

CSCE 3600: Systems Programming

Recitation Assignment 5 – Writing More Bash Scripts

Due: 11:59 PM on Friday, October 8, 2021

RECITATION DESCRIPTION:

The purpose of this laboratory assignment is to get you further practice in writing bash scripts. You may use other resources for this exercise including the lecture notes on Canvas, section 9.2 Shell Scripting in the textbook, or searching for “bash tutorial” on Google, for example. Please feel free to also ask for assistance from your TA or fellow classmates, but make sure that you turn in your own work. Please note that you are writing a bash script, not a C program, for this exercise.

Write a bash script called `rec05.sh` that curves the quiz grades using `for` loops, arrays, and functions as follows:

1. Write a function called `curve` that will apply a given curve to an array of grades. This function will take as input the curve amount, followed by the array of grades.
 - a. Assign the first positional parameter sent to the function to a user-defined variable called `incr`.
 - b. Use the `shift` command with no arguments that will shift all arguments to the left (that means the first positional parameter will disappear, but that's OK because we already assigned it to `incr`). The rest of the parameters represent elements in the array passed to the function.
 - c. Now, assign the rest of the elements of the array to `arr` using `("${@}")`. See `recitation5-example.sh` from my public directory for help on this and other parts of this recitation.
 - d. Create a new user variable called `index` and assign the value 0.
 - e. Write a traditional `for` loop that uses the control variable `i` to iterate over the elements of the array, as in `"${arr[@]}"`. Inside the `for` loop, you will have two lines:
 - i. Use `let` to assign the sum of the control variable `i` and the value of `incr` to the array `grades` with subscript `index`.
 - ii. Then, increment the value of `index` by 1.
2. Your program should accept 1 command-line argument: the amount that grades will be curved in this script. If the number of positional parameters is not equal to 1 (meaning that nothing was passed in as a command-line argument), then you will print out a usage statement indicating that the curve amount should be passed in as a command-line argument.
3. Otherwise, you will do the following:
 - a. Write a traditional bash `for` loop that iterates over the arguments 1, 2, 3, 4, and 5. Inside the `for` loop, you will prompt for the user to enter their grade for a numbered quiz (see SAMPLE OUTPUT) and store that value into an array called

- `grades` using the `read` command. When indexing into the array, be sure to use `$i-1`, assuming `i` is the control variable of the `for` loop.
- Call the `curve` function, passing in the first positional parameter (i.e., the amount of the curve) and the array `grades` itself. The array can be passed using `"${grades[@]}"`.
 - Use `echo` to print out the message `"Curved Grades:"`.
 - Now, use a C-like `for` loop to iterate through all elements of the `grades` array and print out the text for the array element (see SAMPLE OUTPUT) along with the value of the now curved grade. Take a look at the bash lecture notes or the example `recitation5-example.sh` for details on how to do this.

SAMPLE OUTPUT (input in **bold**):

```
$ ./rec05.sh
usage: ./rec05.sh <curve amount>
$ ./rec05.sh 5
Enter QUIZ #1: 92
Enter QUIZ #2: 84
Enter QUIZ #3: 75
Enter QUIZ #4: 88
Enter QUIZ #5: 96
Curved Grades:
grades[0] = 97
grades[1] = 89
grades[2] = 80
grades[3] = 93
grades[4] = 101
```

REQUIREMENTS:

- No comments are required for this recitation assignment.
- Your bash script will be graded based largely on whether it works correctly on the CSE machines (e.g., `cse01`, `cse02`, ..., `cse06`), so you should make sure to execute this script and that it runs on a CSE machine.
- Although this assignment is to be submitted individually (i.e., each student will submit his/her own source code), you may receive assistance from your TA and even other classmates. Please remember that you are ultimately responsible for learning and comprehending this material as the recitation assignments are given in preparation for the minor assignments, which must be completed individually.

SUBMISSION:

- You will electronically submit your bash script to the **Recitation 5** dropbox in Canvas by the due date and time. No late recitation assignments will be accepted.