**Title as query cases:**

**Loss values:**

Normal BERT One Positive One Negative CrossEntropyLoss

Epoch 1 Loss: 201.5463}

Epoch 2 Loss: 50.3765}

Epoch 2 Loss: 14.2371}

MULTI POS AND NEG TripletMarginLoss

Epoch 1, Average Loss: 0.9734

Epoch 2, Average Loss: 0.5140

Epoch 3, Average Loss: 0.2892

Reranker loss:

INFO:\_\_main\_\_:Epoch: 0, Step: 0, Loss: 2.6059, Dual Loss: 1.9478, Cross Loss: 0.6581

INFO:\_\_main\_\_:Epoch 0 completed. Average loss: 2.9028

INFO:\_\_main\_\_:Epoch: 1, Step: 0, Loss: 2.7043, Dual Loss: 2.0350, Cross Loss: 0.6693

INFO:\_\_main\_\_:Epoch 1 completed. Average loss: 2.9226

INFO:\_\_main\_\_:Epoch: 2, Step: 0, Loss: 2.9689, Dual Loss: 2.3069, Cross Loss: 0.6620

INFO:\_\_main\_\_:Epoch 2 completed. Average loss: 2.9970

**Calculated Metrics:**

Mean Metrics: (normal bert wot training 25000)

map: 0.0373

P\_10: 0.0548

recall\_5: 0.0358

recall\_10: 0.0725

recall\_15: 0.0725

recall\_20: 0.0725

recall\_30: 0.0725

recall\_100: 0.0725

recall\_200: 0.0725

recall\_500: 0.0725

recall\_1000: 0.0725

ndcg\_cut\_10: 0.0700

Mean Metrics: (normal bert wot training 50000)

map: 0.0198

P\_10: 0.0613

recall\_5: 0.0156

recall\_10: 0.0562

recall\_15: 0.0562

recall\_20: 0.0562

recall\_30: 0.0562

recall\_100: 0.0562

recall\_200: 0.0562

recall\_500: 0.0562

recall\_1000: 0.0562

ndcg\_cut\_10: 0.0556

normalization added :

Mean Metrics: (normal bert wot training 50000)

Retrieval Metrics: (Normal Bert trained 25000)

map: 0.0744

P\_10: 0.0774

recall\_5: 0.1248

recall\_10: 0.1528

recall\_15: 0.1528

recall\_20: 0.1528

recall\_30: 0.1528

recall\_100: 0.1528

recall\_200: 0.1528

recall\_500: 0.1528

recall\_1000: 0.1528

ndcg\_cut\_10: 0.1340

Retrieval Metrics: (Normal Bert trained 50000)

map: 0.0553

P\_10: 0.0903

recall\_5: 0.1017

recall\_10: 0.1350

recall\_15: 0.1350

recall\_20: 0.1350

recall\_30: 0.1350

recall\_100: 0.1350

recall\_200: 0.1350

recall\_500: 0.1350

recall\_1000: 0.1350

ndcg\_cut\_10: 0.1258

Evaluation Results: (multi pos and negs 50000)

ndcg: 0.068

map: 0.039

ndcg\_cut\_5: 0.097

recall\_10: 0.059

recall\_5: 0.059

P\_10: 0.048

P\_5: 0.097

ndcg\_cut\_10: 0.076

Evaluation Results: (just BERT tokenizer 50000)

"statistics": {

"map": {

"mean": 0.010272657450076803,

"std\_dev": 0.05002502391139824,

"min": 0.0,

"max": 0.27678571428571425,

"num\_queries": 31

},

"bpref": {

"mean": 0.01935483870967742,

"std\_dev": 0.09099214192705389,

"min": 0.0,

"max": 0.5,

"num\_queries": 31

},

"P\_10": {

"mean": 0.016129032258064516,

"std\_dev": 0.0637535577754862,

"min": 0.0,

"max": 0.3,

"num\_queries": 31

},

"recall\_10": {

"mean": 0.01935483870967742,

"std\_dev": 0.09099214192705389,

"min": 0.0,

"max": 0.5,

"num\_queries": 31

},

"ndcg\_cut\_10": {

"mean": 0.02270208275074654,

"std\_dev": 0.09572732273377534,

"min": 0.0,

"max": 0.4989303177545519,

"num\_queries": 31

}

}

Retrieval Metrics(SBERT, 50000 Faiss)

