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# Assignment 2: Estimate the melting point of Cerrolodium using calibrated measurements from a new sensor.
# Seth Kurtenbach

fm = fopen("A2-MeasurementData.bin");
fc = fopen("A2-CalibrationData.bin");

measurements = fread(fm, Inf, "float");
calibrations = fread(fc, Inf, "float");

meanc = mean(calibrations);
printf("calibrations mean: %f\n", meanc);

bias =  meanc -(31.006277);
printf( "bias = %f\n", bias);

for i = 1:length(calibrations)
   newcals(i) = calibrations(i) - bias;
end

stddev = std(newcals);
printf("stddev: %f\n", stddev);

estmeasure = mean(measurements) - bias;
printf("estimated melting point: %f Celsius\n", estmeasure);

fclose("A2-MeasurementData.bin");
fclose("A2-CalibrationData.bin");

###### RESULTS ######################
# bias                  = -0.235710
# melting point         = 20.085607 degrees Celcius
# standard deviation    = 0.062831
# Estimate              = (20.085607, 0.062831)
```