Questions from the Lisp text

2.2 “Which of these are well-formed lists? That is, which ones have properly balanced parentheses?”

(A B (C) Not balanced
((A) (B)) Balanced
A B)(C D) Not balanced
(A (B (C)) Not balanced
(A (B (C))) Balanced
(((A) (B)) (C)) Balanced

2.4 “What is the parenthesis notation for this cons cell structure?”

((Bows Arrows)(Flowers Chocalates))

2.6 “Match each list on the left with a corresponding list on the right by substituting NIL for ( ) wherever possible. Pay careful attention to levels of parameterization.”

- () == NIL
- (()) == (NIL)
- ((())) == ((NIL))
- (() ()) == (NIL NIL)
- (() ((()))) == (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))”

Step	Result
C..AR	((FUN)) (IN THE) (SUN)
C.AAR	(FUN)
CAAAR	FUN

Step	Result
C…AR	((FUN)) (IN THE) (SUN)
C..DAR	(IN THE) (SUN)
C.ADAR	(IN THE)
CAADAR	IN

Step	Result
C…AR	((FUN)) (IN THE) (SUN)
C..DAR	(IN THE) (SUN)
C.ADAR	(IN THE)
CDADAR	THE

Step	Result
C…AR	((FUN)) (IN THE) (SUN)
C..DAR	(IN THE) (SUN)
C.DDAR	(SUN)
CDDDAR	SUN

2.15 “Using the list ((A B) (C D) (E F)), fill in the missing parts”

Function	Result
CAR	(A B)
CDDR	(E F)
CADR	(C D)
CDAR	B
CDAAR	NIL
CDDAR	NIL
CAAR	A
CDADDR	NIL
CDDDR	F

2.16 “What does CAAR do when given the input (FRED NIL)?”

Return FRED

Problems from the Sebesta text

6. “In what language is most of UNIX written?”

C

7. “What is the disadvantage of having too many features in a language?”

The language becomes more difficult to learn

8. “How can user-defined operator overloading harm the readability of a program?”

It can become difficult to keep track of everything overloaded

9. “What is one example of a lack of orthogonality in the design of C?”

A member of a structure can be any data type except void or a structure of the same type.

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?”

Compound statements

12. “What does it mean for a program to be reliable?”

If the program can perform to its specifications under all conditions. The following subsections describe several language features that have a significant effect on the reliability of programs in a given language.

13. “Why is type checking the parameters of a subprogram important?”

To avoid program errors.

14. “What is aliasing?”

Aliasing is having two or more distinct names in a program that can be used to access the same memory cell.

15. “What is exception handling?”

The ability of a program to intercept run-time errors, take corrective measures, and then continue.

16. “Why is readability important to writability.”

Programs that are difficult to read are difficult both to write and to modify.

20. “What two programming language deficiencies were discovered as a result of the research in software development in the 1970s.”

Incompleteness of type checking and inadequacy of control statements.

25. “Which produces faster program execution, a compiler or a pure interpreter?”

A compiler produces faster program execution than a pure interpreter.

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

Pure interpretation has the advantage of allowing easy implementation of many source-level debugging operations, because all run-time error messages can refer to source-level units.