

Compiler Program #4

Your final compiler task is to even further extend the Pascal0 compiler by introducing the ability to parse and generate the appropriate p-Code for the following constructs:

- Value parameters
- Reference parameters

Use your current version of the compiler (i.e. the one that you modified and turned in for Compiler Program #3). Any test files to run your compiler against are located on the Web site.

You must extend the last version of your compiler. You must use the given test data to test your compiler and to show that it can successfully parse and generate the p-Code. Please, please, please **comment your modifications to the compiler shell**. Place comments before your additions or modifications such as “begin added/modified” followed by your additions or modifications followed by “end added/modified”. **I will deduct points this time for failure to include noticeable comments!**

You must also create two additional Pascal0 programs to test your compiler against:

- Recursive Fibonacci function: write a full Pascal0 program that implements a function that computes the n -th item in a FIBONACCI series which can be called from the main procedure by, for example:

```
FOR A := 1 TO 19 DO
    WRITE(CALL FIBONACCI(A));
WRITELN(CALL FIBONACCI(A));
```

The output—in this case—would be:

```
Start PL/0
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181
End PL/0
```

- Recursive Towers of Hanoi procedure: write a full Pascal0 program that implements a HANOI procedure that can be called from the main procedure by, for example:

```
CALL HANOI(4,1,3,2);
```

The parameters—in this case—imply that the procedure perform the Towers of Hanoi with 4 discs, moving them from peg 1 to peg 3 using peg 2 as spare. The output should include the moves necessary to solve the problem; e.g.:

```
Start PL/0
```

```
1 2
1 3
2 3
1 2
3 1
3 2
1 2
1 3
2 3
2 1
3 1
2 3
1 2
1 3
2 3
End PL/0
```

Upload your modified compiler (I do not need the test case or compiler output) and the source of both of your Pascal0 programs (Fibonacci and Hanoi) using the upload facility on the Web site (please ZIP/TAR all files rather than send each individual file separately).