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# NACA.161 Programming Fundamentals II
# In-class Exercise Day 05 – Scope

## Overview

The purpose of these exercises is to help you understand where variables can be accessed.

## Scope Class

1) Write a class called **Scope** that contains no attributes and two methods, one called **method1** and the other one called **method2**.

2) The method **method1** has no parameters and returns an integer. Inside **method1**, declare a local integer variable called **num1** and initialize it to 100. The only action of this method is to return the value of **num1**.

3) The method **method2** has no parameters and returns an integer. Inside **method2**, declare a local integer variable called **num2** and initialize it to 2000. The only action of this method is to return the value of **num1 [not num2]**.

4) Compile the class before going any further. What error message do you receive?

Scope.java:20: error : cannot find symbol

Why is the error message generated since the variable **num1** is defined in the **Scope** class? Hint: your answer should be based on the topic of the exercise.

Because num1 is not in scope

5) Inside **method2**, rename the variable **num2** to **num1**. Make sure your class compiles before continuing. Now both methods declare a local variable named **num1**.

## TestScope Class

6) Write another class called **TestScope** with a main method.

7) Create an appropriate object so that you can call **method1** and **method2** in the **Scope** class and display the value returned from each method.

Since each method use the same variable name in the return statement, why are the two values different? Hint: your answer should be based on the topic of the exercise.

Method 1 = 100 while method2 = 1000 | vars are in their respective return variable inside Scope.

## Back to the Scope Class

8) Declare a private integer attribute [instance variable] named **num1**.

9) Create a default constructor that initializes **num1** to 22.

Which of the three variables named **num1** will be set to 22 by the constructor?

First variable in public class Scope.

10) Compile the **Scope** class and rerun **TestScope**.

Since you just changed your code to set the attribute value to 22, why isn't the attribute's value of 22 displayed? Hint: your answer should be based on the topic of the exercise.

Because we're looking INSIDE the method.

11) Remove the declaration for **num1** from the method **method2**, but still return **num1**.

12) Compile the **Scope** class.

Why does the Scope class successfully compile when you removed the declaration for **num1** in **method2**?

Because no var has been declared inside method 2.

13) Rerun the class **TestScope**.

Which method now displays the attribute value of 22? Method 2

14) In your **Scope** class create another method called **addSum**. Enter the following code for the body of the method:

```
for (int k = 0; k < 10; k++)
{
   int sum = 0;
   sum = sum + k;
}
return sum;
```

Why doesn't the class compile?

Because "return" is out of scope

15) Change the location where you declare the variable **sum** in order to make the class compile.

Where did you put the declaration for the variable **sum**?

Out of scope before For loop

Make sure that the **Scope** class compiles before continuing.

16) In your **Scope** class, create a private integer attribute called **num3**.

Where in the **Scope** class should you declare this attribute?

Before any methods at beginning of class

17) Where in the **Scope** class should you initialize the new attribute **num3** to 7?

Where is at in Q16

18) Write an accessor and mutator for the **num3** attribute. The mutator has no return value and does not validate the new value.

19) Compile the **Scope** class and fix any errors.

20) In the **TestScope** class, declare a local variable named **num3** and initialize it to 55.

21) Write the statement below to add together the value of the variable named **num3** from the **TestScope** class to the value of the attribute named **num3** in the **Scope** class.

```
scope.setNum3(num3+scope.getNum3());
```

**When you complete all of the steps successfully and answer all of the questions, contact your instructor to check if your program(s) executes correctly and to review your code. We will initial the line below.**

**_____Successful execution of code**

**If you do not finish the program during the class period, contact your instructor to initial below so that you can complete it before the next class period.**

**_____Code not completed during lab time**

**You may then have your instructor verify your work at the start of work period in the next class. If you do not have a signature, then you can not receive any points for this assignment.**