Homework 1 – Q1and2

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1.

2.2. properly balanced:
   ((A) (B))
   (A (B (C)))
   (((A) (B)) (C))

2.4. ((BOWS   ARROWS) (FLOWER   CHOCOLATES))

2.6.

6: (OPEN THE POD BAY DOORS HAL)

3: ((OPEN) (THE POD BAY DOORS) HAL)

4: ((1 2 3) (4 5 6) (7 8 9) (10 11 12))

4: ((ONE) FOR ALL (AND (TWO (FOR ME))))

5:((Q SPADES)
   (7 HEARTS)
   (6 CLUBS)
   (5 DIAMONDS)
   (2 DIAMONDS))

6: ((PENNSYLVANIA (THE KEYSTONE STATE))
   (NEW-JERSEY (THE GARDEN STATE))
   (MASSACHUSETTS (THE BAY STATE))
   (FLORIDA (THE SUNSHINE STATE))
   (NEW-YORK (THE EMPIRE STATE))
   (INDIANA (THE HOOSIER STATE)))

2.13.

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

C..ADR	((IN THE))
C.AADR	(IN)
CAAADR	IN

start	(((FUN)) (IN THE) (SUN))
C...DR	((IN THE) (SUN))
C..ADR	((IN THE))
C.DADR	(THE)
CADADR	THE

start	(((FUN)) (IN THE) (SUN))
C...DR	((IN THE) (SUN))
C..DDR	((SUN))
C.ADDR	SUN

2.15.

List: ((A B) (C D) (E F))

Function	Result
CAR	(A B)
CDDR	**(E F)**
CADR	**(C D)**
CDAR	**(B)**
CADAR	B
CDDAR	**ERROR**
CAAAR	A
CDADDR	**ERROR**
CADDDR	F

2.16. NIL

2.

6. Computer language C

7. Having too many features in a language increases the complexity, which can make it harder to learn, read and write.

8. User-defined operator overloading causes confusion regarding what the operator does.

9. Any exception to a rule is an example of a lack or orthogonality. For example in C, an element in an array can be any data type except a function or a void type.

10. ALGOL 68

11. goto statement

12. For a program to be reliable it does its specifications under all conditions

13. Type checking parameters is important because then it is much easier to find and fix errors.

14. Aliasing has two or more ways to access one memory cell in a program

15. Exception handling is a program's ability to interrupt run-time errors, correct them and continue.

16. Readability contributes to writability because you must be able to read a program before you can write one. Readability is also important to writability in maintaining programs because they are often updated by different people that wrote the original program who need to read it before they add or change the program.

20. incompleteness of type checking and inadequacy of control statements.

21. data abstraction, inheritance, and dynamic method binding

22. Smalltalk

23. Reliability and cost of execution

24. Compiler implementation when programs are directly translated to machine language. Pure interpretation is when a program is interpreted by and program interpreter that acts like a software simulation (no translating). Hybrid implementation system is a mix of the two prior implementations, it translates the program to be more easily interpreted.

25. A complier

29. A pure interpreter allows easy implementation of many source-level debugging operations