**Sentiment Analysis with Pre-trained Word Embeddings Documentation**

**1. Word Embeddings Setup**

For this task, the Gensim library was chosen, and the Word2Vec pre-trained word embeddings model was utilized.

**2. Sentiment Analysis Data**

A small sentiment analysis dataset was created, consisting of movie reviews labeled as positive or negative.

**3. Load Pre-trained Word Embeddings**

The Word2Vec pre-trained word embeddings model was loaded using Gensim.

**4. Data Preprocessing**

The sentiment analysis dataset was tokenized and prepared for input to the word embeddings model. This involved using the `Tokenizer` and `pad\_sequences` from Keras.

**5. Word Embeddings Conversion**

The tokenized words in the dataset were converted into their corresponding word vectors using the Word2Vec pre-trained embeddings.

**6. Simple Neural Network**

A simple neural network for sentiment analysis was created using Keras. The embedding layer was initialized with the pre-trained word embeddings.

**7. Transfer Learning Application**

The embedding layer of the neural network was initialized with pre-trained word embeddings, and this layer was fixed during training.

**8. Training and Evaluation**

The neural network was trained on the sentiment analysis dataset, and the model's accuracy was evaluated on a separate test dataset.

**9. Comparison with Random Initialization**

The experiment was repeated with random initialization for the embedding layer. The model was trained and evaluated again.

**10. Observation and Conclusion**

The performance of the two models – one with pre-trained embeddings and one with random initialization – was compared. The accuracy scores were analyzed to draw conclusions about the effectiveness of transfer learning in sentiment analysis.

