Question 1: Simulate 30 rolls with =RANDBETWEEN(1,6). What is the probability of rolling a 3 exactly 5 ti
BINOM.DIST)

Answer:
6
2
1
5
1
5
5
3
1
4
3
1
2
6
3
3
4
1
3
1
5
1
5
6
6
3
4
1
2
2

Total no. of 3s in above random events:
6

By binomial distribution:
0.19210813

Question 2: Generate 100 values in Excel using the continuous uniform distribution RAND() and plo
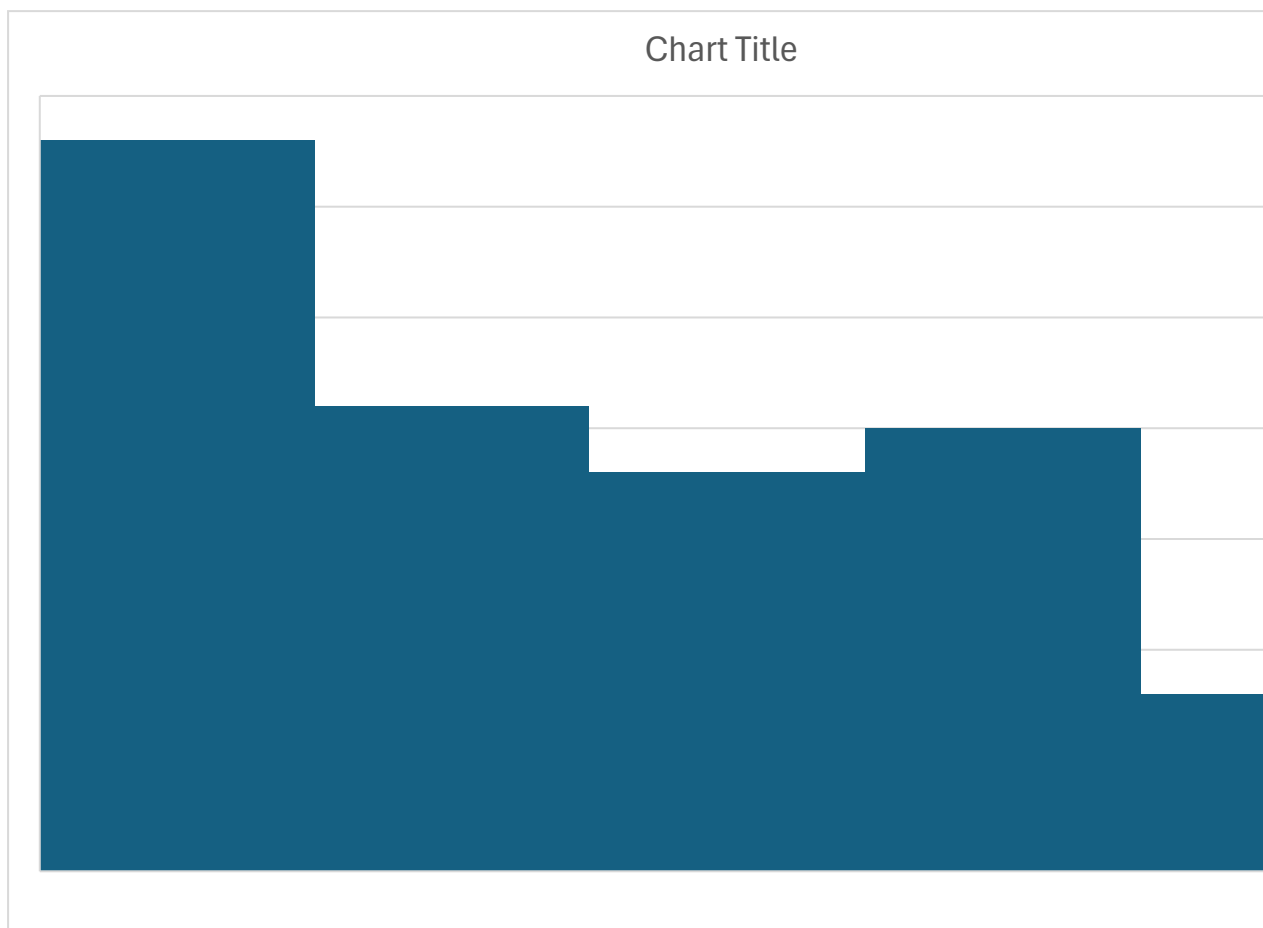histogram.
Describe the shape of the distribution.

