Problem set - 1
(basic commands of R programming)

The following problems are expected to be solved solely by students within two weeks.

1. Which of the following are acceptable scalar variable name in R:
   (a) data.mean   (b) data_average   (c) BigData   (d) 1point   (e) data[minor]

2. Give example of numeric, logical and character variable.

3. Do the following calculations and assign to a variable: (a) Add any two real numbers. (b) Multiply two real numbers.   (c) Subtract a number from another.   (d) Find 0.9^4.

4. Which of the following squares negative 7 and adds 3 to the result?
   (a) $-7\hat{}2 + 3$ (b) $(-7)\hat{}2 + 3$ (c) $(-7)\hat{}(2 + 3)$ (d) $-7\hat{}(2 + 3)$

5. Assign 0.7 to a variable p and 0.9 to variable q. Then find the following:
   (a) abs(p+q)   (b) sqrt(p)   (c) round(q)   (d) round(digits = 2, x = 1.41421)
   (e) log(p,base=10)   (f) sin(p)   (g) atan(p)

6. Create two vectors a and b containing odd and even numbers (from 1 to 10) respectively. Then use appropriate command to
   (a) add (and multiply) a and b element-wise.   (b) find dot product of a and b.   (c) add third element of a with last element of b.
   Install and load the package *'geometry'* and then again find dot product of a and b.

7. Generate a column vector a of length 20 with random values. Then
   (a) sort the vector in increasing order,
   (b) remove the 3rd element from it,
   (c) confirm that after removing this element the length of the vector is now 19,
   (d) store the 1st, 3rd and 5th element in a separate vector and display it.

8. Create a sequence of length 100 from 3 to 100 with uniform steps.

9. The conversion from a temperature measurement in degrees Fahrenheit F to Celsius C is performed using the equation: $C = \dfrac{5}{9}(F - 32)$. Use vector-oriented behavior in R to convert the temperatures 45, 77, 20, 98, 101, 120, and 212 in degrees Fahrenheit to degrees Celsius.

10. Repeat the vector c(-1,3,-5,7,-9) twice, with each element repeated 10 times, and store the result. Display the result sorted from largest to smallest.

11. Store your first name in a string variable 'my.fname' and last name in 'my.lname'. Then
    (a) use help.search "concatenate" to find appropriate command to concatenate your first and last name.
    (b) display your full name.
    (c) find the number of character in your full name.
    (d) check whether your name consist of 14 character.

12. Use appropriate command to quit R.