CSC 2262, Fall 2021, Lab 6

Write a MATLAB program that reads a data file (Lab6.dat), where each line contains an employee's ID, hours worked, and rate of pay. For each employee, the program will do the following:

1) Calculate the wages as hours times rate.

2) Calculate the bonus as 15% of the wages.

3) Calculate the gross pay as wages plus bonus.

4) Calculate the withholding tax as 12% of the gross pay.

5) Calculate the net pay as gross pay minus withholding tax.

6) Print the array of IDs, the array of wages, the array of bonuses, and the array of net pay.

The program will also calculate and print the average, standard deviation (sd), root mean square (RMS), and harmonic mean (H) of the wages, bonuses, and net pay. Call a function named Stats to calculate the averages, standard deviations, root mean squares, and harmonic means.

The average of the elements of an array is the sum of the elements of the array divided by the number of elements in the array.

The standard deviation, root mean square, and harmonic mean of an array named a are given by:

$$sd = \sqrt{\frac{n\sum a_k^2 - \left(\sum a_k\right)^2}{n(n-1)}}$$

$$RMS = \sqrt{\frac{\sum a_k^2}{n}}$$

$$H = \frac{n}{\sum \frac{1}{a_k}}$$

where

n is the number of elements in the array a

$\sum a_k$ **is the sum of the elements in the array a**

$\sum a_k^2$ **is the sum of the squares of the elements in the array a**

$\sum \frac{1}{a_k}$ **is the sum of 1 over each element in the array a**

HINT: To get the sum of the squares of the elements in the array a, first create a new array that contains the squares of the elements in the array a, and then sum the elements in this new array.

HINT: To get the sum of 1 over each element in the array a, first create a new array that contains 1 over each element in the array a. Create this new array by dividing 1 by the array a. Then sum the elements in this new array.

NOTE: To sum the elements in an array, use the sum function. For example, the sum of the elements in an array named a is given by sum(a).

NOTE: To print an array, put the name of the array on a line by itself with no semicolon after it

NOTE: DO NOT USE ANY LOOPS IN THIS PROGRAM.

The output of this program should look like the output shown below.

Output

```
ID =
        4681
        5932
        7456
        2814
        3267
        9548
        6375
        8193
wages =
   1.0e+03 *
    0.7780
    0.7335
    0.3237
    0.5420
    0.4967
    0.9625
    1.0951
    0.8257
bonus =
  116.7075
  110.0250
   48.5625
   81.3000
   74.4975
  144.3750
  164.2650
  123.8475
netPay =
   1.0e+03 *
    0.7874
    0.7423
    0.3276
    0.5485
    0.5026
    0.9740
    1.1082
    0.8356

Wages:  Average=719.65   Standard Deviation=254.33  RMS=757.96  Harmonic Mean=627.00
Bonus:  Average=107.95   Standard Deviation=38.15  RMS=113.69  Harmonic Mean=94.05
NetPay:  Average=728.29   Standard Deviation=257.39  RMS=767.05  Harmonic Mean=634.52
```