### RETRIEVAL ENSEMBLE

Homework 3

BLM5109 Collective Learning
ÖNDER GÖRMEZ
21501035



I. 50 Sample

III. 2000 Sample

V. References

II. 200 Sample

**IV. Conclusions** 

I. 50 Sample

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# **Embedding Elapsed Times for 50 Sample**

Multilingual E5 Large

dbmdz Turkish BERT

### **Turkish Instructions Dataset**

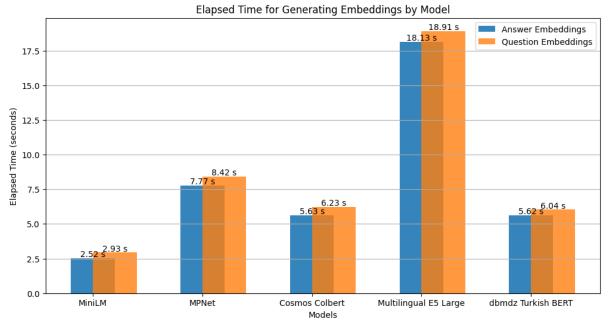
# Elapsed Time for Generating Embeddings by Model 8.15 s Answer Embeddings Question Embeddings Question Embeddings 2.30 s 1.00 s 0.92 s 0.99 s

