

Probabilities from the Normal Distribution

Learn / Courses / Introduction to Statistics in Python

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Daily XP 708

Exercise

Probabilities from the normal distribution

Since each deal Amir worked on (both won and lost) was different, each was worth a different amount of money. These values are stored in the `amount` column of `amir_deals` and follow a normal distribution with a mean of 5000 dollars and a standard deviation of 2000 dollars. As part of his performance metrics, you want to calculate the probability of Amir closing a deal worth various amounts.

`norm` from `scipy.stats` is imported as well as `pandas` as `pd`. The DataFrame `amir_deals` is loaded.

Instructions 2/4

25 XP

✓ What's the probability of Amir closing a deal worth less than \$7500?

2 What's the probability of Amir closing a deal worth more than \$1000?

Take Hint (-7 XP)

3 What's the probability of Amir closing a deal worth between \$3000 and \$7000?

4 What amount will 25% of Amir's sales be less than?

script.py

Light Mode

```
1 # Probability of deal > 1000
2 prob_over_1000 = ____
3
4 print(prob_over_1000)
```

Run Code Submit Answer

IPython Shell

Slides

<script.py> output:
0.894358226331446

In [1]:

Question:

What's the probability of Amir closing a deal worth more than \$1000?
Given: Amir's deals follow a normal distribution with a mean of 5000 dollars and a standard deviation of 2000 dollars.

Explanation of the Question:

This task involves calculating the probability of closing a deal worth more than 1000 dollars using a normal distribution. The probability for values

greater than a given number is determined by subtracting the CDF value at that number from 1.

Answer:

```
from scipy.stats import norm
```

```
# Calculate the probability of closing a deal worth more than $1000  
prob_over_1000 = 1 - norm.cdf(1000, loc=5000, scale=2000)
```

```
print(prob_over_1000)
```

Explanation of the Answer:

The `norm.cdf` function calculates the cumulative probability of values less than 1000 in a normal distribution (mean=5000, std=2000). Subtracting this value from 1 gives the probability of values greater than 1000. This result indicates the likelihood of closing a deal exceeding \$1000.