

CS2022 ASSIGNMENT 3 (Due Date: Sep 23, 2022)

Instructions: This assignment consists of two parts. Part I consists of twenty questions about the BBC documentary. Part II consists of five questions about the content in the lecture note on the history of computer. You have to answer all of them. Put your answers in a MS WORD file, or other word processing file, and then submit the file to the course Gmail account.

1 Part I: BBC Documentary

1. After World War II, Alan Turing was involved in the design of a stored-program computer based on his conceptual model introduced in 1930s. What is the name of this computer?

Answer: Automatic Computing Engine (ACE).

2. What is the title of the paper in which Alan Turing presented the idea of computing machines (i.e. the conceptual model of a computer)?

Answer: The title of the paper is *On computable numbers, with an application to the Entscheidungsproblem*. It was published in 1936 in the *Journal of Mathematics*.

Turing, A.M., On computable numbers, with an application to the Entscheidungsproblem. *Journal of Mathematics*, Vol.58, pp. 345-363, 1936.

Note that the word Entscheidungsproblem is German. In English, it means decision problem.

3. The work done by Alan Turing in code breaking during the World War II was kept in secret for decades. Around in which year, his contribution in WWII was disclosed?

Answer: 1970s.

4. What was the cause of the death of Alan Turing in 1954?

Answer: He committed suicide.

5. After WWII, John Mauchly and J. Presper Eckert in US started a venture on making commercial computers. However, people were skeptic on this. In the video, two skeptical reasons have been mentioned. What are they?

Answer: (1) The machine was made out of large numbers of vacuum tubes also these tubes were prone to burning out. (2) The machines complexity to make a computer was not an easy task, it required an understanding of very advanced mathematics.

6. John Mauchly and J. Presper Eckert named the computer to be made the UNIVAC. What is the full name of this machine?

Answer: Universal Automatic Computer (UNIVAC).

7. In UK, the first commercial computer was designed and built by a company called Lyon. What businesses Lyon was famous for?

Answer: Lyon was a chain-stored tea shop.

8. In 1947, Lyon got experts from academic to design and build the computer. From which university, the Lyon got the experts?

Answer: Cambridge University.

9. In which year, Lyon started a new product line called "Computers"?

Answer: 1954.

10. In US, Eckert-Mauchly Computer was finally sold to Remington Rand. A new division under Remington Rand was created to continue on the Eckert and Mauchly computer project. What is the name of this new division?

Answer: Eckert-Mauchy Division.

11. In which year, UNIVAC was used for the prediction of the outcome of the US president election?

Answer: 1952.

12. By the end of 1953, how many UNIVAC machines had been installed?

Answer: 3.

13. What are the social effects of computers in factory and office automation?

Answer: (1) Computer was able to improve the productivity of a firm. (2) Many works were replaced by computer. So, many workers were lay-off.

14. When did Apple design her first computer?

Answer: 1976.

15. When was the device 'mouse' designed and who designed it?

Answer: In 1960s, a device called 'mouse' was designed by Douglas Engelbart who was a scholar in the Stanford Research Institute (SRI).

16. Why Xerox did not make computer?

Answer: As Xerox major business was in photo copying machine, the public might not believe that a photo copying machine manufacturer was able to make a good computer.

17. What is ALTAIR 8800 and when did it appear in the market?

Answer: ALTAIR 8800 is a microcomputer embedded with microprocessor. It appears in the market in 1975.

18. When did IBM design her first personal computer?

Answer: 1981.

19. Apart from expensive pricing, what other factor led the first generation of IBM PC fail in the market?

Answer: It is not user-friendly. User needed to key-in text commands for using the computer. User always needed to look-up the manual for a command for the use of the computer.

20. What is the key feature of Macintosh making it very difference from other PCs appeared in 1984?

Answer: User could command the operating system via a user-friendly environment – a graphical user interface with a mouse – instead of based on text command.

2 History of Computers (in the PPT slides and in the lecture)

1. Babbage Difference Machine was built for solving what kind of problems?

Answer: To calculate the values of a continuous function $f(x)$ for x in a range $a \leq x \leq b$.

2. With reference to the lecture slides, what major inventions or technological advancements led to the realizations of the first, second, third and fourth generations of computers?

Answer: 1G: Vacuum Tubes. 2G: Semiconductor Transistors. 3G: Integrated circuit (IC). 4G: Microprocessors.

3. State the evolution of the methods of controlling an operating system from the fifth to the seventh generation of computers.

Answer: 5G: Text command. 6G: Text command and GUI-based command. 7G: Text command, GUI-based command and voice command.

4. State the names of two conceptual models of computer which were proposed in the earlier 20th century.

Answer: Turing machine and von Neumann model.

5. Today, almost all computers their architectures follow one of these conceptual models. Which one is it?

Answer: von Neumann model.