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**Total duration**: 47:35

Question 1

Question One: FOLLOWING DIRECTIONS Reading instructions is REALLY important to a software developer. Whether it's documentation of an API, a User Persona, or a reference manual on git, you need to prove that you can read and follow directions. REQUIRED INPUT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Here are the five rules: 1. Read instructions for each question completely. 2. Type code directly in the browser. DO NOT use any external editors. 3. Write a comment at the top of each answer with the name of the programming language used. 4. Make an earnest effort. 5. Check over work for typos and other errors. Neatness counts! REQUIRED OUTPUT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Write an HTML page, with <head>, <body>, and all other required tags for a complete web page. Make the background green and the text white. In the BODY, write the text "I confirm that I will do the following:" followed by an ORDERED LIST with each of the five rules above (in the Required Input section). DO NOT \*\*\*\*\*\*\*\*\*\*\* DO NOT consult any outside sources. DO NOT write your code in an external IDE or editor. EXTRA CREDIT \*\*\*\*\*\*\*\*\*\*\*\*\*\* Add a nav bar at the top of the page, with HOME, BACK, and NEXT, all with links to the A100 home page (http://www.apprentice100.com). This nav bar should render horizontally, NOT vertically.

# Html page written in R  
  
q1page = create.html(http://www.question1.com)  
q1page$head = "Question 1"  
q1page$backgroundcolor = "green"  
q1page$textcolor = "white"  
q1page$body =   
"I confirm that I will do the following:  
1. Read instructions for each question completely.  
2. Type code directly in the browser. DO NOT use any external editors.  
3. Write a comment at the top of each answer with the name of the programming language used.  
4. Make an earnest effort.  
5. Check over work for typos and other errors. Neatness counts!  
"  
  
#Bonus  
q1page$nav = "horizontal"  
q1page$nav.home = http://www.apprentice100.com  
q1page$nav.back = http://www.apprentice100.com  
q1page$nav.next = http://www.apprentice100.com

**0:00 / 14:48**

**play1x2x5x**

Question 2

Question Two: MIRROR RORRIM I meant to write, "You're accepted into the A100 Program!" but what came out was: "!margorP 001A eht otni detpecca er'uoY". Clearly, something's wrong with my interpreter. Write a FUNCTION that take in a variable, inputString, that can contain any string (the string will be passed in by another function that you do not have access to). This function should RETURN a variable, reversedString, containing a reversed version of inputString. REQUIRED INPUT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* A single string, inputString, that comes from another function that you do not have access to. REQUIRED OUTPUT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Return a single string, reversedString, that reverses the inputString. DO NOT \*\*\*\*\*\*\*\*\*\*\* DO NOT include user input prompts (such as, "Please enter your input") or take in any user-typed input. Your string will be passed in by a function we write. DO NOT consult any outside sources. DO NOT write your code in an external IDE or editor. DO NOT print anything to the screen. EXTRA CREDIT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Write a second function that accomplishes the same string reversal using a different method. Alternatively, write the same function using a different programming language.

#R script for Reversing function MIRROR  
  
function mirror($inputString: $reversedString)  
    slength = length($inputString)  
    $reversedString[slength]  
    for(i in 1:slength)  
        $reversedString[slength-i] = i   
          
#Extra Credit  
function mirror2($inputString: $reversedString)  
    $reversedString[i] = $inputString[slength-i]

**0:00 / 17:38**

**play1x2x5x**

Question 3

Question Three: TIMES TABLE TIME Your 8-year-old cousin needs to learn his/her times tables. Multiplication tables are a useful way to explain arithmetic. Write a FUNCTION that takes no input, and prints out a multiplication table. REQUIRED INPUT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* None. REQUIRED OUTPUT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Print out a times table to the screen that runs from 1 to 4. It should look like this, with the correct number of rows and columns: 1\*1=1 1\*2=2 1\*3=3 1\*4=4 2\*1=2 2\*2=4 2\*3=6 2\*4=8 3\*1=3 3\*2=6 3\*3=9 3\*4=12 4\*1=4 4\*2=8 4\*3=12 4\*4=16 We must be able to run your code. DO NOT \*\*\*\*\*\*\*\*\*\*\* DO NOT include user input questions (such as, "Please enter your input"). DO NOT consult any outside sources. DO NOT write your code in an external IDE or editor. EXTRA CREDIT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Make your table print well for values up to 20. Include a comment to explain how your solution "prettifies" the output for larger values.

# R code for times table  
  
$timestable = table[20, 20]  
for (i in 1:20)  
    $timestable[i,j] = print "i"\*"j" = i\*j  
      
#Extra Credit: the solution allows values up to 20

**0:00 / 6:23**

**play1x2x5x**

Question 4

Question Four: CRIBBIN' ON FIBONACCI The Fibonacci series is a well-known mathematical series. It comprises the numbers in the following sequence: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144 . . . (and so on) It begins with 1 (the FIRST digit) and 1 (the SECOND digit). Each number is the sum of the previous two numbers. Write a FUNCTION that, given an integer n as input (by another function, not by a user), gives as its output the SQUARE of the nth Fibonacci digit. This should be a single number in each case. REQUIRED INPUT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* A single integer, n. REQUIRED OUTPUT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* A single integer, that is the result of the above function. Examples: If passed in the value n=4, your function should return 9, as 3 is the 4th Fibonacci digit, and 3\*3=9 (see times table above). If passed in the value n=10, your function should return 3025, as 55 is the 10th Fibonacci digit, and 55\*55=3025. We must be able to run your code. DO NOT \*\*\*\*\*\*\*\*\*\*\* DO NOT include user input questions (such as, "Please enter your input") or take in any user-typed input. Your function must accept any integer we pass to it. DO NOT consult any outside sources. DO NOT write your code in an external IDE or editor. EXTRA CREDIT \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* Don't use recursion.

# R code for Fibonacci sequence  
  
$Fibonacci[1] = 1  
$Fibonacci[2] = 1  
for (i in 3:1000)  
    $Fibonacci[i] = $Fibonacci[i-2] + $Fibonacci[i-1]  
      
function fibsquare (function(input): fibs)  
    fibs = $Fibonacci[input]\* $Fibonacci[input]

**0:00 / 8:38**

**play1x2x5x**

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