Case Study #5: Salary Plans

You have been hired as a senior operations manager in a large retail chain that sells various supplements and vitamins. The chain's CEO would like you to analyze two alternative salary plans for supervisors in a new company's store. The first plan would pay $25 an hour plus 6% commission on total daily sales above $8,000. The second plan would pay $30 an hour plus 3% commission on any daily sales above $7,000. Each supervisor will be working 8 hours a day.

In the store, daily sales highly depend on two parameters: number of customers buying in the store and how much they purchase. According to the existing records, it is known that the number of buying customers varies randomly from day to day; the following historical data describe the probabilities of the number of customers occurring in a day:

Number of Buying Customers	*Probability*
Below 100	0.08
100+ to 200	0.22
200+ to 300	0.35
300+ to 400	0.29
400+	0.06

In addition, the following historical data describe the probabilities of each amount of purchases occurring in a day:

Amount of Purchase, $	*Probability*
Below 10	0.07
10 to 20	0.17
20+ to 30	0.28
30+ to 40	0.25
40+ to 50	0.14
50+	0.09

Questions.

1. Use a simulation model in Excel (without @Risk) to identify which plan is better in terms of the higher daily wage. Briefly explain your results. Compare the simulation results with the results based on the average number of buying customers and average number of purchases.
2. Use a simulation model in Excel (with @Risk) to identify the better plan. Briefly explain your results, and compare the two plans results in questions 1 and 2 (without and with @Risk).
3. Consider normal distributions of the number of buying customers and amount of purchase. The mean and standard deviation of the normal distribution for each parameter should be equal to the mean (average) and standard deviation of the respective discrete probability distribution. Use a simulation model in Excel (with @Risk) with these distributions to identify the better plan. Explain your results and compare them with the results in questions 1 and 2.