Abel Asfaw **CSCI330 Hw2 QUESTION 1** **02/04/25**

3.1 (NOT (EQUAL 3 (ABS -3)))

(NOT(EQUAL 3 3)
(NOT T)
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)): **The** Unassigned Variable, Missing quote.
Corrected: (third '(the quick brown fox))
→(list 2 and 2 is 4) **2** Unassigned Variable, Missing quotes.
Corrected: (list '2 'and '2 'is '4)
→(+ 1 '(length (list t t t t))) Wrong input type for **+** and **t** Unassigned Variable, both missing quotes and misplaced quote before list.
Corrected: (+ 1 (length (list 't 't 't 't)))
→ (cons 'patrick (seymour marvin)) SEYMOUR Unassigned Variable, missing quote before list.
Corrected: (cons 'patrick '(seymour marvin))
→(cons 'patrick (list seymour marvin)) SEYMOUR Unbound Variable, missing quotes.
Corrected: (cons 'patrick (list 'seymour 'marvin))

3.20 → (mystery '(dancing bear)): (bear dancing)

```
MYSTERY
* (mystery '(dancing bear))

(BEAR DANCING)
```

→ (mystery 'dancing 'bear) **Error:** Too many Arguents

```
invalid number of arguments: 2
```

→ (mystery '(zowie)): (NIL zowie)

```
(NIL ZOWIE)
```

→ (mystery (list 'first 'second)): (second first)

```
(SECOND FIRST)
```

3.21 → (defun speak (x y) (list 'all 'x 'is 'y)): arguments have quotes in body, throwing a 'declared but not used' error.

→ (defun speak (x) (y) (list ’all x ’is y)): argument Y wont be recognized in the function definition in the body.

➔ (defun speak ((x) (y)) (list all ’x is ’y)): The arguments are not a symbol due to the double parenthesis on each, and if even if they were they have a quote in the body.

3.25 → (list ’cons t nil): (const t nil)

```
* (list 'cons t nil)

(CONS T NIL)
```

→ (eval (list ’cons t nil)): (t)

```
* (eval (list 'cons t nil))

(T)
```

→ (eval (eval (list ’cons t nil))): **Error**

```
* (eval (eval (list 'cons t nil)))
; in: T
;     (T)
;
; caught WARNING:
;   The function T is undefined, and its name is reserved by ANSI CL so that even
;   if it were defined later, the code doing so would not be portable.
;
; compilation unit finished
;   Undefined function:
;     T
```

→ (apply #’cons ’(t nil)): (t)

```
0] (apply #'cons '(t nil))

(T)
```

→ (eval nil): NIL

```
0] (eval nil)

NIL
```

→ (list ’eval nil): (eval nil)

```
NIL
0] (list 'eval nil)

(EVAL NIL)
```

→ (eval (list ’eval nil)): NIL

```
(eval (list 'eval nil))

NIL
```

Sebesta Chapter 2 Review Questions

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

   Plankalkül included arrays and records as its two common data structures.

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

   The slowness was acceptable because computers were extremely expensive, and maximizing their use was more important than execution speed. The convenience of higher-level programming made development easier and more efficient, even if execution was slower.

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 have hardware support for floating-point arithmetic, which made numerical computations much easier and influenced the development of languages like Fortran that focused on scientific computing.

7. In what year was the Fortran design project begun?

   The Fortran design project began in 1954.

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

   Fortran was designed primarily for scientific and engineering applications that required complex mathematical computations.

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

   The control flow statements of Fortran I were based on the assembly language of the IBM 704.

10. What was the most significant feature added to Fortran I to get Fortran II?

    Fortran II introduced the ability to define subroutines with independently compiled procedures.

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

    Fortran 77 introduced the IF-THEN-ELSE statement, making conditional execution more structured and readable.

14. Why were linguists interested in artificial intelligence in the late 1950s?

    Linguists were interested because AI research at the time focused on natural language processing and machine translation, which could help computers understand and generate human languages.

15. Where was Lisp developed? By whom?

    Lisp was developed at MIT by John McCarthy.

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

    ALGOL 60 lacked standardized input and output statements, making it difficult to use for practical applications.

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

    Backus-Naur Form (BNF) was designed to describe the syntax of ALGOL 60.

22. On what programming language was COBOL based?

    COBOL was influenced by the FLOW-MATIC language.

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

    The COBOL design process began in 1959.

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

    The record data structure 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 played a major role in promoting COBOL by requiring its use in government projects.

36. What is a nonprocedural language?

    A nonprocedural language is a programming language where the programmer specifies what needs to be done rather than explicitly defining the sequence of operations.

37. What are the two kinds of statements that populate a Prolog database?

    A Prolog database consists of facts and rules.

46. What was the first application for Java?

    Java was first designed for interactive television, but it was later adapted for internet applications.

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

    JavaScript is most widely used for web development, particularly for adding interactivity to web pages.

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

    JavaScript is primarily used for client-side scripting, while PHP is used for server-side scripting in web development.

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

    In C#, the switch statement requires explicit break statements to prevent fall-through behavior, reducing unintended errors.

59. What are the inputs to an XSLT processor?

    The inputs to an XSLT processor are an XML document and an XSLT stylesheet.

60. What is the output of an XSLT processor?

    The output of an XSLT processor is a transformed XML document, often converted into HTML or another format.

Thank You!!