

2.2. Which of these are well-formed lists? That is, which ones have

properly balanced parentheses?

(A B (C) -- Missing parentheses at the end. Not well-formed.

((A) (B)) -- Well-formed

A B)(C D) -- Wrong order of parentheses. Not well-formed

(A (B (C)) -- No closing parentheses. Not well-formed

(A (B (C))) -- Well-formed

((A) (B)) (C)) -- Well-formed

2.4

((BOWS (ARROWS)) (FLOWERS (CHOCOLATES)))

2.6

() is for NIL

(()) is for (NIL)

(()) is for ((NIL))

(()) is for (NIL NIL)

() (()) is for (NIL(NIL))

2.13

Write down tables similar to the one above to illustrate how to get to

each word in the list (((FUN)) (IN THE) (SUN))

Table for FUN

Step. Result.

start (((FUN)) (IN THE)(SUN))

CAAR ((FUN))

CAAAR (FUN)

CAAAAR FUN

Table for IN

Step. Result.

CADR ((IN THE)(SUN))

CAADR (IN THE)

CAAADR IN

Table for THE

Step. Result.

CADR ((IN THE)(SUN))

CAADR (IN THE)

CDAADR THE

Table for SUN

Step. Result.

CADR ((IN THE)(SUN))

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CDADR (SUN)
CADADR SUN
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2.15 Using the list ((A B) (C D) (E F)), fill in the missing parts of this table.

Function	--	Result
CAR	--	(A B)
CDDR	--	((E F))
CADR	--	(C D)
CDAR	--	(B)
CADAR	--	B
CDDAR	--	()
CAAR	--	A
CDADDR	--	(F)
CADADR	--	F

2.16. What does CAAR do when given the input (FRED NIL)?
It will most likely be an error because it will try to take the CAR of an (FRED). But FRED is an atom.

Sebesta Chapter 1 questions.

6. In what language is most of UNIX written?
Unix is written in C programming language

7. What is the disadvantage of having too many features in a language?
It can be really complex, and hard to read. Having many features can also make it hard to learn the language.

8. How can user-defined operator overloading harm the readability of a program?
Inconsistency and maintenance could be difficult.

9. What is one example of a lack of orthogonality in the design of C?
That the arrays and pointers are closely related, but they are not interchangeable.

10. What language used orthogonality as a primary design criterion?
ALGOL 68

11. What primitive control statement is used to build more complicated control statements in languages that lack them?
The "goto"

12. What does it mean for a program to be reliable?
It means that the program is easy to read, it is consistent, has minimal or no bugs at all.

13. Why is type checking the parameters of a subprogram important?
It catches the errors, and prevents type related bugs.

14. What is aliasing?
When more than two different identifiers refer to the same memory location.

15. What is exception handling?
This is a feature that deals with runtime errors and exceptional conditions.

16. Why is readability important to writability?
Because overtime the code will need to be modified, and understood by others, code that can be reused makes it easier to spot bugs and errors.

20. What are the three fundamental features of an object-oriented programming language?
The main three features are Encapsulation, Inheritance, Polymorphism.

21. What language was the first to support the three fundamental features of object-oriented programming?
Simula

22. What is an example of two language design criteria that are in direct conflict with each other?
Readability and writability

23. What are the three general methods of implementing a programming language?
Compilation, pure Interpretation, and Hybrid Implementation.

24. Which produces faster program execution, a compiler or a pure interpreter?

A compiler would have faster program execution.

25. What role does the symbol table play in a compiler?

This is a data structure used by a compiler to store information about the symbols in the source code.

29. What are the advantages in implementing a language with a pure interpreter?

It directly executes source code without compiling it into machine code.