Math 593 – Worksheet on "Pigs and Probability" and the Normal Approximation to the Binomial Distribution

Name: _____

We conclude the new material in the course with an interesting project which will encompass portions of both out probabilistic and statistical material, and an Excel project demonstrating the empirical reasonableness of a somewhat surprising result.

Pigs and Probability

1. **Materials:** Each two-person team will be given two Little Plastic Pigs (available, with many other probabilistically interesting items, at BJ's Craft Supplies:

$$\text{http://www.bjcraftsupplies.com/miniatures/animal-pig01.asp}$$

2. Your first task is to approximate the probability distribution for the experiment of rolling one pig, one time.

   (a) Are the possible outcomes of tossing a porcine critter categorical or quantitative?

   (b) Assign values to each outcome in the sample space, and collect these values in set notation.

   (c) Now perform 200 experiments to obtain a point estimate for the true (population) proportion for each outcome O in the SS. I suggest that one member of the team roll two pigs simultaneously, sufficiently separated to preserve independence, and the other team member record each outcome. Make a table below recording the tally of the number of outcomes of each value, and at the bottom of the table compute the proportion $\hat{p}_O$ of each outcome so obtained: