CSS 455 Winter 2012 C. Jackels
Activity No. 2 January 9, 2012
Names (must be present):

The purpose of this activity is to determine the scope of variables and of functions within Matlab. For a complete discussion, see the section of the help pages on *functions.*

1. **Variable scope exercise (main function)**
   a. Boot Matlab on your machine
   b. Download the m-file *demo1.m* from the set1 examples on the course web site.
   c. Place *demo1.m* in your working directory and examine it.
   d. Enter the following commands at the command line:

```
>> clc
>> clear
>> x = 5;
>> y = 10;
>> z = 15;
>> disp ([‘x, y, z in main’])
>> [x y z]
>> demo1 (z)
>> [x y z]
```

   e. Considering your output, answer the following questions:
      i. Are arguments in Matlab passed by reference or by value? How can you tell?

      ii. Are variables in the main program (command line) available to the function? Do they appear to be local or global?

2. **Function and variable scope exercise A**
   a. Download the m-file *demo2.m* from the set1 examples on the course web site.
   b. Place *demo2.m* in your working directory and examine it. *Demo2.m* contains a subfunction *demo3.m.*
   c. Enter the following commands at the command line:

```
>> clc
>> clear
>> x = 5;
>> y = 10;
>> z = 15;
>> disp ([‘x, y, z in main’])
>> [x y z]
```

See reverse side

```
>> demo2 (z)
>> [x y z]
>> demo3(z)
```

d. Considering your output, answer the following questions:
    i. Are arguments in Matlab passed by reference or by value between functions and their subfunctions? How can you tell?

    ii. To which calling programs are subfunctions visible?

    iii. Are local variables in the primary function visible to the subfunction?

3. Function and variable scope exercise B

a. Download the m-file *demo4.m* from the set1 examples on the course web site.
b. Place *demo4.m* in your working directory and examine it. *Demo4.m* contains a nested function *demo3.m.* Otherwise it is the same as *demo2.m.*
c. Enter the following commands at the command line:

```
>> clc
>> clear
>> x = 5;
>> y = 10;
>> z = 15;
>> disp ([‘x, y, z in main’])
>> [x y z]
>> demo4 (z)
>> [x y z]
>>
```

d. Considering your output, answer the following questions:
    i. Are arguments in Matlab passed by reference or by value between functions and their nested functions? How can you tell?

    ii. Are the local variables in the primary function visible to the nested function?

See reverse side