

**ENGINEERING H192**  
**DAILY ASSIGNMENT B10**

**Data structures for storing multiple values of the same type: Arrays**

The purpose of this assignment is to gain experience using a new data structure, the array. Arrays allow you to store multiple values of the same type (int, float, double, char, etc.) using a single variable name. Arrays are often used to store multiple values in which the data are in some way related. Because the individual values stored within an array can be accessed using an “index” (or “subscript”), arrays are well suited for repetitive tasks and use in conjunction with loops. For this assignment you will read multiple data points from a file into arrays and use the formula below to calculate the standard deviation of the data.

You will find a file, **b10.dat**, that contains a list of the player weights (in pounds) of the 2006 OSU football team in `~engh192/students`. Copy **b10.dat** to your working directory and inspect the file to determine which column contains the players’ weights.

Write a **complete C/C++** program to:

- (1) Read all of the data from the file
- (2) Print the player numbers and weights to the screen using the data stored in the arrays
- (3) Compute the average weight
- (4) Compute the standard deviation of the weights
- (5) Display the results, properly identified, in the Linux Window

The formula for computing standard deviation is given below, where  $n$  is the number of data points, the  $x_i$  are the individual data points, and  $\bar{x}$  is the average of the data.

$$s = \pm \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{(n-1)}}$$

Once **b10.cpp** is running correctly, modify it to open an output file, **b10result.txt**, and write everything to the file that is being written to the screen. Submit a copy of **b10.cpp** and **b10result.txt** along with this sheet.

Name \_\_\_\_\_ Instructor \_\_\_\_\_ Seat \_\_\_\_\_ Hour \_\_\_\_\_