Cosmos Colbert

Models

MiniLM

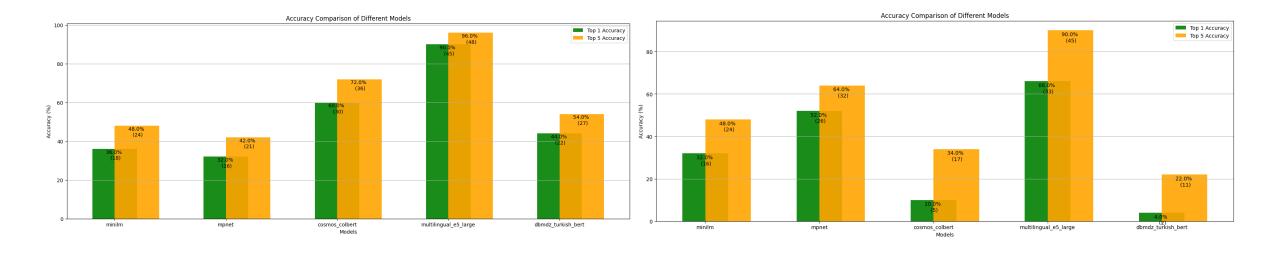
MPNet





# Accuracy Comparison for 50 Sample

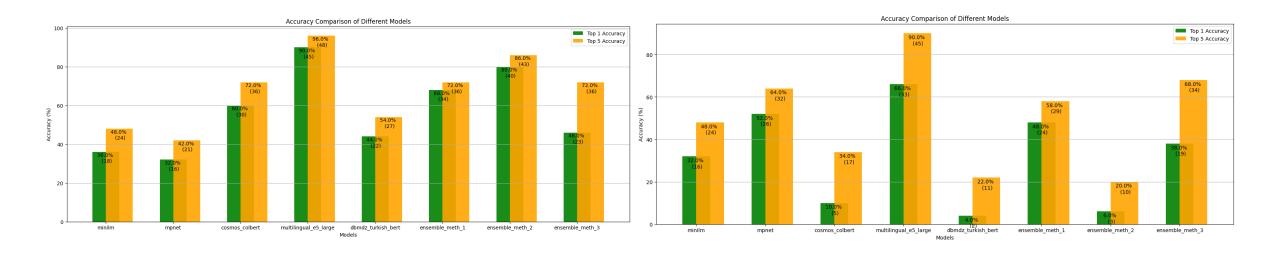
### **Turkish Instructions Dataset**





# Accuracy Comparison with Ensemble for 50 Sample

### **Turkish Instructions Dataset**



I. 50 Sample

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II. 200 Sample

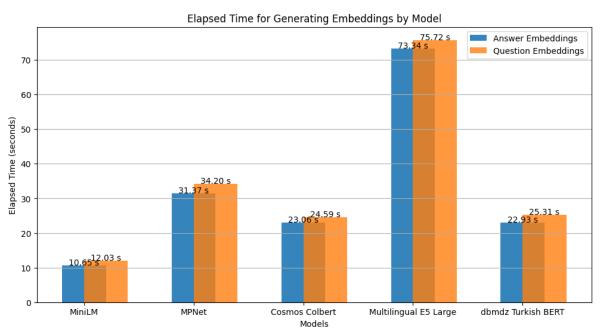
**IV. Conclusions** 



# **Embedding Elapsed Times for 200 Sample**

### **Turkish Instructions Dataset**

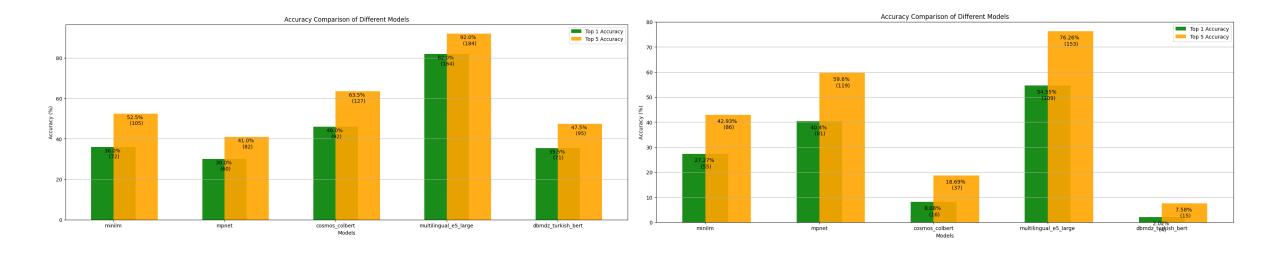
# Elapsed Time for Generating Embeddings by Model 40 31.72 s 32.86 s 10.46 \$ 66 s MiniLM MPNet Cosmos Colbert Models Answer Embeddings Question Embeddings Answer Embeddings Question Embeddings Question Embeddings Question Embeddings Answer Embeddings Question Embeddings Question Embeddings Question Embeddings Answer Embeddings Question Embeddings Question Embeddings Answer Embeddings Question Embeddings Answer Embeddings Question Embeddings Question Embeddings Answer Embeddings Question Embeddings Answer Embedding





# Accuracy Comparison for 200 Sample

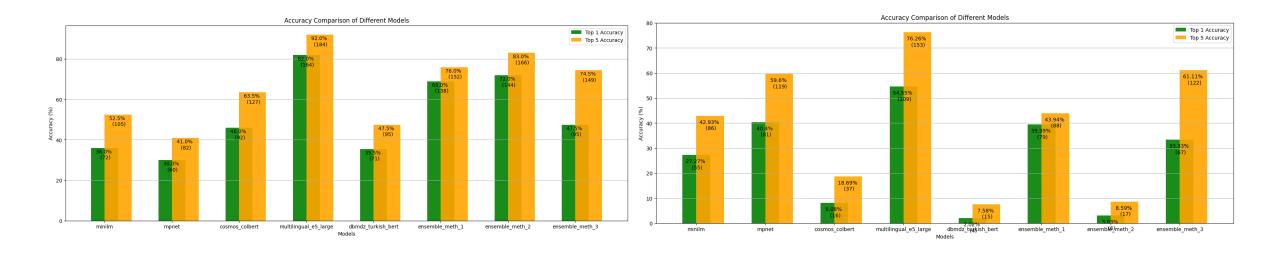
### **Turkish Instructions Dataset**





# Accuracy Comparison with Ensemble for 200 Sample

### **Turkish Instructions Dataset**



I. 50 Sample

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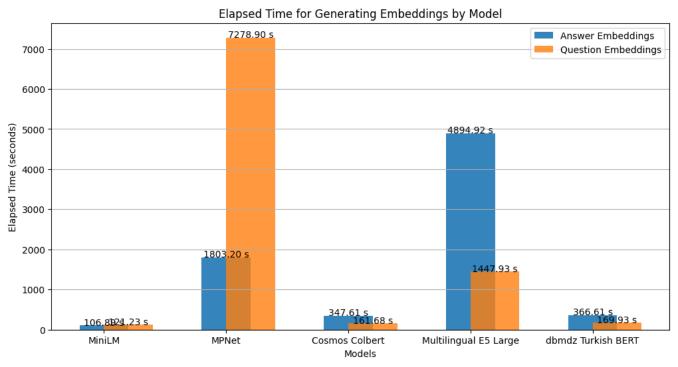
II. 200 Sample

