

Scripting Languages G22.3033-002 Summer 2008 hw01

Assigned Th 5/22/2008, due Fr 5/30 at 4pm. 50 points.

<http://www.cs.nyu.edu/courses/summer08/G22.3033-002/>

Homework instructions

Homeworks are due on Fridays at 9pm. This deadline will be strictly enforced.

Email your answers to Robert Soulé robert.soule@gmail.com. Please put your solutions to VBA programming problems in a powerpoint presentation. For all other questions (including programming problems in other languages), just send a simple text file, such as what you get when using Emacs, Vi, Notepad, or the "save as text only" feature in Word.

Please make sure that your code works with the compilers and tools installed at CIWW. Specifically, please test:

JAVASCRIPT

Your JavaScript code must run with **both** Mozilla's Firefox browser **and** with Microsoft's Internet Explorer browser.

PHP Your PHP code must run with PHP 5.1.6 on the CIMS web servers, see <http://www.cims.nyu.edu/systems/userservices/webhosting/>.

PERL Your Perl code must run with Perl 5.8.8 for Linux/x86, for example on `doowop1` (see <http://www.cims.nyu.edu/systems/resources/computeservers/>).

VBA Your VBA code must run with Microsoft Office 2003 for Windows on the machines in the labs CIWW 502 or CIWW 624.

Reading assignments

Read for lecture on 5/29: Ousterhout'98

John K. Ousterhout. Scripting: Higher-Level Programming for the 21st Century. IEEE Computer 31(3), 1998. Available online at <http://www.tcl.tk/doc/scripting.html>.

Concept questions

hw01-1 Dynamic typing

(5+6+6 = 17 points)

- Add explicit type annotations to the following VBA program.

```
Sub PrintArray(Arr()  
    Debug.Print "PrintArray:"  
    For I = 0 To UBound(Arr)  
        Debug.Print " " & I & " " & Arr(I)  
    Next I  
End Sub  
Sub Main()  
    Dim fruits(2)
```

```

    fruits(0) = "apple"
    PrintArray fruits
    fruits(1) = "orange"
    fruits(2) = "banana"
    PrintArray fruits
End Sub

```

- b. List three advantages of static typing.
- c. List three advantages of dynamic typing.

hw01-2 Precedence and associativity

(5 + 8 = 13 points)

- a. Remove as many parentheses as possible from the following VBA expression without changing its meaning: $(2 - ((2 - 2) - (2 * 2)))$
- b. The VBA operator table in the 5/22/2008 lecture slides puts all binary logical operators (**And**, **Or**, **Xor**, **Eqv**, **Imp**) on the same line, but in fact, they do not all have the same precedence. Does implication (“**Imp**”) have a higher precedence, lower precedence, or the same precedence as conjunction (“**And**”) in VBA? Describe experiments for answering this question.

Programming exercises

hw01-3 Euclidian distance (VBA)

(10 points) Write a function that computes the Euclidian distance between two arrays. The Euclidian distance between two vectors A and B is defined as

$$\sqrt{(A_0 - B_0)^2 + \dots + (A_n - B_n)^2}$$

For example, consider the following test driver:

```

Sub Main()
    Dim x1(2) As Double, x2(2) As Double
    x1(0) = 0: x1(1) = 0: x1(2) = 0
    x2(0) = 0: x2(1) = 0: x2(2) = 0
    Debug.Print EuclidDistance(x1, x2)
    x2(0) = 1
    Debug.Print EuclidDistance(x1, x2)
    x1(2) = 1
    Debug.Print EuclidDistance(x1, x2)
End Sub

```

The program should print 0, 1, and 1.41421.

hw01-4 Average rows (VBA)

(10 points)

Write a function `AverageRows` that computes the average of each row in a two-dimensional array, and writes the results to a one-dimensional array. For example, consider the following test driver:

```
Sub Main()  
    Dim x(1, 2) As Double  
    x(0, 0) = 1: x(0, 1) = 2: x(0, 2) = 0  
    x(1, 0) = 0: x(1, 1) = 0: x(1, 2) = 2  
    Dim y(1) As Double  
    Call AverageRows(y, x)  
    Debug.Print y(0) & ", " & y(1)  
End Sub
```

The program should print 1, 0.66667.