**ASSIGNMENT 3.1**

**Solution 1:**

Probability(True)=55.1/100=0.551

Probability(False)=1-0.551=0.449

Using Binomial Distribution as,

* Total number of trails is fixed
* Only 2 possible outcomes, True or False
* Outcomes are statistically Independent
* All the trails have same probability of success

P(X=x) = (nCx )\*(p^x)\* ((1-p)^ (n-x))

Here,

P(X=2) = nCx\*(P(True)^x)\*(P(False)^(n-x))

Therefore,

P(X=2) = (6C2) \* (0.551^2) \* (0.449^4)

= 15 \* 0.303601 \* 0.0406429362

= 0.1850886

Therefore,

Probability(Exactly 2 Voted for the proposition) = 0.1850886

**Solution 2:**

The Test Results are: 20, 15, 26, 32, 18, 28, 35, 14, 26, 22, 17

Mean of the results = ((20+15+26+32+18+28+35+14+26+22+17)/11) = 23 Marks

Standard Deviation of the results = 6.633249581

Standardising marks using Z-Score,

Z-score= (x-μ)/σ

Here,

μ= 23 and σ= 6.633249581

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S. No** | **Marks** | **Mean** | **Standard Deviation** | **Z-Score** | **Test Result** |
| 1 | 20 | 23 | 6.633249581 | -0.452267017 | Pass |
| 2 | 15 | -1.206045378 | Fail |
| 3 | 26 | 0.452267017 | Pass |
| 4 | 32 | 1.356801051 | Pass |
| 5 | 18 | -0.753778361 | Pass |
| 6 | 28 | 0.753778361 | Pass |
| 7 | 35 | 1.809068067 | Pass |
| 8 | 14 | -1.356801051 | Fail |
| 9 | 26 | 0.452267017 | Pass |
| 10 | 22 | -0.150755672 | Pass |
| 11 | 17 | -0.904534034 | Pass |

Therefore,

Students who scored 15 marks and 14 marks fall below one standard deviation away from the mean and therefore declared as “Fail” and the rest all students are declared as “Pass”.