**IV. Conclusions** 



# **Embedding Elapsed Times for 2000 Sample**

### **Turkish Instructions Dataset**



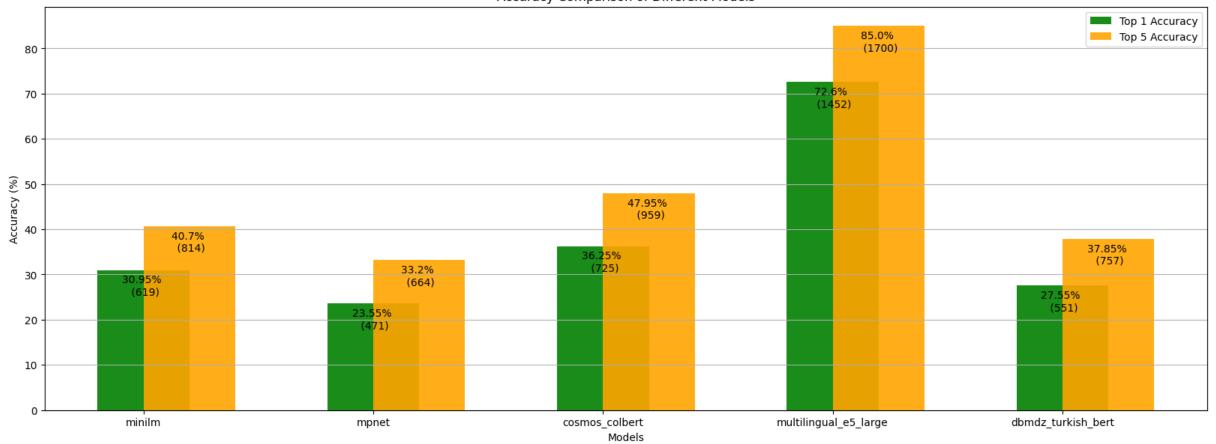
Model	Question (sec.)	Question (min.)	Answer (sec.)	Answer Süresi (min.)
all-MiniLM-L12-v2	121	2	106	1
all-mpnet-base-v2	7278	121	1803	30
ytu-ce-cosmos/turkish-colbert	161	2	347	6
Multilingual-E5-large-instruct	1447	24	4894	81
bert-base-turkish-cased	169	2	366	6
Total	9176	153	7516	124



