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From Sebesta Chapter 2 review questions: Questions 2, 5, 6 through 11, 14, 15, 20 through 25, 36, 37, 46, 51, 52, 57, 59, and 60.

2. What two common data structures were included in Plankalkül?

– Plankalkül included **arrays** and **records (structs)** as common data structures

5. Why was the slowness of interpretation of programs acceptable in the early 1950s?

– The slowness of interpretation was acceptable because early computers lacked **floating-point hardware** and **indexing**, meaning most computational time was spent simulating these features in software. This made the overhead of interpretation relatively insignificant.

6. What hardware capability that first appeared in the IBM 704 computer strongly affected the evolution of programming languages? Explain why

– The IBM 704 was the first computer to include **hardware floating-point arithmetic and indexing**, which significantly improved computational efficiency. This allowed languages like **Fortran** to evolve, focusing on **high-level abstraction** while still producing efficient compiled code.

11. What control flow statements were added to Fortran IV to get Fortran 77?

– **IF-THEN-ELSE** constructs.
– **DO loops** with control variables
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14. Why were linguists interested in artificial intelligence in the late 1950s?

– Linguists were interested in AI because they saw its potential for **natural language processing (NLP)**, enabling computers to understand and generate human language

15. Where was Lisp developed? By whom?

– **Lisp** was developed at **MIT** by **John McCarthy** in **1958.**

20. What missing language element of ALGOL 60 damaged its chances for widespread use?

- The **lack of standardized I/O (Input/Output) facilities** made ALGOL 60 difficult to use in practical applications, limiting its adoption.

21. What language was designed to describe the syntax of ALGOL 60?

- Backus-Naur Form (BNF)

22. On what programming language was COBOL based?

- COBOL was based on **FLOW-MATIC.**

23. In what year did the COBOL design process begin?

- in **1959.**

24. What data structure that appeared in COBOL originated with Plankalkül?

- The **record (struct-like) data structure** used in COBOL originated from **Plankalkül**

25. What organization was most responsible for the early success of COBOL (in terms of extent of use)?

- The **U.S. Department of Defense (DoD).**

36. What is a nonprocedural language?

- A **nonprocedural language** (declarative language) specifies **what** should be done rather than **how** to do it. The execution logic is handled by the system.
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37. What are the two kinds of statements that populate a Prolog database?

- **Facts** – Declare relationships
- **Rules** – Define logical conditions

46. What was the first application for Java?

- Java was first used for **interactive television** but gained prominence with **web applets** in browsers.

51. For what application area is JavaScript most widely used?

- **JavaScript** is primarily used for **client-side web development**, enabling dynamic content in web browsers.

52. What is the relationship between JavaScript and PHP, in terms of their use?

- **JavaScript** is used for **client-side scripting** (runs in the browser).
- **PHP** is used for **server-side scripting** (runs on the server).

57. What deficiency of the switch statement of C is addressed with the changes made by C# to that statement?

- the `switch` statement:
  - Allows **string cases**.
  - Does **not fall through** by default, unlike **C**, which requires `break` statements.

59. What are the inputs to an XSLT processor?

- **An XML document** (input data).
- **An XSLT stylesheet** (transformation rules) .

60. What is the output of an XSLT processor?

- A transformed **XML document, HTML file, or plain text file** based on the given XSLT stylesheet.