**PRACTICAL: 12**

*Calculation of Type 1 and Type 2 Error*

**FORMULA USED:**

1. **ALPHA: TYPE 1 ERROR:**
2. **BETA: TYPE 2 ERROR:**

**Question:** Calculate probability of committing type 1 and type 2 errors and plot the distribution.

**Answer:**

|  |  |
| --- | --- |
| P | ALPHA |
| 0 | 0 |
| 0.05 | 3.71E-05 |
| 0.1 | 0.039891 |
| 0.15 | 0.431685 |
| 0.2 | 0.871494 |
| 0.25 | 0.988917 |
| 0.3 | 0.999595 |
| 0.35 | 0.999993 |
| 0.4 | 1 |
| 0.45 | 1 |
| 0.5 | 1 |
| 0.55 | 1 |
| 0.6 | 1 |
| 0.65 | 1 |
| 0.7 | 1 |
| 0.75 | 1 |
| 0.8 | 1 |
| 0.85 | 1 |
| 0.9 | 1 |
| 0.95 | 1 |
| 0.99 | 1 |

**GRAPH:**

|  |  |
| --- | --- |
| P | BETA |
| 0 | 1 |
| 0.05 | 0.999864 |
| 0.1 | 0.927427 |
| 0.15 | 0.457224 |
| 0.2 | 0.080444 |
| 0.25 | 0.005421 |
| 0.3 | 0.000157 |
| 0.35 | 2.09E-06 |
| 0.4 | 1.29E-08 |
| 0.45 | 3.59E-11 |
| 0.5 | 4.14E-14 |
| 0.55 | 1.77E-17 |
| 0.6 | 2.32E-21 |
| 0.65 | 7.16E-26 |
| 0.7 | 3.47E-31 |
| 0.75 | 1.39E-37 |
| 0.8 | 1.57E-45 |
| 0.85 | 6.51E-56 |
| 0.9 | 1.03E-70 |
| 0.95 | 2.81E-96 |
| 0.99 | 3.8E-156 |

**GRAPH:**

**INFERENCE:**

1. As it is observable Alpha, the probability of causing type 1 error increases as p increases.
2. Where Beta, the probability of causing Type 2 distribution decreases as p increases.