# Accuracy Comparison for 2000 Sample

### **Turkish Instructions Dataset**

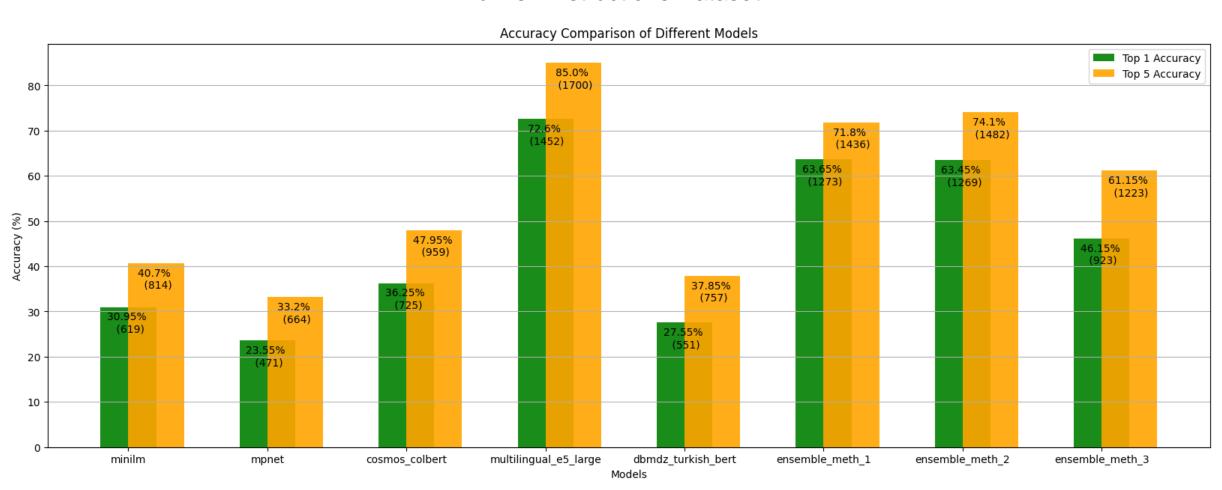
Accuracy Comparison of Different Models





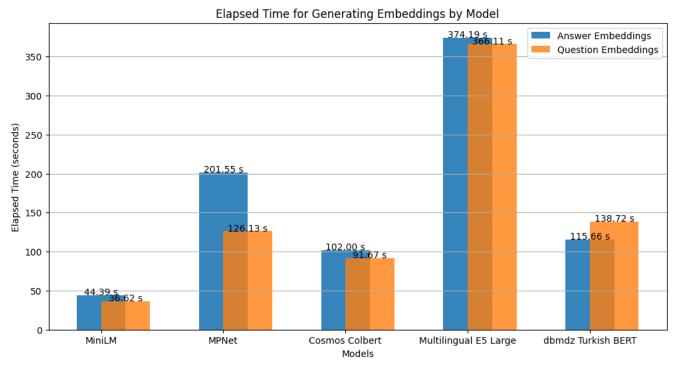
# Accuracy Comparison with Ensemble for 2000 Sample

### **Turkish Instructions Dataset**





# **Embedding Elapsed Times for 2000 Sample**

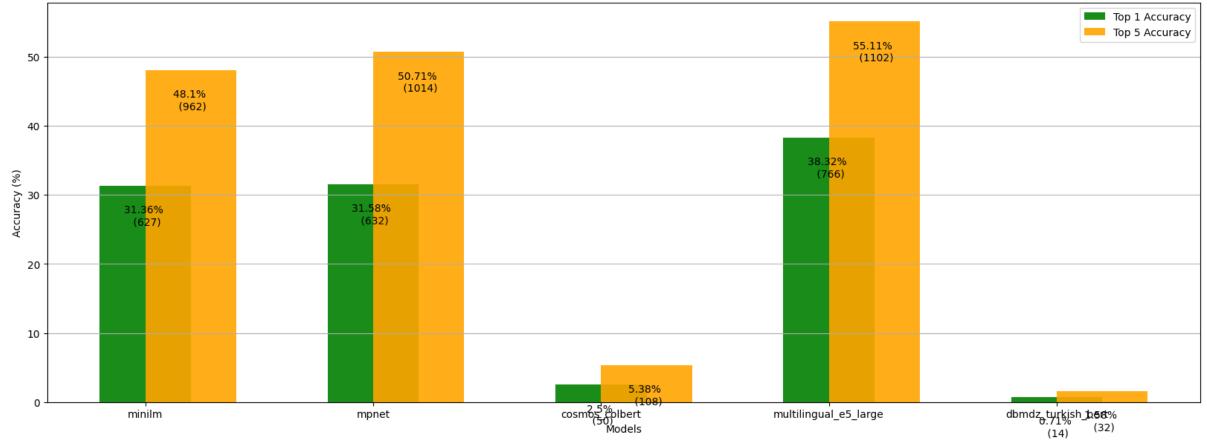


Model	Question (sec.)	Question (min.)	Answer (sec.)	Answer Süresi (min.)
all-MiniLM-L12-v2	36	0	44	0
all-mpnet-base-v2	126	2	201	3
ytu-ce-cosmos/turkish-colbert	91	1	102	1
Multilingual-E5-large-instruct	366	6	374	6
bert-base-turkish-cased	138	2	115	1
Total	757	12	836	13



