

ME 120
Homework 5

Due 16/17 November 2016

Given the data (x_i, y_i) below with $i = 1, 2, \dots, 6$ for questions 1 to 3:

x (time)	y (velocity)
10	26
25	52
33	72
42	90
52	100
65	129

1. Plot the velocity versus time in excel using the scatter plot. Print your graph in a word document as part of your homework.
2. Compute the terms below.
 - a. $\sum x_i$
 - b. $\sum y_i$
 - c. $\sum x_i y_i$
 - d. $\sum x_i \sum y_i$
 - e. $(\sum x_i)^2$
 - f. $\sum x_i^2$
3. Compute the slope (m) and intercept (b) of the least squares line fit and substitute m and b by their values in the equation $\hat{y} = mx + b$
4. Compute the R^2 value for this set of data and the linear curve fit computed in 3.

5. The two build-in Arduino functions *setup* and *loop* are passed no arguments and return no arguments and so are declared as *void setup()* and *void loop()*. For a general case, what is the syntax of a user-defined function's declaration?
6. Write a function called *SizeCheck* that accepts two integer arguments and returns a Boolean (TRUE/FALSE). The function should return a TRUE value only if the first integer is larger than the second integer (you can check the return of your user-defined function by using the *Serial.print* function in your *void setup()*).
7. What argument is returned if a user uses the same number for both input arguments?

Use a word processor to include the source code and the result from the serial monitor for problems 6. And 7. (you can use the "PrintScreen" to obtain an image of the serial monitor).