map: 0.1211

P\_10: 0.2065

recall\_5: 0.1239

recall\_10: 0.2379

recall\_15: 0.2379

recall\_20: 0.2379

recall\_30: 0.2379

recall\_100: 0.2379

recall\_200: 0.2379

recall\_500: 0.2379

recall\_1000: 0.2379

ndcg\_cut\_10: 0.2447

Evaluation Metrics : (Rerank, 50000 (cross ve dual encoder))

map: 0.0023

ndcg\_10: 0.0094

recall\_10: 0.0114

P\_10: 0.0129

**100000 documents tests**

Retrieval Metrics:(normal BERT trained 100000)

map: 0.0410

P\_10: 0.1419

recall\_5: 0.0404

recall\_10: 0.0939

recall\_15: 0.0939

recall\_20: 0.0939

recall\_30: 0.0939

recall\_100: 0.0939

recall\_200: 0.0939

recall\_500: 0.0939

recall\_1000: 0.0939

ndcg\_cut\_10: 0.1443

Mean Metrics:(normal BERT wot fine tune 100000)

map: 0.0047

P\_10: 0.0452

recall\_5: 0.0011

recall\_10: 0.0175

recall\_15: 0.0175

recall\_20: 0.0175

recall\_30: 0.0175

recall\_100: 0.0175

recall\_200: 0.0175

recall\_500: 0.0175

recall\_1000: 0.0175

ndcg\_cut\_10: 0.0336

Retrieval Metrics: (SBERT wot fine tune 200000)

map: 0.0743

P\_10: 0.3645

recall\_5: 0.0694

recall\_10: 0.1320

recall\_15: 0.1320

recall\_20: 0.1320

recall\_30: 0.1320

recall\_100: 0.1320

recall\_200: 0.1320

recall\_500: 0.1320

recall\_1000: 0.1320

ndcg\_cut\_10: 0.3656

**Description as query cases:**

**Reranker loss**

INFO:\_\_main\_\_:Epoch: 0, Step: 0, Loss: 2.8924, Dual Loss: 2.1566, Cross Loss: 0.7358

INFO:\_\_main\_\_:Epoch 0 completed. Average loss: 2.7843

INFO:\_\_main\_\_:Epoch: 1, Step: 0, Loss: 2.8065, Dual Loss: 2.0780, Cross Loss: 0.7285

INFO:\_\_main\_\_:Epoch 1 completed. Average loss: 2.8012

INFO:\_\_main\_\_:Epoch: 2, Step: 0, Loss: 2.8521, Dual Loss: 2.1262, Cross Loss: 0.7259

INFO:\_\_main\_\_:Epoch 2 completed. Average loss: 2.7424

Retrieval Metrics: (normal BERT trained , 50000)

map: 0.0796

P\_10: 0.1194

recall\_5: 0.1161

recall\_10: 0.1729

recall\_15: 0.1729

recall\_20: 0.1729

recall\_30: 0.1729

recall\_100: 0.1729

recall\_200: 0.1729

recall\_500: 0.1729

recall\_1000: 0.1729

ndcg\_cut\_10: 0.1556

Retrieval Metrics: (normal BERT trained , 100000)

map: 0.0627

P\_10: 0.1484

recall\_5: 0.0632

recall\_10: 0.1136

recall\_15: 0.1136

recall\_20: 0.1136

recall\_30: 0.1136

recall\_100: 0.1136

recall\_200: 0.1136

recall\_500: 0.1136

recall\_1000: 0.1136

ndcg\_cut\_10: 0.1728

Retrieval Metrics: (normal BERT wot training , 50000)

Mean Metrics:

map: 0.0079

P\_10: 0.0161

recall\_5: 0.0054

recall\_10: 0.0269

recall\_15: 0.0269

recall\_20: 0.0269

recall\_30: 0.0269

recall\_100: 0.0269

recall\_200: 0.0269

recall\_500: 0.0269

recall\_1000: 0.0269

ndcg\_cut\_10: 0.0165

Retrieval Metrics: (normal BERT wot training , 100000)

Retrieval Metrics: (reranker , 50000)

map: 0.0073

ndcg\_10: 0.0203

recall\_10: 0.0180

P\_10: 0.0161

Retrieval Metrics: (reranker, 100000)

Retrieval Metrics: (SBERT , 50000)

Retrieval Metrics: (SBERT, 100000)