Homework 4

Programming Language Concepts

Due April 10, 2020

Name: _____

1. (points) Consider the following skeletal C program:

```
void fun1(void); /* prototype */
void fun2(void); /* prototype */
void fun3(void); /* prototype */

void main() {
   int a, b, c;
   . . .
}
void fun1(void) {
   int b, c, d;
   . . .
}
void fun2(void) {
   int c, d, e;
   . . .
}
void fun3(void) {
   int d, e, f;
   . . .
}
```

Given the following calling sequences and assuming that dynamic scoping is used, what variables are visible during execution of the last function called? Include with each visible variable the name of the function in which it was defined.

a. main calls fun1; fun1 calls fun2; fun2 calls fun3.

b. main calls fun1; fun1 calls fun3.

c. main calls fun2; fun2 calls fun3; fun3 calls fun1.

d. main calls fun3; fun3 calls fun1.

e. main calls fun1; fun1 calls fun3; fun3 calls fun2.

f. main calls fun3; fun3 calls fun2; fun2 calls fun1.

2. (points) Write a JavaScript script that has subprograms nested three deep and in which each nested subprogram references variables defined in all of its enclosing subprograms.

3. (points) Repeat exercise 2 with Python.

4. (points) Write an EBNF rule that describes the while statement of Java or C++. Write the recursive-descent subprogram in Java or C++ for this rule.

_____ 0 points