# Accuracy Comparison for 2000 Sample

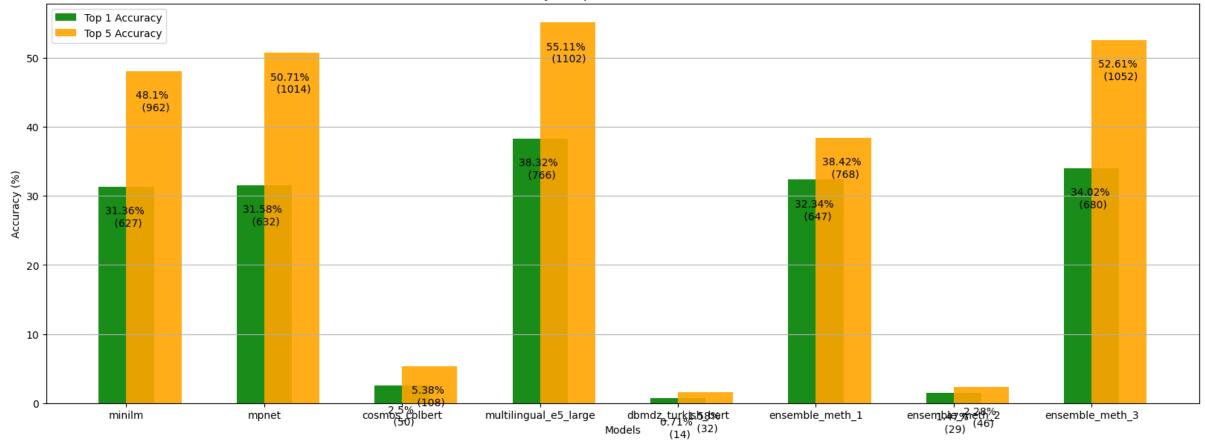






# Accuracy Comparison with Ensemble for 2000 Sample



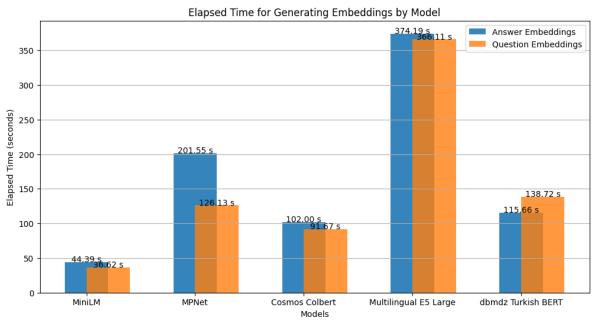




# **Embedding Elapsed Times for 2000 Sample**

### **Turkish Instructions Dataset**

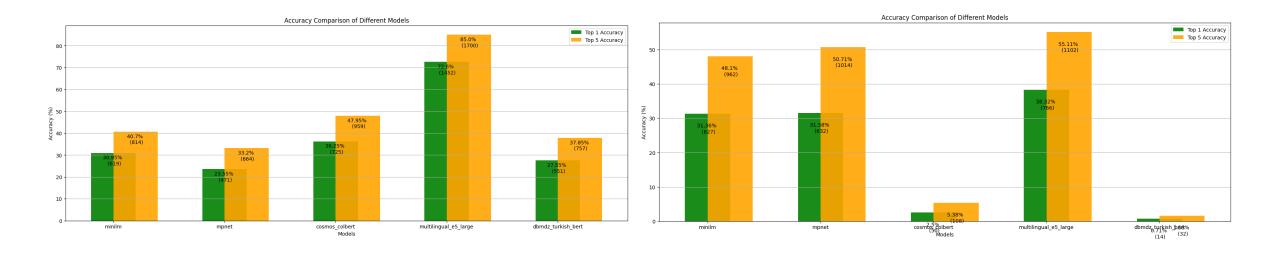
### 





# Accuracy Comparison for 2000 Sample

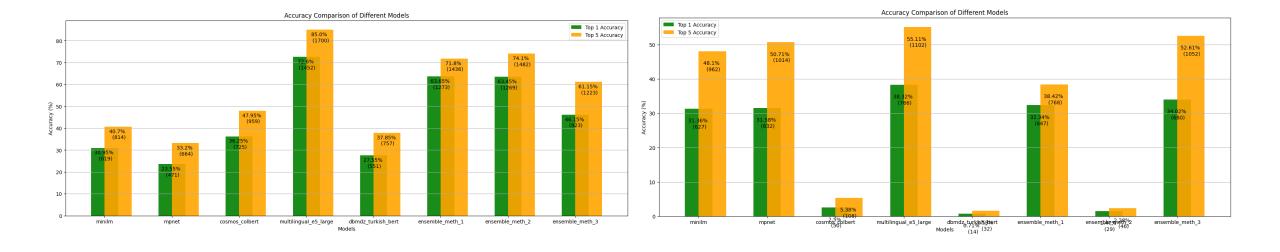
### **Turkish Instructions Dataset**





# Accuracy Comparison with Ensemble for 2000 Sample

### **Turkish Instructions Dataset**



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**IV. Conclusions** 



### **Conclusions**

- En başarılı model multilingual-e5-large
- Her model her dataset için uygun değildir.
  - cosmos/turkish-colbert
  - turkish-bert
- Veri seti ön işleme modelin çalışabilmesi / performansı için önemlidir.
- Ensemble yönteminin başarısı veri seti ve modellere bağlıdır.

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### References

- [1] turkish\_instructions
- [2] trivia qa
- [3] <u>all-MiniLM-L12-v2</u>
- [4] all-mpnet-base-v2
- [5] turkish-colbert
- [6] multilingual-e5-large-instruct
- [7] bert-base-turkish-cased

I. 50 Sample

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Q&A





### THANK YOU FOR LISTENING...