

Lab Assignment-3

3. Programming project on Repetition and Looping Statements

- 3.1
- Write a program that will find the smallest, largest, and average values in a collection of N numbers. Get the value of N before scanning each value in the collection of N numbers.
 - Modify your program to compute and display both the range of values in the data collection and the standard deviation of the data collection. To compute the standard deviation, accumulate the sum of the squares of the data values (`sum_squares`) in the main loop. After loop exit, use the formula

$$standard\ deviation = \sqrt{\frac{sum_squares}{N} - average^2}$$

- 3.2 Write a program to process weekly employee time cards for all employees of an organization. Each employee will have three data items: an identification number, the hourly wage rate, and the number of hours worked during a given week. Each employee is to be paid time and a half for all hours worked over 40. A tax amount of 3.625% of gross salary will be deducted. The program output should show the employee's number and net pay. Display the total payroll and the average amount paid at the end of the run.
- 3.3 Suppose you own a beer distributorship that sells Piel's (ID number 1), Coors (ID number 2), Bud (ID number 3), and Iron City (ID number 4) by the case. Write a program to
- Get the case inventory for each brand for the start of the week.
 - Process all weekly sales and purchase records for each brand.
 - Display out the final inventory.

Each transaction will consist of two data items. The first item will be the brand ID number (an integer). The second will be the amount purchased (a positive integer value) or the amount sold (a negative integer value). For now you may assume that you always have sufficient foresight to prevent depletion of your inventory for any brand. (Hint: Your data entry should begin with four values representing the case inventory, followed by the transaction values.)

- 3.4 Assume that United States consumers put \$51 billion in fast food charges on their credit and debit cards in 2006, up from \$33.2 billion in 2005. Based on this model of the billions of fast food charges,

$$F(t) = 33.2 + 16.8t$$

where t is years since 2005, write a program that repeatedly prompts the user to enter a year after 2005 and then predicts the billions of dollars of fast food charges U.S. consumers will make in that year. Define and call a function *fast_food_billions* that takes the year as its input argument and returns the prediction as its result. Tell the user that entry of a year before 2005 will cause the program to stop.