# Depression Detection

- Week 20

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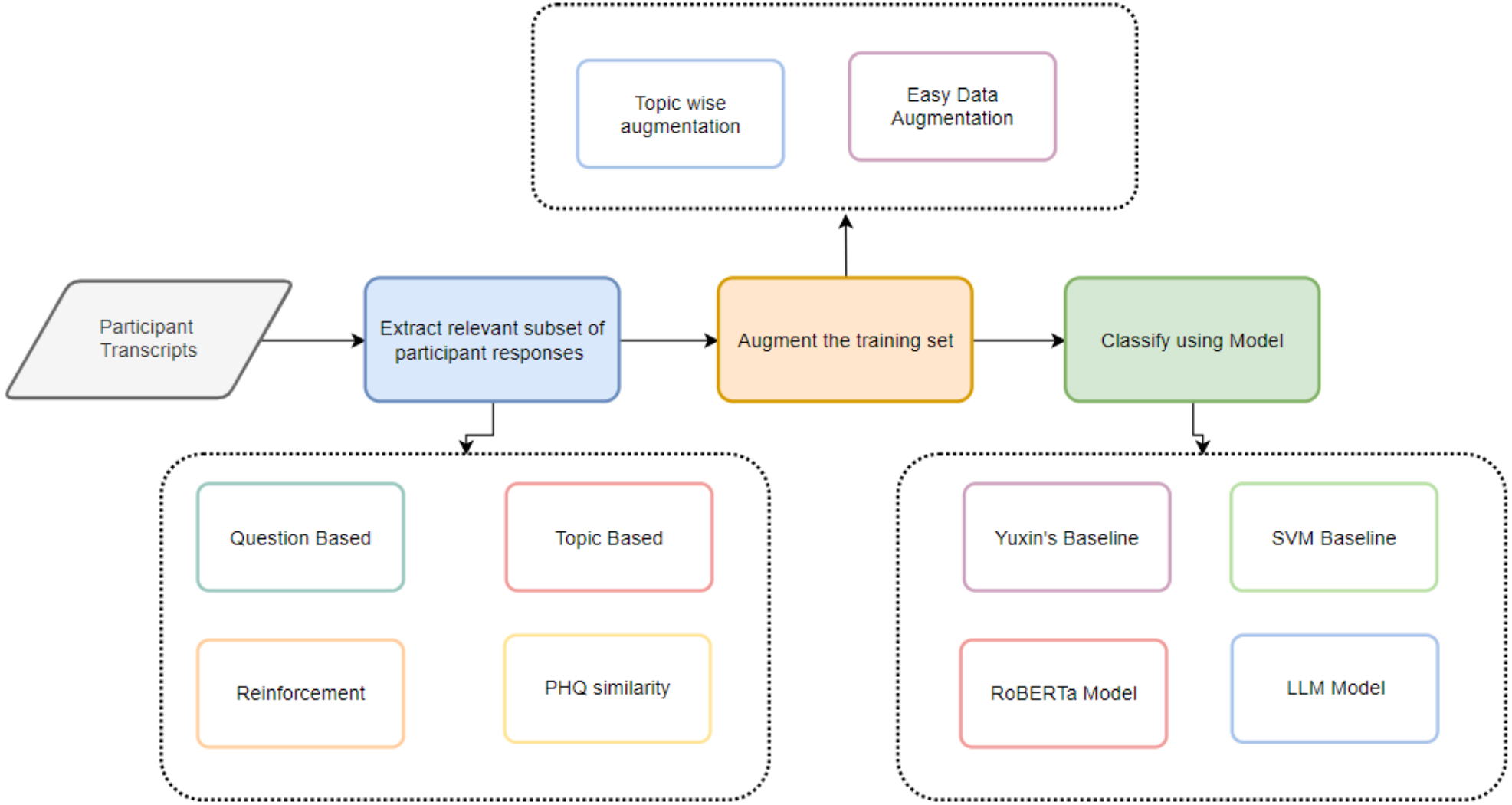
Undergraduate 4th year

Duration of the presentation: ~10 minutes

# Overall State of Work



# Agenda

1. **Few Shot LLM – Example Selection Modification**
2. **Few Shot LLM – Prompt modification**
3. **Few Shot LLM – Label Prediction**
    1. Prompt and method change
    2. Result comparisons
4. **LoRA on LLM**
5. **Data Augmentation: Modifications**
6. **Tentative Plan for next week**

