Module 1 – Take-home Exam

Please complete the questions below to demonstrate your knowledge of scripting in R. You are welcome to use any resources you wish, including class notes and the internet. Having said that, it would be useful for me to know what resources you used to answer each question. For each question, please indicate what resource you used by circling one of "self", "notes", or "internet". This exam is due at the beginning of class on Monday, February 20th.

1) For each pair below, indicate one similarity and one difference:
  a. vector & matrix

  b. data frame & list

  c. if-else statement & for-loop

SELF   NOTES   INTERNET

2) Write the code necessary to create the matrix below.
1 2 3 4
5 6 7 8
9 10 11 12

What code would access only the third column of the matrix?

What code would return the number 7?

SELF   NOTES   INTERNET

3) Given the vector of strings: words=c("cat","hat","fish","dish","fox","socks")
What code would capitalize all the vowels?

What code would return only "cat" and "hat"?

SELF   NOTES   INTERNET

4) You have a 100 x 25 matrix (call it D) that you want to find the range (maximum-minimum) for the numbers contained in each row. Write the code to accomplish this task using a loop.

SELF   NOTES   INTERNET

Now write a custom function and use an apply-family function to apply your function to each row of matrix D.

SELF   NOTES   INTERNET

Now modify your loop-based code to only return a range for rows that have a maximum greater than 25 and return an NA in cases when the maximum is less than 25.

SELF   NOTES   INTERNET

5) The code below uses nested for-loops to fill a matrix containing the multiplication table for 1 to 10. The code should create this matrix:

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

However, the code doesn't work. Please correct the errors in the code.

```
M=matrix(NA,8,10)
for(i in 1:10){
     for(i in 1:10{
          M[1,j]=i*10
     }
}
```

SELF   NOTES   INTERNET