This assignment requires the completion of two models:

1. Spreadsheet model.
Supermarket customers load their carts with a raw order amount of goods totaling between $5 and $200, following a continuous uniform distribution. Assume that customers purchase independently of each other.

The following discounts are possible at checkout:

a) 63% of customers have a loyalty card that entitles them to a 4% discount off the raw order amount
b) 18% of customers have coupons that give them 7% off the raw order amount

These discounts occur independently of each other. A given customer could have one of the discounts, both of the discounts, or neither of the discounts.

The raw order amount, less any discounts, determines the net order amount (what the customer actually pays).

Construct a spreadsheet simulation to simulate 100 customers. Collect statistics on the net order amount. These statistics should include the average, standard deviation, minimum, and maximum of the net order amounts.

Extra Credit:
Construct a histogram to show the distribution of the net order amounts between $0 and $200 in $25 increments.

2. Arena Model.

Begin with Model 3-1 (you may copy and start with the file "Model 03-01.doe" that is included with the Academic version of Arena). Modify the model to double the rate of arrivals. Make five replications of the model and compare your results to what we observed in the hand simulation (see Figure 2-4 on page 35). Use Arena to produce one report of the summary results for all replications and another report to display results for each individual replication. All reports must be in .pdf format.

Due date and time:
- All files must be posted to Blackboard by the end of day (that is before midnight) on February 7, 2011.
Files required are:
  > A Microsoft Office compatible Excel spreadsheet for the spreadsheet simulation
  > An Arena .doe file implementing the changes to Model 3-1
  > A .pdf file containing the combined results of the modified Model 3-1
> A .pdf file containing the results, individually, for each of the 5 replications of the modified Model 3-1

- A signed statement citing the following is due at the start of class on February 8, 2011:

  > Your name, the date, the Homework assignment number, the names of the files that you posted to Blackboard.
  > Any outside references used (other than the course textbook by Kelton). These citations should follow the format of a standard research report reference list.
  > The identification and extent of any assistance that you received from other persons.
  > If no references were consulted and no assistance was received then the statement should read "The files submitted for this assignment were entirely the result of my own work and I neither sought, nor received any assistance in their preparation."

Your score on this assignment will be weighted as 10% of the total of the 5 graded homework/mini-project assignments.