# Few Shot LLM – Example Selection Modification

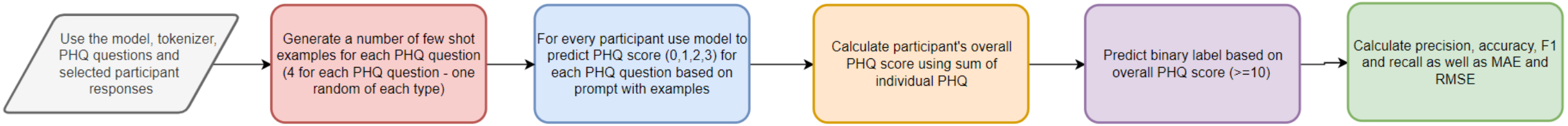



Fig 1: Few Shot LLM method

**Issue:**
A number of garbled values (9,526..)

**Method of handling:**
Deleted rows with random values

Table 1: Comparison with different ways of fewshot selection

| Model | Acc | F1 | Recall | Precision | RMSE | Over | Under |
|---|---|---|---|---|---|---|---|
| Few shot random | 0.72 | 0.37 | 0.27 | 0.58 | 6.09 | 0.45 | 0.46 |
| Few shot all types | 0.46 | 0.42 | 0.72 | 0.30 | 7.72 | 0.73 | 0.22 |

# Few Shot LLM – Prompt modification

**Prompt:** If you were a clinician providing a diagnosis for the PHQ symptom: {question}
where some example responses and labels are {fewshotexamples}
Where 0 represents hardly any symptoms, 1 represents mild symptoms, 2 represents moderate symptoms and 3 represents severe symptoms.
For the set of selected participant responses, Participant Response: {response} Based on the level provide only a single number 0, 1, 2 or 3 as a response.

Table 2: Comparison of fewshot approaches with prompt modification approach

| Model | Accuracy | F1 | Recall | Precision | RMSE | Over | Under |
|---|---|---|---|---|---|---|---|
| Few shot random | 0.72 | 0.37 | 0.27 | 0.58 | 6.09 | 0.45 | 0.46 |
| Few shot all types | 0.46 | 0.42 | 0.72 | 0.30 | 7.72 | 0.73 | 0.22 |
| Few shot description | 0.67 | 0.52 | 0.61 | 0.46 | 5.84 | 0.62 | 0.29 |

# Few Shot LLM – Label Prediction

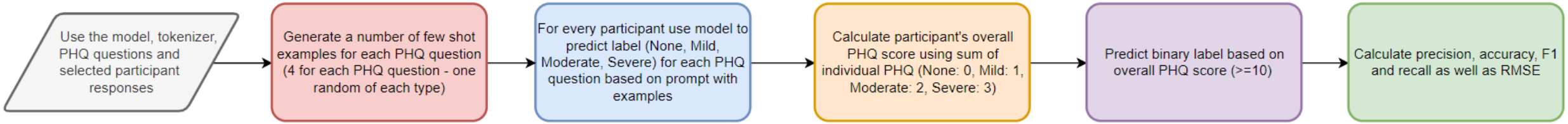



Fig 2: Few Shot LLM method – label prediction

**Prompt:**
If you were a clinician providing a diagnosis for the PHQ symptom: {question}
where some example responses and labels are {fewshotexamples}
Where 0 represents hardly any symptoms, 1 represents mild symptoms, 2 represents moderate symptoms and 3 represents severe symptoms.
For the set of selected participant responses, Participant Response: {response} Based on the level provide only a single label None, Mild, Moderate or Severe as a response.

# Few Shot LLM – Label Prediction

Table 3: Comparison of all LLM methods tried – last 3 from this week

| Model | Accuracy | F1 | Recall | Precision | RMSE |
|---|---|---|---|---|---|
| Zero Shot | 0.58 | 0.49 | 0.68 | 0.39 | 6.82 |
| Zero Shot Mild | 0.66 | 0.24 | 0.18 | 0.34 | 6.63 |
| Binary | 0.60 | 0.48 | 0.62 | 0.40 | - |
| Few Shot 4 random | **0.73** | 0.35 | 0.25 | **0.58** | 6.09 |
| Few Shot 4 all types | 0.46 | 0.42 | **0.72** | 0.30 | 7.72 |
| Few Shot prompt mod | 0.67 | **0.52** | 0.61 | 0.46 | 5.84 |
| Few Shot label pred | **0.73** | 0.28 | 0.19 | **0.58** | **5.81** |

