Homework 5 Factors. Stacking, Unstacking Data.

1. (10 points) A personnel director for a large firm categorizes colleges and universities as most desirable, good, adequate, and undesirable for purpose of hiring their graduates.
   a. Use an appropriate function covered in the section "Dataframes" to read the file **ratings.txt**. The resulting object should be a character vector with 68 components.
   b. Create **a factor** from the character vector in part a. The levels of the factor should be ordered as follows: Undesirable < Adequate < Good < Most desirable.
      Display the resulting vector.
   c. Use an appropriate option of function **factor()** to express ratings as integers from 0 through 4, where 0="Undesirable", 1="Adequate", 2="Good", and 3="Most desirable". Display the resulting vector.

2. (30 points) An experiment was conducted to determine the effects of four different pesticides (P1, P2, P3, P4) on the yield of fruit tree from three different varieties (V1, V2, V3) of a citrus tree. Yields of fruit (in bushels per tree) appear in the following table.

Variety	Pesticide			
	P1	P2	P3	P4
V1	20	17	24	20
	21	18	23	19
	20	16	24	18
V2	20	18	23	18
	19	18	20	19
	22	20	34	17
V3	24	20	27	22
	23	21	28	22
	24	20	27	23

   a. (5 points) Use **read.table( )** or **scan**( ) to read the data from the file **fruit_unstacked.txt** and create a data frame called **fruitUnstacked**.
   b. (10 points) Convert **fruitUnstacked** to a stacked data frame named **fruitStacked**. Use functions **stack( )** and/or **scan( )** to accomplish the goal. The new data frame should contain three columns named as follows: Yield, Pesticide, Variety.
      Note: Yield is a numerical variable. The order of the columns in the data frame does not matter.
      Display your data frame.
   c. (5 points) Use function **write.table()** to save **fruitStacked** as **fruit_stacked.txt**. Utilize the options of function **write.table** to obtain a dataset whose elements are surrounded by quotes, the rows of the dataframe should not be numbered (1, 2, …; review homework 4), and use comma as a delimiter.
   d. (5 points) Use function **aggregate()** to find the average yield for each combination of Variety and Pesticide (for ex. Variety V1 and Pesticide P2). The resulting data frame should have the columns named as follows: Variety, Pesticide, Average.
      Display the result.

e. (5 points) Unstack **fruitStacked** by variable Variety and name the dataframe **yieldByVariety**. Then unstack **fruitStacked** by variable Pesticide and name the dataframe **yieldByPesticide**. Display the results