Assignment 2 (30)

CS F429

Deadline: 13 October 2025, 04:00 AM

Datasets

Two datasets for slot filling and intent classification

1. ATIS: https://huggingface.co/datasets/tuetschek/atis
2. SLURP: https://github.com/pswietojanski/slurp/tree/master/dataset/slurp

Problem Statement

- You are required to build and evaluate models for **intent classification and slot filling** on the 2 above datasets.
- Perform necessary preprocessing of the datasets and implement the solution with RNN and LSTM architectures and compare them
- Perform the following experiments with both architectures
    1. **Independent Slot Filling and Intent Recognition**

       The model predicts slot labels and intent information independently of each other.

    2. **Slot → Intent**

       Perform slot filling first. Use these slot predictions as additional features for intent classification.

    3. **Intent → Slot**

       Perform intent recognition first. Use the intent predictions as an additional feature for slot filling.

    4. **Joint Model with Shared Encoder (Multi-Task Learning)**

       Implement a shared encoder (RNN/LSTM) with two output heads: one for slot filling, one for intent classification. The joint training objective combines sequence labelling loss and classification loss.

    Evaluation and Analysis: Check precision, recall, F1 score, and accuracy. Compare the performance across the five approaches.

Follow the same protocol for submission:

- Zip file with code
- Report with all details