NLP Assignment 3

1. **What's the difference between regular grammar and regular expressions?**
    Regular Grammar:
    Describes the rules for constructing strings in a language using a set of production rules. It typically consists of terminals, non-terminals, production rules, and a start symbol. It defines the language's syntax through a set of production rules like A → aB.

    Regular Expressions:
    Provide a concise way to represent patterns in strings. They are sequences of characters defining a search pattern. Regular expressions are more about pattern matching and are widely used in tasks like string matching and text processing.

2. **In the context of NLP, what is parsing?**
    Parsing in NLP refers to the process of analyzing the grammatical structure of a sentence to determine its syntactic constituents. It involves breaking down sentences into their grammatical components such as nouns, verbs, adjectives, etc., and determining the relationships between these components.

3. **What exactly is the TF-IDF procedure?**
    TF-IDF is a numerical statistic used to evaluate the importance of a word in a document relative to a collection of documents (corpus). It calculates a weight for each word based on its frequency in the document and rarity across documents, aiming to highlight words that are significant for a particular document.

4. **Which factors influence Natural Language Processing interpretation?**
    Context, ambiguity, syntax, semantics, co-reference resolution, word sense disambiguation, and domain-specific knowledge are some of the factors influencing NLP interpretation. Understanding the context and disambiguating word meanings are critical challenges in accurate interpretation.

5. **What are the different types of conversational interfaces?**
   Conversational interfaces include Chatbots (text-based), Voice Assistants (voice-based), and Multimodal Interfaces (combination of text, voice, and visual elements). Chatbots and voice assistants are widely used for communication and interaction in various applications.

6. **Apply Uni-gram and Bi-grammar-gram to the statement "I am really happy."**
   Uni-gram:
   Uni-grams are single words in a sentence. For the statement "I am really happy," the uni-grams are: ["I", "am", "really", "happy"].

   Bi-gram:
   Bi-grams are pairs of adjacent words in a sentence. For the statement "I am really happy," the bi-grams are: ["I am", "am really", "really happy"].