Kevin Gutierrez – CSCI 330 – Homework 2

Question 1:

3.1: NIL

3.2: (/ (+ 8 12) 2)

3.3: (+ (* 3 3) (* 4 4))

3.7:

(defun MILES-PER-GALLON (INITIAL-ODOMETER-READING FINAL-ODOMETER-READING GALLONS-CONSUMED)

(/ (- FINAL-ODOMETER-READING INITIAL-ODOMETER-READING) GALLONS-CONSUMED))

3.10:

(third (the quick brown fox)) **Error** -> input list is not quoted, should be

(third ‘(the quick brown fox))

(list 2 and 2 is 4) **Error** -> (2 and 2 is 4) should be quoted , should be

(list '(2 and 2 is 4))

(+ 1 ‘(length (list t t t t))) **Error** -> quote before length is not needed, should be

(+ 1 (length (list t t t t)))

(cons ‘patrick (seymour marvin)) **Error** -> list of seymour and marvin should be quoted, should be

(cons 'patrick '(seymour marvin))

(cons ‘patrick (list seymour marvin)) **Error** -> seymour and marvin should both have quotes, should be

(cons 'patrick (list 'seymour 'marvin))

3.20:

Output of (mystery ‘(dancing bear))

(BEAR DANCING)

Output of (mystery ‘dancing ‘bear)

dancing is an unbound var

Output of (mystery ‘(zowie))

(NIL ZOWIE)

Output of (mystery (list ‘first ‘second))

(SECOND FIRST)

3.21:

(defun speak (x y) (list ‘all ‘x ‘is ‘y)) **Problem** -> ‘x ‘y are being read literally and need to be referenced by using the variable name without an apostrophe

(defun speak (x) (y) (list ‘all x ‘is y)) **Problem** -> param list is not correct, should not be (x) (y)

3.25:

(list ‘cons t nil) evaluates to

(CONS T NIL)

(eval (list ‘cons t nil)) evaluates to

T

(eval (eval (list ‘cons t nil))) evaluates to

Fails to evaluate

(apply #’cons ‘(t nil)) evaluates to

(T)

(eval nil) evaluates to

NIL

(list ‘eval nil) evaluates to

(EVAL NIL)

(eval (list ‘eval nil)) evaluates to

NIL

Question 2

2. What two common data structures were included in Plankalkül? – Arrays and structs

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

6. What hardware capability that first appeared in the IBM 704 computer strongly affected the evolution of programming languages? Explain why. – Indexing and floating point hardware, which made programs much more efficient.

7. In what year was the Fortran design project begun? - 1952 (first version released was in 1957, called fortran 1)

8. What was the primary application area of computers at the time Fortran was designed? – Scientific computations

9. What was the source of all of the control flow statements of Fortran I? – 704 instructions

10. What was the most significant feature added to Fortran I to get Fortran II? – Independent compilation of subroutines

11. What control flow statements were added to Fortran IV to get Fortran 77? – If with optional else clause and logical loop control statements

14. Why were linguists interested in artificial intelligence in the late 1950s? – For natural language processing.

15. Where was Lisp developed? By whom? – MIT, by John McCarthy

20. What missing language element of ALGOL 60 damaged its chances for widespread use? – Lack of input and output statements

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

22. On what programming language was COBOL based? – FLOW-MATIC

23. In what year did the COBOL design process begin? - 1959

24. What data structure that appeared in COBOL originated with Plankalkül? – Hierarchical data structures, also known as records

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

36. What is a nonprocedural language? – A program that specifies what the program should accomplish and not how it should be accomplished

46. What was the first application for Java? – Embedded

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

52. What is the relationship between JavaScript and PHP, in terms of their use? - Web development, both are used for developing web applications

57. What deficiency of the switch statement of C is addressed with the changes made by C# to that statement? - The inability to use strings as case labels of switch statements

59. What are the inputs to an XSLT processor? – An XML data document and an XSLT document

60. What is the output of an XSLT processor? – The updated XML and XSLT documents, where XML doc data is templated and the transformations, defined in the XSLT document are used