

Problem Set 1
Forest Measurements FO-2122

TREE #	DBH	HEIGHT
1	14.0	88
2	12.3	92
3	14.6	93
4	17.1	94
5	16.0	91
6	13.2	85
7	14.7	86
8	12.1	91
9	14.4	75
10	15.5	85
11	16.3	90
12	13.6	77
13	19.4	93
14	14.1	83
15	12.0	89
16	12.6	85
17	16.1	103
18	15.4	84
19	12.2	86
20	14.7	83
21	14.1	89
22	15.2	92
23	13.6	89
24	11.2	81
25	14.3	93

1. For the total heights, calculate the mean, standard deviation, standard error of the mean, coefficient of variation, sampling error, and the 95% confidence interval.

2. Tree volumes:
 - A. Apply the tree equation $Ft^3 (ob) \text{ to } 3'' \text{ Top} = -.09 + .002618(D^2H_0)$ to the dbh-height data to obtain per tree volumes.
 - B. Compute the same statistics as required for problem 1 above for the per-tree volumes.

3. Regression:
 - A. Compute the linear regression and precision statistics ($r^2, I^2, s_{y,x}$) for the model $\text{Height} = b_0 + b_1(\text{DBH})$.
 - B. Compute the linear regression and precision statistics ($r^2, I^2, s_{y,x}$) for the model $\text{Ln}(\text{Height}) = b_0 + b_1(\text{DBH}^{-1})$.

3. Regression:
 - A. Compute the linear regression and precision statistics ($r^2, I^2, s_{y,x}$):
 - (1) for the models $\text{Volume}_{\text{cu.ft}} = b_0 + b_1(\text{DBH})$ where single tree Volume is the Y variable and (DBH) is the X variable.
 - (2) and $\text{Volume}_{\text{cu.ft}} = b_0 + b_1(\text{DBH}^2)$ where single tree Volume is the Y variable and (DBH²) is the X variable.
 - B. Which model gives the best fit? Why?