Name: Manvi Gupta Roll No: B17092

Computer Organisation Assignment 4
History of Computers

In simple words, a machine is defined as, anything which makes our lives easier. The modern machines we see today are a result of years of research and hard work put in by different people. The computer is no different. It is a programmable electronic unit which can store and process information. Let's dive deeper into how it all started.

The Abacus was the first machine humans created for counting and calculating. It started as early as 500 BC when people realized that a machine could be used to perform their complex calculations in a comparatively faster and efficient way. It eventually evolved to a mechanical adding device, Pascaline, developed by Blaise Pascal. It was only limited to addition and subtraction and was too costly. But the machine broke often and could be fixed only by its inventor, thus, wasn't a success. In the late 1600s, Gottfried Wilhelm Leibniz created the second calculator which could perform many different operations like addition, subtraction, multiplication, division and finding square roots. It required manual power to run. In 1801, Jacquard loom was invented. It was a weaving machine that used punched cards. The earliest known mechanical analog computer was the Antikythera mechanism used to calculate astronomical positions.

A calculator is a device which makes calculations easier and faster but requires a human operator to perform the tasks. On the other hand, a computer can be programmed to do all the calculations by following a set of instructions automatically. Calculators devised into computers as people started making more efficient and programmable calculators.

A revolutionary change was made in the history of computers when Charles Babbage designed the first Analytical Machine which he called the Difference Engine. It was an early computer which also used the concept of punched cards introduced by Jacquard. Augusta Ada Byron suggested him to use the Binary system. She also wrote programmes for the analytical engine. Due to some political issues, Babbage could not complete the machine but presented his complete design and idea theoretically. Later on, the engine was completed by his son along with a team of engineers. It had the components of input, memory, processor and an output. This made his invention stand out among the rest and formed the basis of today's fastest computers. It was almost a century ahead of its time.

Most of the computing needs were met by analog computers which were mainly electronic or mechanical devices. The 20th century gave another pivotal contributor named Alan Turing. He studied how computers process information and proposed a simple device which he called the "Universal Computing Machine" or the Turing Machine. He claimed that the machine was capable of performing all the tasks which can be fed into the computer as a set of instructions, thus making it programmable. Today, he is

best known for the “Turing Test”, which is used to find out if a computer is intelligent enough to hold a plausible conversation with humans. Today, Alan Turing is regarded as the “father of modern computer science”.

The first Electronic programmable computer was the ENIAC(Electronic Numerical Integrator and Computer) built in the US. It was fast and Turing-Complete. It was way more efficient than all the devices existing at that time. It could perform around 5000 addition/subtraction operations per second. And perform all the basic mathematical computations. He stored the data on magnetic tapes. ENIAC was one of the first generations of computers. With Turing, came the era of modern computers. Von Neumann realized that all the modern computer was solely based on the concept of Turing’s paper of storing all the information as a set of instructions. All modern machines are said to be Turing-complete.

Another benchmark in the history of computers was the integrated circuit. The first mobile computers were really heavy and required mains to run. As technology advanced, the memory units started becoming compact and portable. We came all the way from big room-sized systems to a pocket mobile phone. The microprocessor we use today was introduced with the Intel 4004 in 1968. It eventually developed as a single chip microprocessor by 1970. This led to the development of microcomputers.

In around 1976, Steve Jobs started Apple in his father’s garage. Their Lisa was the first computer with a GUI. It was also the first computer with a single circuit board. This was the first operating system, Macintosh. The world was left spellbound when Steve Jobs launched it as the first machine which had a human-friendly display, audio facility and could fit inside a box leaving behind IBM. By 1980, Apple had become a big company by launching its own IPO. After a few years, Microsoft released its first version of Windows but it was a big failure. Finally, IBM and Apple came together in 1991 to make PowerPC-based computers.

Till then, the world wide web had not come into the scene. Though the “dot com” domain had already been registered. It was only in 1990 that Tim Berners Lee, along with his team, developed the HyperText Markup Language(HTML) giving birth to, what we call today, the World Wide Web. The most widely used, Google Search Engine was developed by Larry Page and Sergey Brin at Stanford University. As the internet spread, people started wanting to have a wireless connection which they could carry anywhere. Eventually, around 1999, Wi-Fi, which completes our lives today, was introduced.

This way the computers progressed. And what we see today, is a result of so much hard work and dedication put in by some of the greatest minds of the world who have made our lives so simpler. Today, as a student, for me, it's hard to imagine my life without the internet. All the information, it seems, is just one click away. From ordering your favorite food to traveling the world, the computer has made it all so easy. Smartphones have become more of a necessity than a luxury. The complete timeline of computers needs to be appreciated as of how people thought of the ideas of the computer as a mechanical device, eventually automating the things to make our lives easier.

Future of Computers

In my opinion, the future of computers is going to be really fascinating. The day is not far when you would be talking to a humanoid for your daily chores or maybe asking him to cook your favorite food for you. With a blink of an eye, you would escape into a virtual world. There would be no need of having to go to a place physically. Vehicles would drive themselves on their own. We would be able to interact with computers as we do with our friends.

As the field of Artificial Intelligence is growing, the machines shall become even smarter, replacing humans in every field. From handling big data to making important decisions in multinational companies, they can do it all. People are also coming up with quantum computers and nanotechnology. The computers would be fitted into the eye lens. We might come up with the technology which can help the handicapped to control their PCs. It is also devised that we would be able to have a 3-dimensional view of the person just through a video call.

Computers would have human emotions and gestures. They would be able to react to situations in a similar way as we do. Or maybe take much better decisions than us. We basically are aiming to create a replica human brains. Schools will be teaching this subject from the very beginning so that the young minds have a gist of the technological advances.

To conclude, the future of computers is going to be something really great, which we might not be able to think of right now. Humans shall be replaced by machines called humanoids in almost all the fields. But it has been an awesome journey from the abacus to smartphones, so we can hope to have many efficient machines in the coming years. Who knows, the future kids might never be introduced to the paperback books!!