Aim- Implement Named Entity Recognizer for the given text input

Objective:

To study and write program for named entity recognition

Theory:

Named entity recognition is a natural language processing technique that can automatically scan entire articles and pull out some fundamental entities in a text and classify them into predefined categories. Entities may be,

1. Organization
2. Quantities
3. Monetary values
4. Percentages and more
5. Peoples names
6. Company names
7. Geographical locations
8. Product names
9. Dates and times
10. Amounts of money
11. Names of events

In simple words, Named Entity Recognition is the process of detecting the named entities such as person names, location names, company names etc. from the text. It is also known as entity identification or entity extraction or entity chunking.

Program:

```
import spacy

import pandas as pd

nlp = spacy.load('en_core_web_sm')

doc = nlp(u"Tesla Inc. Chief Executive Officer Elon Musk said he's considering taking the electric-car maker private, a surprise move that would end the company's eight-year history as a publicly traded firm.")

for ent in doc.ents:

    print(ent.text, "-", ent.label_, "-", spacy.explain(ent.label_))
```

Output:

Tesla Inc. - ORG - Companies, agencies, institutions, etc.

Elon Musk - PERSON - People, including fictional

eight-year - DATE - Absolute or relative dates or periods

Conclusion: Named Entity Recognition (NER) is pivotal in real-world scenarios for several reasons. It plays a critical role in information extraction, helping identify and categorize entities like names of people, organizations, locations, and dates in text data. This capability is indispensable in applications like news summarization, content recommendation, and search engines, where precise entity recognition enhances the quality of results. Additionally, in fields like finance and healthcare, NER aids in extracting essential information from unstructured documents, improving decision-making processes and compliance efforts. Moreover, NER supports sentiment analysis by identifying entities associated with sentiment-bearing opinions, thus refining the sentiment analysis results. In essence, NER is a foundational component in harnessing valuable insights from vast volumes of textual data across diverse industries.