

Arizona State University  
CSE 340 – Spring 2018  
Homework 4  
**Due Saturday March 17 by 11:59 PM**

**I Static and Dynamic Scoping.** Consider the following program written in the C syntax.

```
int a, b, c, x, y, z;

void print(int p){
    if (p == 0)
        printf("f: %d %d %d %d %d\n", a, b, x, y, z);
    else if (p == 1)
        printf("g: %d %d %d %d %d\n", a, b, x, y, z);
    else if (p == 2)
        printf("main: %d %d %d %d %d\n", a, b, x, y, z);
}

int f(int x, int y)
{
    int a = 10;
    b = 100; c = 1000;
    x = g(10);
    {
        int y;
        y = g(x);
        {
            int x;
            x = a+b;
            b = g(a);
        }
        print(0);
    }
    z = g(0);
    print(0);
    return x * a - y * b + z * c;
}

int g(int a)
{
    print(1);
    a = 2*a; b = 2*b; y = 2*y;
    return (x + y - z) * a;
}

int main()
{
    int c = 1;
    a = 10;
    x = 100;
    y = 1000;
    z = f(x, y);
    z = g(a);
    print(2);
    return 0;
}
```

- 1) What is the output of this program if static scoping is used?
- 2) What is the output of this program if dynamic scoping is used?

You should show the output of every printf() on a separate line. You do not have to show your work, but if your answer for some lines are not correct, you will not get partial credit for the lines for which you do not show your work. **If a value is not initialized, you should assume its initial value is 0.**

## **II Pointer semantics.**

Answer the questions in the attached CSE340S18\_HW4.c program file.