**Delta Blue Airlines**

Delta Blue Airlines operates a commuter flight between Charlotte and Philadelphia. The plane holds 30 passengers in Economy and 6 passengers in First Class. The airline makes a $100 profit on each passenger in Economy and $200 per passenger in First Class on the flight. When Delta Blue takes 30 Economy reservations and 6 First Class for the flight, experience has shown that on average, two passengers do not show up for each class. As a result, Delta Blue is averaging 28 Economy passengers and 4 First Class passengers with a profit of 28\*$100 + 4\*$200 = $3600 per flight. The airline operations office has asked for an evaluation of an overbooking strategy where they would accept 32 Economy reservations and up to 8 First Class reservations even though the airplane holds only 30 Economy and 6 First class passengers. The probability distribution for the number of passengers showing up with the new overbooking reservations policy is as follows:

|  |  |
| --- | --- |
| # of Passengers Showing up  For Economy | Probability |
| 28 | 0.05 |
| 29 | 0.25 |
| 30 | 0.50 |
| 31 | 0.15 |
| 32 | 0.05 |

|  |  |
| --- | --- |
| # of Passengers Showing up  For First Class | Probability |
| 1 | 0.02 |
| 2 | 0.06 |
| 3 | 0.17 |
| 4 | 0.20 |
| 5 | 0.25 |
| 6 | 0.23 |
| 7 | 0.05 |
| 8 | 0.02 |

The airline will incur a cost for any passenger denied seating on the flight. This cost covers added expenses of rescheduling the passenger as well as loss of goodwill, estimated to be $150 per Economy passenger and $300 per First Class passenger. On the other hand, if there are First Class seats available, they move up Economy passengers to First Class. When this happens, they believe there is a positive goodwill “cost” of $200. Build a simulation model in an Excel file that will model the performance of the overbooking system. Model 500 flights. And answer the following questions.

1. What is the mean profit per flight if overbooking is implemented?
2. What percentage of customers will experience an overbooking problem?
3. Does your model recommend the overbooking strategy? Any suggestions?