ROB-GY 6103 Advanced Mechatronics: HW 4

Problem 1: Program a Propeller Activity Board to prompt a user to enter the following float values.

a. Angular velocity of a wheel (in rad/s)
b. Wheel radius (in m)
c. Travel duration (in s)

The program should read these inputs, compute the linear velocity (in m/s) and distance traveled (in m), and print the results.

Problem 2: Program a Propeller Activity Board to generate an array of 50 random integers in the range from 0 to 99. Create functions in the program to compute and print the average and standard deviation of the array.

Problem 3: Write and implement a program on a Propeller Activity Board that prompts a user to enter their height (in feet and inches) and their weight (in pounds). Next, create a computeBMI() function that must be called from the main() function to compute the body mass index. The call to computeBMI() function must pass the user entered height and weight as parameters and the function must return to the main() the computed BMI value. No global variable must be used in creating your solution for this problem.

$$BMI = \frac{W \times 703}{H^2}$$

W: Weight in lbs; H: Height in inches

Problem 4: Write and implement a program on a Propeller Activity Board that provides conversion of temperature from °F units to °C. Your program should employ a loop to step through °F temperature in the range from 20 to 120 °F in one °F steps. One function must be used to pass the temperature in °F and receive the returned "float" value of °C; yet another function should be called to display properly formatted °F and °C temperatures in two columns.

$$T_C = \frac{(T_F - 32) \times 5}{9}$$

T_c: temperature in °C; **T_F: temperature in** °F