

Activity 3

Active Learning Exercises

CSS 341

Names (if present in class):

Download the example *HundredthDigit.vbs* onto your desktop and into your editor.

For each digit, this program uses a combination of ordinary floating point division (/), followed by rounding of a biased number to simulate integer division and extract the leading digit from the number. *Be sure you understand how this works!*

1. Devise a test suite for either *HundredthDigit.vbs* or *FiveDigit.vbs*. Recall that the program assumes valid 3 or 5 digit positive integers as input. Test only within that constrained input space. *There is an error in this algorithm.* If your suite does not uncover it quickly, talk to the instructor about how you are devising it. Describe the error and why it occurs.

2. Apply the Hand Tracing (Desk checking) technique to highlight the problem. The following table traces the variables starting with the working section of the code:

	Args.Item(0)	inputNumber	hundredthDigit	restDigits
<i>Prior steps</i>	300	?	?	?
inputNumber=args.Item(0)				
inputNumber=Cint(inputNumber)				
hundredthDigit = inputNumber / 100				
hundredthDigit = CInt(hundredthDigit-0.5)				
restDigits = inputNumber - (hundredthDigit * 100)				

3. **As an alternative**, use the VBScript reference to learn about the integer division operator (\backslash). Describe its action:

4. What do you predict as the value of the following?

a. $N1 = 372$
 $N2 = 100$
 $Result = N1 \ N2$

b. $N1 = 350$
 $N2 = 100$
 $Result = N1 \ N2$

c. $N1 = 315$
 $N2 = 100$
 $Result = N1 \ N2$

5. Use the VBScript reference to learn about the Mod operator
Describe its action:

6. What do you predict as the value of the following?

a. $N1 = 47$
 $N2 = 5$
 $Result = N1 \text{ Mod } N2$

b. $N1 = 93$
 $N2 = 30$
 $Result = N1 \text{ Mod } N2$

c. $N1 = 324$
 $N2 = 100$
 $Result = N1 \text{ Mod } N2$

d. $N1 = 5726$
 $N2 = 1000$
 $Result = N1 \text{ Mod } N2$

7. How would you replace the code in *HundredthDigit.vbs* using integer division and the mod operator? The existing code is:

```
hundredthDigit = inputNumber / 100  
hundredthDigit = CInt(hundredthDigit-0.5)  
restDigits = inputNumber - (hundredthDigit * 100)
```

Using the same variable names, write the replacement code: