to input data in the form of binary digits using switches**.**
- It is used as a type of memory based on capacitors, which allowed it to store data electronically.
- It was used to solve systems of simultaneous linear equations using a method known as the Gauss-Jordan elimination algorithm. This involved performing a series of arithmetic operations on the equations to transform them into an equivalent system with a unique solution.

The ENIAC (1943-46):

ENIAC (Electronic Numerical Integrator and Computer) was the world's first general-purpose computer. ENIAC was designed and built for the United States Army to calculate artillery firing tables. However, it was ENIAC's power and general-purpose programmability that excited the public's imagination.

Features of ENIAC (1943-46):

- It is the first electronic computer, using electronic components, such as vacuum tubes, diodes, and capacitors, to perform calculations, and it was a significant departure from previous computers, which used mechanical or electromechanical components.
- It was programmed using a plugboard and switches.
- It was a very fast computer, capable of performing around 5,000 additions per second. This made it well-suited for tasks such as calculations.



Functions of ENIAC (1943-46):

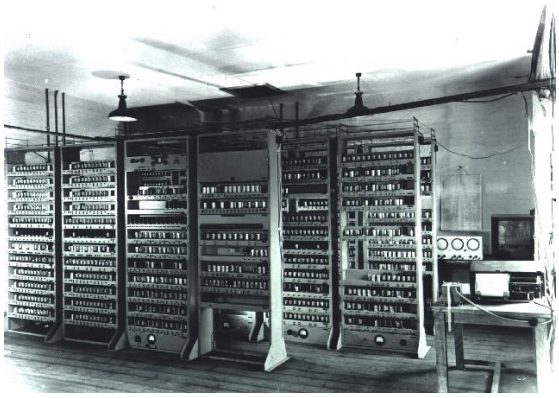
- The ENIAC was initially designed to calculate firing tables for artillery. The ENIAC was able to perform these calculations much faster and with greater accuracy.
- It was also used to study atmospheric conditions and predict weather patterns. It was important for military operations, as weather have a impact on the completion of a mission.
- It was also used in nuclear explosions and to develop the hydrogen bomb in the wars.
- It was a valuable tool for both military and scientific research.

The EDVAC (1946-52):

EDVAC (Electronic Discrete Variable Automatic Computer) was one of the earliest large mainframe computers to be built in the 1940s. It was the first mainframe computer that represented binary systems rather than decimal systems.

Features of EDVAC (1946-52):

- It was the first computer to use electronic memory instead of mechanical or electro-mechanical memory devices. It used a random access memory (RAM) consisting of 512 words, with each word being 44 bits long.
- It use a stored program, where both the data and instructions were stored in the same memory. This execute a series of instructions automatically without human interaction.
- It had a serial processing computer,that it processed data one bit at a time, which allowed for faster processing speeds and more accurate calculations.
- It considered a high-speed computer for its time, with a clock speed of 1 MHz, with small size



Functions of EDVAC (1946-52):

- It was designed for data processing, including mathematical calculations and scientific simulations.
- It used magnetic tape as a storage medium to store both programs and data. This allowed for easy and efficient access to stored information.
- It was capable of performing complex arithmetic and logic operations, including addition, subtraction, multiplication, and division.
- It was used for testing and verifying the design of other computers and electronic circuits, including error-checking capabilities to detect and correct errors in its calculations.

The EDSAC (1947-49):

EDSAC (Electronic Delay Storage Automatic Calculator) the first full-size stored-program computer, to provide a formal computing service for users. The second electronic digital stored-program computer to go into regular service.

Features of EDSAC (1947-49):

- It was vacuum tube technology, which allowed for fast speeds and more reliable operation, stored program computer in same memory so it can be used easily and be modified easily.
- It is high-speed computer for its time, with a clock speed of around 500 kHz, also having small size and compact compared to other computers of its time.
- Having paper tape as a storage medium for programs and data.

Functions of EDSAC (1947-49):

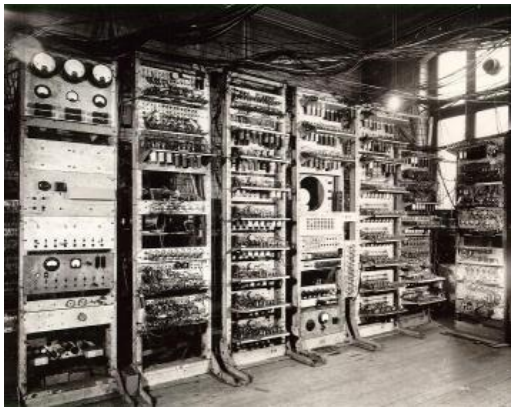
- It was capable of performing complex arithmetic and logic operations, including addition, subtraction, multiplication, and division.
- It accept input from a variety of sources, including paper tape and punched cards and give output data to a teleprinter, which allowed for the results of calculations to be printed.
- It primarily designed for data processing, including mathematical calculations and scientific simulations, and also with delay line memory system to store both programs and data. This allowed for efficient access to stored information.
- It was programmed using assembly language, which involved writing programs using machine instructions.

Manchester Mark I (1948):

The Manchester Mark 1 was one of the earliest stored-program computers.

Features of Manchester Mark I (1948):

- It based on two double-density Williams-Kilburn Tubes as main store, each with the capacity of two page.
- The two-level store and instruction modification registers (which soon evolved into index registers). A magnetic drum was added to provide a random-access secondary storage device.
- Mark I was enourmous in size. It weighed 5 tons, used 530 miles of wire different large number of separate parts. The operation of these parts was powered by a long horizontal rotating shaft. A four horsepower engine drives the mechanical parts.



Functions of Manchester Mark I (1948):

- Its primary function was to perform calculations. It was capable of performing mathematical operations such as addition, subtraction, multiplication, and division.
- The computer could store and retrieve data on a magnetic drum, which was the primary form of storage for the Manchester Mark I.
- It control external devices, such as printers and card readers, through its input/output parts.
- It is also used to built-in debugging capabilities, which allowed programmers to identify and correct errors in their code.

The UNIVAC I (1951):

The UNIVAC I (Universal Automatic Computer I) was the first general-purpose electronic digital computer design for business application produced in the United States. It helped user in the era of modern computing. It was used for a wide range of applications, including scientific research, military operations, and business management.

Features of The UNIVAC I (1951):

- It was designed as a commercial data-processing computer, to replace the punched-card accounting machines of the day, which read 7,200 decimal digits per second, making it the fastest business machine yet built.
- Having magnetic tape for data storage. Magnetic tape allowed for large storage as compared to punched card.
- Equipped with several input/output devices, including card readers, printers, and paper-tape readers. These devices allowed users to input and output data quickly and efficiently.

Functions of The UNIVAC I (1951):

- It was designed for data processing, such as performing mathematical calculations and storing and retrieving data.
- It was also used for scientific research, such as modeling weather patterns and analyze atomic energy data,in military operations .
- It was used for business applications, such as accounting and payroll processing and accounting, inventory management, and sales analysis.
- It was a powerful and versatile computer that was used for a wide range of applications, having impact on computing and data processing.