**Task -1**

**Question 1:** Blood glucose levels for obese patients have a mean of 100 with a standard deviation of 15.

A researcher thinks that a diet high in raw cornstarch will have a positive effect on blood glucose levels.

A sample of 36 patients who have tried the raw cornstarch diet have a mean glucose level of 108.

Test the hypothesis that the raw cornstarch had an effect or not.

**Answer :**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Solution | Mean | 100 |  |  |
|  | STD | 15 |  |  |
|  | Sample | 36 |  |  |
|  | level | 108 |  |  |
|  |  |  |  |  |
|  | STD | 15 |  |  |
|  | Z Calculation | 8 |  |  |
|  | 2.5 |  |  |
|  |  |  |  |
|  | Z\_Values | 3.2 | Z Value is Greater than 1.64 | |
|  |  |  |  |  |
|  | Reject the null hypothesis | | |  |

**Question2 :** In one state, 52% of the voters are Republicans, and 48% are Democrats.

In a second state, 47% of the voters are Republicans, and 53% are Democrats.

Suppose a simple random sample of 100 voters are surveyed from each state.

What is the probability that the survey will show a greater percentage of Republican voters in the second state than in the first state?

**Answer :**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1\_State\_R | 52 |  |  |  |  |  |
| 1\_State\_D | 48 |  |  |  |  |  |
| 2\_State\_R | 47 |  |  |  |  |  |
| 2\_State\_D | 53 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| the mean of the difference in sample proportions | | | | | 0.05 |  |
| Find the standard deviation of the difference | | | | |  |  |
| 1\_Value | 0.00249600 |  |  |  |  |  |
| 2\_Value | 0.00249100 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| STD Both | 0.07061869 |  |  |  |  |  |
|  |  |  |  |  |  |  |
| find the probability that p1 is less than p2. | | | | -0.708 |  |  |
|  |  |  |  |  |  |  |
| Using Normal Distribution Calculator | | | | P(z <=0.7082) = 0.24 | | |
| the probability of a z-score being -0.7082 or less is 0.24 | | | | | |  |

**Question 3:** You take the SAT and score 1100. The mean score for the SAT is 1026 and the standard deviation is 209.

How well did you score on the test compared to the average test taker?

**Answer :**

|  |  |
| --- | --- |
| SCORE | 1100.00 |
| SAT | 1026.00 |
| STD | 209.00 |
| Z-Score | 0.35 |

**Now, check the z-value from z table for the percentage of test – seeker scored.**

**A z-score of .354 is .1368 + .5000\* = .6368 or 63.68%.**