**Stats 1 Assignment**

1. 335.9274

2. 5183.25

3. 20/100

**Stats 2 Assignment**

1. 15/20 = 0.75

2. 1/10

3. p(Red balls) - 4/10

p(Black balls) - 6/10

**Stats 3 Assignment**

1. Ho : mean = 100

Ha : mean > 100

Assume, significance level α = 0.05.

z = (108 – 100) / (15/sqrt(36)) = 3.20

p-value with z of 3.20 = 0.993. So probability of value more than or equal to 108 is (1-0.993) = 0.0007. This value is less than significance level (0.05). Hence, we reject the null hypothesis and raw cornstarch effect is present.

1. P1 = Proportion of Republican voters in first state,

P2 = Proportion of Republican voters in second state,

p1 = Proportion of Republican voters in sample from the first state

p2 = Proportion of Republican voters in the sample from the second state.

n1 = Number of voters sampled from the first state = 100

n2 = Number of voters sampled from the second state = 100

n1P1 = 100 \* 0.52 = 52,

n1(1 – P1) = 100 \* 0.48 = 48,

n2P2 = 100 \* 0.47 = 47

n2(1 – P2) = 100 \* 0.53 = 53

All sample size’s are large enough.

Mean = P1 – P2 = 0.52-0.47 = 0.05

Sd = sqrt( [ P1(1 - P1) / n1 ] + [ P2(1 - P2) / n2 ] ) = 0.0706

Z score =  (0 - 0.05)/0.0706 = -0.7082, p-value = 0.24

1. Z = (1100 – 1026) / 209 = 0.354

i.e. score is 0.354 sd above the average test taker

**Stats 4 Assignment**

1. Since the expected freq = total row \* total column / grand total

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **High School** | **Bachelors** | **Masters** | **Ph.d.** | **Total** |
| **Female** | 50.886 | 49.868 | 50.377 | 49.868 | 201 |
| **Male** | 49.114 | 48.132 | 48.623 | 48.132 | 194 |
| **Total** | 100 | 98 | 99 | 98 | 395 |

X2 =(60−50.886)2/50.886+⋯+(57−48.132)2/48.132=8.006

Deg. of freedom = (4 – 1) ( 2 – 1) = 3

Critical value of X2 with 3 degree of freedom is 7.815. Since 8.006 > 7.815, we reject the null hypothesis and conclude that the education level depends on gender at a 5% level of significance.

|  |  |
| --- | --- |
| **Decision** | Reject Ho since F > F-critical |
|  |  |
| **Effect size** |  |
| η2 | 0.62 |
|  |  |
| **APA writeup** |  |
| *F*(2, 12) = 9.75, *p* < 0.05, η2 = 0.62 |  |

1. F-test = (variance of 10, 20, 30, 40, 50) / (variance of 5, 10, 15, 20, 25) = 250 / 62.5 = 4.