

| Model Performance Comparison: Precision, Recall, and F1 Score across Three Scenarios | | | | | | | | | | | | | | | |
|--|-------------|----------|------------|-------------|----------|------------|-------------|----------|------------|---------------------|------------------|--------------------|------------------------|---------------------|-----------------------|
| Model | Scenario 0 | | | Scenario 1 | | | Scenario 2 | | | Macro Averages | | Weighted Averages | | Overall Performance | |
| | Precision_0 | Recall_0 | F1-score_0 | Precision_1 | Recall_1 | F1-score_1 | Precision_2 | Recall_2 | F1-score_2 | macro_avg_precision | macro_avg_recall | macro_avg_F1-score | weighted_avg_precision | weighted_avg_Recall | weighted_avg_F1-score |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| Bert_base_uncased-old | 0.79 | 0.62 | 0.69 | 0.9 | 0.97 | 0.94 | 0.46 | 0.18 | 0.26 | 0.72 | 0.59 | 0.63 | 0.86 | 0.88 | 0.86 |
| Bert_base with class weight | 0.75 | 0.7 | 0.73 | 0.9 | 0.95 | 0.93 | 0.65 | 0.41 | 0.5 | 0.77 | 0.69 | 0.72 | 0.86 | 0.87 | 0.86 |
| Bert_base_under_sampling | 0.82 | 0.78 | 0.8 | 0.8 | 0.86 | 0.83 | 0.65 | 0.58 | 0.61 | 0.76 | 0.74 | 0.75 | 0.78 | 0.78 | 0.78 |
| | | | | | | | | | | | | | | | |
| DistilBert-base-uncased-old | 0.77 | 0.6 | 0.68 | 0.9 | 0.97 | 0.93 | 0.52 | 0.16 | 0.25 | 0.73 | 0.58 | 0.62 | 0.85 | 0.88 | 0.86 |
| DistilBert-with class weghit | 0.77 | 0.69 | 0.73 | 0.9 | 0.96 | 0.93 | 0.7 | 0.38 | 0.49 | 0.79 | 0.68 | 0.72 | 0.87 | 0.87 | 0.87 |
| DistilBert-under_sampling | 0.81 | 0.81 | 0.81 | 0.8 | 0.86 | 0.83 | 0.65 | 0.54 | 0.59 | 0.75 | 0.73 | 0.74 | 0.78 | 0.78 | 0.78 |
| | | | | | | | | | | | | | | | |
| AlBert-old | 0.77 | 0.6 | 0.68 | 0.9 | 0.97 | 0.93 | 0.52 | 0.16 | 0.25 | 0.73 | 0.58 | 0.62 | 0.85 | 0.88 | 0.86 |
| AlBertwith-class weight | 0.76 | 0.66 | 0.71 | 0.89 | 0.96 | 0.92 | 0.68 | 0.28 | 0.4 | 0.78 | 0.64 | 0.68 | 0.85 | 0.87 | 0.85 |
| AlBert- under_sampling | 0.79 | 0.8 | 0.8 | 0.8 | 0.85 | 0.83 | 0.64 | 0.51 | 0.57 | 0.74 | 0.72 | 0.73 | 0.77 | 0.77 | 0.77 |
| | | | | | | | | | | | | | | | |
| Robart-old | 0.83 | 0.67 | 0.74 | 0.9 | 0.97 | 0.94 | 0.53 | 0.2 | 0.29 | 0.75 | 0.62 | 0.66 | 0.87 | 0.89 | 0.87 |
| Robart-with class weight | 0.77 | 0.67 | 0.71 | 0.89 | 0.96 | 0.93 | 0.67 | 0.34 | 0.45 | 0.78 | 0.66 | 0.7 | 0.86 | 0.87 | 0.86 |
| Robart-with under sampling | 0.81 | 0.81 | 0.81 | 0.81 | 0.87 | 0.84 | 0.68 | 0.54 | 0.6 | 0.76 | 0.74 | 0.75 | 0.78 | 0.79 | 0.78 |