**ASSIGNMENT 3.2**

**Solution 1:**

1. Given,

Mean=6.0 and Standard Deviation=1.0

For the given breadth of 6.2, Z-score will be,

Z= (x-μ)/σ = (6.2-6.0)/1.0= 0.2

Therefore, Z-Score for 6.2 = 0.2

Using Z-tables,

Area to the left of 0.2 Z-score = 0.5793

Thus,

Likelihood of his head breadth less than 6.2 inch = 0.5793

1. Given,

n=100, mean head breath should be less than 6.2 inches

Z= (x-μ)/(σ/n^0.5)

= (6.2-6.0)/ (1.0/100^0.5)

= 0.2/0.1

= 2

Therefore,

Z-score= 2 and thus area to the left of this Z-score from Z-Tables is,

Probability (less than 6.2 for 100 samples) =0.9772.

1. Even though 97.72% of head breaths fall less than 6.2 inches, 2.28% of the people still face problems wearing these helmets.

That is,

2.28, approximately 3 people out of 100 couldn’t use this helmet.

If at all the designed size of this helmet is 6.3 inches, 99.87 people will be benefited that is approximately every person can wear this helmet without any problem.

**Solution 2:**

Null Hypothesis: Mean Penguin weight does not differ from last year

Alternate Hypothesis: Mean Penguin weight differ from last year

Given,

μ= 15.4 kg, σ=2.5 kg,

x-bar= 14.6 kg, n= 35 Penguins

Thus,

Z= (x-bar – μ)/ (σ/ sqrt(n)) = (14.6-15.4)/(2.5/sqrt(35))

= -1.89314553

At 0.05 significance level,

-1.89314553 lies within -1.96 and 1.96.

Hence,

We do not reject null hypothesis that the mean penguin weight does not differ from last year.