Answer:

0.84789462
0.28736392
0.12373896
0.20623843
0.05632719
0.41756987
0.55180261
0.14383071
0.91723547
0.24522201
0.79412849
0.19571941
0.6279876
0.66240725
0.83342695
0.53842953
0.70174294
0.51720244
0.90413842
0.97808105
0.24747633
0.48593736
0.38536226
0.10903639
0.94796734
0.16048885
0.94951127
0.7980193
0.06223851
0.95630238
0.68222593
0.06683139
0.38302303
0.91657829
0.24095301
0.95648499
0.13840047
0.77431181
0.73363976
0.94935214
0.07156262
0.74744558

0.8751231
0.19010365
0.65566373
0.34128159
0.07532914
0.31941279
0.90543653
0.71377861
0.66528734
0.0729299
0.30723444
0.71294199
0.03796356
0.03677469
0.06249331
0.45280079
0.80027815
0.83327798
0.01711367
0.43102552
0.18875135
0.34244411
0.0733734
0.402682
0.34296572
0.32156778
0.1637411
0.64649083
0.0954462
0.61089904
0.03133997
0.21574316
0.75835628
0.04875981
0.60018785
0.0296093
0.76215389
0.67205135
0.34904405
0.54388007
0.43475387
0.25158942
0.9970075
0.56549476

0.1198345
0.77835698
0.27129116
0.14231434
0.07215056
0.60842087
0.62144242
0.42107529
0.02656469
0.42587979
0.8862423
0.42786722
0.94153037
0.07100182

Chart Title

* The histogram shows a uniform distribution
* Values are evenly spread between 0 and 1
* No skewness or peak observed

Question 3: A dataset has a mean of 50 and a standard deviation of 5. What percentage of values lie
and 55 if the data follows a normal distribution?

Answer:

Given:

Mean = 50

Standard Deviation = 5

Step 1: Calculate Z-scores

For 45:

-1

Result = -1

For 55:

1

Result = 1

Percentage of values that lie between 45 and 55 if the data follows a normal distribution:

 0.68268949 or 68%

Question 4: What is the concept of standardization (z-score), and why is it important in data analysi
the formula and how standardization transforms a dataset.

Answer:

The formula for z score is X-mean/sd. A standardized measure of how many standard deviations a da
from the mean.

Formula =(X-AVERAGE(range))/STDEV.P(range)

concept of standardization, or calculating a z-score, involves transforming data points in a dataset t
scale without distorting differences in the distribution.   **Importa**

analysis: * I

Outliers: Data points with a z-score typically above 3 or below -3 are often considered outliers.

* Probability Calculation: In a normal distribution, z-scores can be used to easily determine the prob
value occurring within a certain range.

* Comparing Diverse Data: It provides a universal measure of relative standing, making it possible to
performance across different metrics (e.g., comparing test scores from two different exams with dif
grading scales).

Question 5: What is Kurtosis and their type?

Answer:

Kurtosis measures a distribution's "tailedness" or the presence of outliers, indicating how heavy or l
are compared to a normal distribution, with three main types:

Excel Formula : =KURT(range)

1. Mesokurtic (Kurtosis = 3):

Shape: Similar to a normal distribution, with moderate tails and peak.

Meaning: Represents a moderate level of risk or data fluctuation.

2. Leptokurtic (Kurtosis > 3):

Shape: Sharper peak and heavier, fatter tails.

Meaning: Higher probability of extreme values (outliers), indicating higher risk (e.g., financial assets swings).

3. Platykurtic (Kurtosis < 3):

Shape: Flatter peak and lighter, thinner tails.

Meaning: Lower probability of extreme values, suggesting fewer outliers and lower risk or more stabl

Question 6: Explain why the uniform distribution is a good model for the outcome of rolling a fair die

Answer:

The outcomes are all equally likely.

die has six sides, each with a different number of pips (1 through 6). The term "fair" means that there towards any one side landing face up. Therefore, the probability of rolling any specific number from A uniform distribution is defined as a probability distribution where all outcomes in the sample spac probable, perfectly matching this scenario.

Question 7: Use Excel to compute the probability of getting at least 8 successes in 15 trials with suc probability 0.5

Answer:

Given:

n = 15

p = 0.5

By formula:

  0.5

Question 8: How does log transformation help in stabilizing variance and making data more normall distributed?

Answer:

* Log transformation reduces skewness

* Stabilizes variance

* Makes data closer to normal distribution