

STEVENS INSTITUTE OF TECHNOLOGY

SYS-601 Homework #2

Due Feb. 5 2018

Submit the following using the online submission system: 1) Cover sheet with name, date, and collaborators, 2) Written responses in PDF format, 3) All work (e.g. .xlsx or .py files).

2.1 Origami Statistics [15 points]

This problem works with a dataset for origami products manufactured during class available from the CSV file `origami.csv`.

- (a) 10 PTS Using the full dataset on time to manufacture an origami **boat**:
 - (i) 1 PT Compute the mean (\bar{x}).
 - (ii) 1 PT Compute the median.
 - (iii) 2 PTS Compute the 5th and 95th percentile (P_5, P_{95}).
 - (iv) 2 PTS Compute the 1st, 2nd, and 3rd quartile (Q_1, Q_2, Q_3).
 - (v) 1 PT Compute the interquartile range (IQR).
 - (vi) 1 PT Compute the sample variance and sample standard deviation (s^2, s).
 - (vii) 2 PTS Create a histogram with appropriate bins.
- (b) 5 PTS For **each** team manufacturing at least 5 origami boats, create a box-and-whiskers plot where whiskers show extremes within $1.5 \times \text{IQR}$. For example, if three teams produced at least 5 boats each, your answer should have three separate box plots.

2.2 Coin Flip Statistics [5 points]

Flip a coin $N = 30$ times. Record a “dummy” variable x for each toss indicating an outcome of either heads (1) or tails (0).

- (a) 2 PTS Compute the sample mean (\bar{x}) and standard deviation (s^2).
- (b) 2 PTS Create a histogram with appropriate bins.
- (c) 1 PTS What would you expect the population mean (μ) to be?