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Part 1

	Available	Marks
Create a vector <i>v1</i> that contains the values 1 to 16	2	2
Add the values 17 to 20 to the end of <i>v1</i> .	2	2
Delete elements 5, 6, 7 and 13 from <i>v1</i> . You should use a one method to remove elements 5, 6, 7 and another method to remove element 13.	4	3
Using <i>v1</i> , create a new vector <i>v2</i> that contains the 1 st to 5 th and 9 th to 11 th elements of <i>v1</i> .	3	3
Calculate <i>v1</i> * <i>v2</i> and display the results. In your comments, explain how R adds two vectors of different lengths.	4	4
Create a new vector <i>v3</i> by selecting all even elements of <i>v1</i> using a filter	2	2
Using a loop, create a new vector <i>v4</i> the same length as <i>v1</i> , that contains the value <i>TRUE</i> if the corresponding element of <i>v1</i> has an integer square root and the value <i>FALSE</i> otherwise. <i>HINT: You will need to use the sqrt() and round() functions.</i>	6	2
Create a matrix <i>m1</i> with 4 rows from vector <i>v1</i>	3	3
Create a matrix <i>m2</i> with 2 columns from vector <i>v2</i>	3	3
Swap all of the elements in row 3 of <i>m1</i> with the elements in column 2 of <i>m1</i>	3	2
Create and display a new matrix <i>m3</i> from <i>m1</i> and <i>m2</i> where <i>m3</i> contains all of the columns of both source matrices	2	0
Replace all values in <i>m3</i> that are in (column 1 or column 3) and in (row 2 or row 3) with double their value	4	4
Remove row 2 of <i>m3</i>	1	1
Label the columns of <i>m3</i> as "c1", "c2", "c3", "c4", "c5", and "c6"	1	1
Create a vector <i>mmeans</i> that contains the means of each column	3	2
Create a barplot of <i>mmeans</i>	2	2
Commenting, white space etc.	5	3

Comments

You've ended up with a v1 of length 17, not 16, because you've forgotten that you'd already removed element 13 in the 8:20 section, so it recycled. You would probably have noticed this if you had displayed the vector after creating it.

Use of subset is perfectly fine.

Error in if (sqrt(i)%%2 == 0) v4[i] <- TRUE else v4[i] <- FALSE :

missing value where TRUE/FALSE needed

The basic loop is fine, but you're not checking to see if the square root is an integer, you're checking to see if it is even.

You replaced row 3 with column 3, but did not replace column 3 with row 3 (swap, not replace).

M3 should be 6 column by 4 rows, not 5 by 5. The matrix you've created has recycled to build itself. You could have just used cbind(m1,m2) to build m3.

Creating the means like that works, but using apply() is better.

Commenting and use of white space is good, but you should always put your name at the top of the code.

Part 2

	Available	Marks
Create <i>Polybius</i> matrix	5	4
Encrypt the message using the <i>Polybius</i> matrix	20	14
Display the ciphertext in groups of five characters	20	8
Commenting and use of white space	5	3
Comments Q1: Good matrix generation, although it would be better to use NA rather than “ “. Q2: Good encryption, although it would be better to start with the 1-element vector “CAPTURETHEHILL” rather than a longer vector of individual characters. Q3: You need to remove the commas and spaces between the numbers and add two more to the final set of three, but the basic idea is there. Use of white space is good. Commenting is good, but needs your name/number at the top and comments identifying where each question begins.		