MA2107: Problem Set 1

- 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] (f) data.1b (g) _abc (h) .abc
- 2. Give examples 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 0.94⁴.
- 4. Which of the following squares negative 7 and adds 3 to the result? (a) -7^2+3 (b) (-7)^2+ 3 (c) (-7)^(2 + 3) (d) -7^(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.
 - (d) install and load the package 'geometry' and then again find dot product of a and b.
- 7. Store the following sequence to a vector v:

$$1^{2} + \frac{1}{1}, \ 2^{2} + \frac{1}{2}, \ 3^{2} + \frac{1}{3}, \ \dots, \ 100^{2} + \frac{1}{100}.$$

- 8. 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.
- 9. Create a sequence of length 100 from 3 to 100 with uniform steps. Create another sequence starting from -0.1 and ending at 0.1 with an equal step size of 0.001.
- 10. The conversion from a temperature measurement in degrees Fahrenheit F to Celsius C is performed using the equation: $C = \frac{5}{9}(F 32)$. Use vector-oriented behavior in R to convert the temperatures 45, 77, 20, 98, 101, 120, and 212 in degrees Fahrenheit to degrees Celsius.
- 11. 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.
- 12. 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.
- 13. Use appropriate command to quit R.