# LoRA on LLM

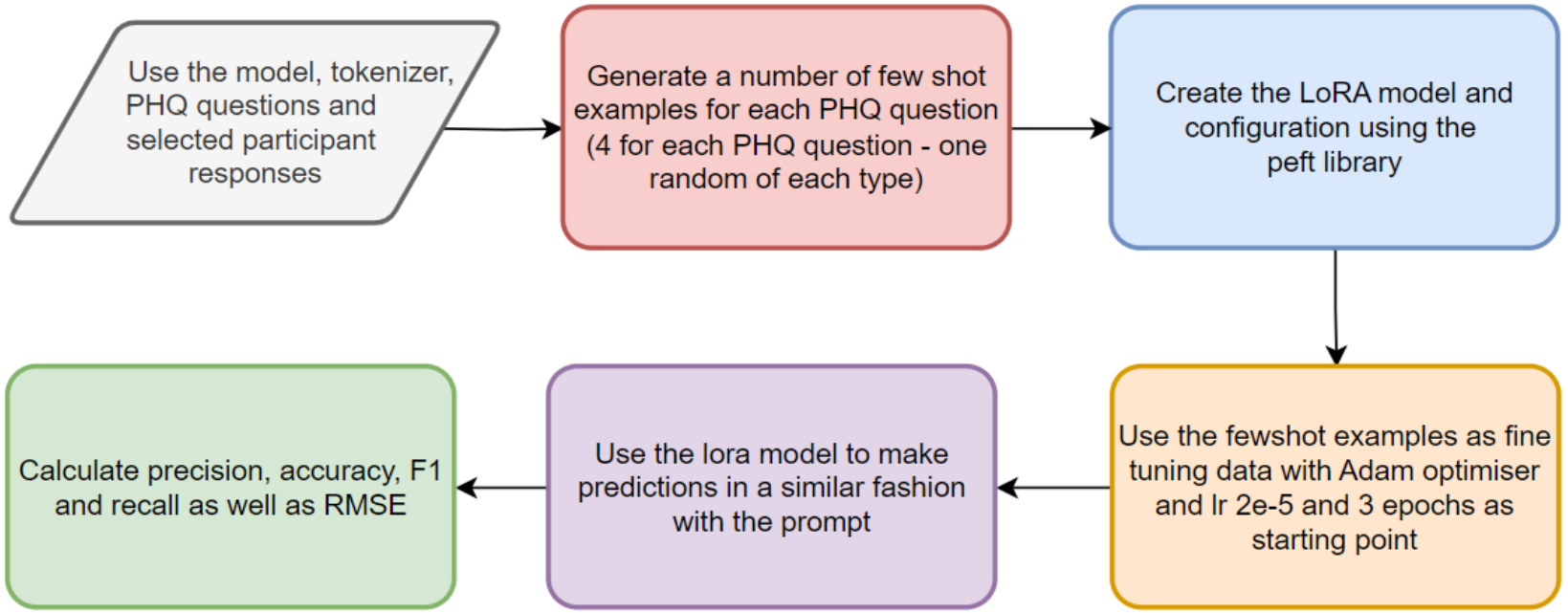



Fig 3: Low Rank Adaptation on the LLM model

**Model:** Intel's neural chat 7b version
**LoRA Configuration:** r=4, alpha=16 and dropout=0.01

# Data Augmentation: Modifications

Table 4: Results with reinforcement technique on Yuxin's baseline

| | Acc | F1 | Recall | Prec |
|---|---|---|---|---|
| Reinforce | 0.53 | 0.61 | 0.73 | 0.52 |
| Augment | 0.66 | 0.67 | 0.80 | 0.52 |
| Modified | 0.58 | 0.64 | 0.76 | 0.56 |

Table 5: Results with topic-based technique on Yuxin's baseline

| | Acc | F1 | Recall | Prec |
|---|---|---|---|---|
| Topic 29 | 0.65 | 0.69 | 0.79 | 0.62 |
| Augment | 0.71 | 0.70 | 0.71 | 0.70 |
| Modified | 0.68 | 0.69 | 0.70 | 0.68 |

| | Accuracy | F1 | Recall | Precision |
|---|---|---|---|---|
| Raw Transcript | 0.64 | 0.65 | 0.67 | 0.63 |

Table 6: Results with raw transcript on Yuxin's baseline

**Modifications:**

- **Reinforcement:** Train Aug: 100, Removed: 6, Overall, Train: 94 + 107 = 201
- **Topic-based:** Train Aug: 100, Removed: 2, Overall, Train: 98 + 107 = 205

# Tentative Plan

**Plan for next week**

1. Work further on LLM ideas – Improving specific PHQ based predictions and working further on the LoRA
2. Continue writing the thesis and literature review paper
3. Start working on the skeleton for the conference paper

**Relevant Links**

1. Overall project plan and timeline: Link
2. Analysis and notes from relevant papers: Link
3. GitHub documenting everyone's presentations and codes: Link
4. Overleaf document for the literature review: Link

# End