

Student	Youqian Chen	79
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Part 1

	Available	Marks
Create a matrix <i>message1</i> that contains the character data above, together with the numerical labels for rows and columns. Display this matrix.	5	3
Generate the ciphertext using the following ruleset: Start at 5,5 and work towards the left. Read odd-numbered columns upwards and even-numbered columns downwards. Display the encrypted message as a vector <i>ciphertext1</i> which contains each character of the ciphertext as a separate element in the vector.	20	18
Suppose that the message is written in a 3x9 array rather than a 5x5 array. Generate an appropriate matrix <i>message2</i> and use the two methods given in the introduction to generate two more vectors <i>ciphertext2</i> and <i>ciphertext3</i> .	15	11
Which of the two matrices, <i>message1</i> or <i>message2</i> do you think produces the most secure encryption methods? In a comment at the end of your script say which you think is the most secure and why this is the case. Do not write more than 100 words on this.	5	5
Commenting and use of white space	5	3
	TOTAL	40
Comments Some commenting and good use of white space, but remember to include your name and student number in a comment at the top of the script. 1.1 Matrix loads well but you also need to add row and column labels. 1.2 Good solution. It would help to have comments within the loop, not just at the start of the problem. 1.3 Yes, R defaults to always organising things by columns. Both solutions work, but lines 94-96 should be handled within the loops rather than hard coded at the end. 1.4 Good. Size, symmetry, and geometry all play a part in improving the security of the method.		

Part 2

	Available	Marks
Create an appropriate matrix to hold the decrypted message and populate it from the ciphertext. Display the matrix once it has been populated. METHOD 1	13	13
Create an appropriate matrix to hold the decrypted message and populate it from the ciphertext. Display the matrix once it has been populated. METHOD 2	13	11
Create an appropriate matrix to hold the decrypted message and populate it from the ciphertext. Display the matrix once it has been populated. METHOD 3	13	9
Which of the two matrices, 5x5 or 9x6, do you think produces the most secure encryption methods? In a comment at the end of your script say which you think is the most secure and why this is the case. Do not write more than 100 words on this.	6	3
Commenting and use of white space	5	3
	TOTAL	39
Comments Some commenting and good use of white space, but remember to include your name and student number in a comment at the top of the script. 2.1 Elegant. 😊 2.2 Good solution. Again, it would help to have comments within the loop, not just at the start of the problem. 2.3 Lines 49-52 need comments to explain what the variables represent. Not including comments within the structure like this makes it difficult to follow. 2.4 An asymmetrical matrix makes it harder to decrypt than a square matrix.		