Homework 2 Q2/Q1 Explanations

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From Sebesta Chapter 2 review questions: Questions 2, 5, 6 through 11, 14, 15, 20 through 25, 36, 37, 46, 51, 52, 57, 59, and 60

2. The two common data structures that were included in Plankalkul were the array and record.
5. The slowness of interpretation programs was acceptable in the early 1950s because of the lack of floating-point hardware in the available computers.
6. Its capabilities led to the development of Fortran because it was able to support floating-point operations hardware.
7. The Fortran design project began in May 1954.
8. Around the time Fortran was designed the primary application area of computers was mathematics
9. They were based on 704 instructions.
10. The most significant feature was the addition of independent compilation capability.
11. The control flow statements were logical loop statements and IF with an optional ELSE.
14. Linguists were concerned with the natural language processing
15. LISP was developed at MIT by John McCarthy.
20. There was a lack of input and output statements with formatting.
21. BNF
22. It's based on FLOW-MATIC
23. 1959
24. The hierarchical data structures (records).
25. Department of Defense
36. The non-procedural languages are concerned with the what not the how, you specify what conditions the answer should satisfy but not how to obtain it.
37. Facts and rules
46. MacOS/iOS Apple products
51. It differs because of the dynamic nature of its strings, and arrays, and its use of dynamic typing
52. Rectangular arrays
57. Lists, tuples, and dictionaries
59. All of the operations are called via method calls
60. Tables

Q1 Explanations

3.10 The following expressions all result in errors. Write down the type of error that occurs, explain how the error arose (for example, missing quote, quote in wrong place), and correct the expression by changing only the quotes

(third (the quick brown fox)) The error will be "the is an undefined function" its missing the ' it should be
(third '(the quick brown fox))

(list 2 and 2 is 4) The error will be “the variable AND is unbound” you need to add ‘ to and and is the correct way should be
(list 2 ‘and 2 ‘is 4)

(+ 1 ’(length (list t t t t))) Lisp will issue a type error since you are trying to add 1 to a list which you can't do, this one is fixed by removing the quote so it looks like
(+ 1 (length (list t t t t)))

(cons ’patrick (seymour marvin)) The error will be “undefined function SEYMOUR” since it's missing the quote before the second part, the correct way should be
(cons ‘patrick ‘(seymour marvin))

(cons ’patrick (list seymour marvin)) The error will be “variable SEYMOUR is unbound” because it’s missing the ‘. The correct way should be
(cons ‘patrick (list ‘seymour ‘marvin))

3.21 What is wrong with the following functions?

```
(defun speak (x y) (list ’all ’x ’is ’y))
```
The variable names shouldn't be quoted so the ‘x and ‘y need to be x and y.

```
(defun speak(x)(y)(list ’all x ’is y))
```
You can't have two argument lists it should be (x y) not (x) (y)

```
(defun speak((x)(y))(list all ’x is ’y))
```
You dont put parentheses around the variables in the argument list. The variables shouldnt be quoted again and there should be quotes around all and is so the correct way would look like
(defun speak (x y) (list ‘all x ‘is y))