**Lee\_Report\_PA1**

**Cryptography Section W01 Summer Semester 2024 CO**

**Raehyeong Lee**

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**Overview**

The objective of this project is to implement a text conversion program that transforms data between various formats: strings, lists of characters, ASCII codes, and binary representations. The program is composed of three main functions, each responsible for converting between two of these formats. This multi-step conversion allows for a comprehensive understanding of data representation at different levels.

**Program Explanation**

The program is implemented in Python, with each function handling a specific type of conversion. Here's a detailed explanation of the code:

**Function Descriptions**

**Function 1: String List Converter**

This function converts a string to a list of characters or a list of characters back to a string, based on the specified input type. 텍스트, 스크린샷, 폰트이(가) 표시된 사진

자동 생성된 설명

* **Inputs**:
  + input data: The data to be converted, either a string or a list of characters.
  + input type: A string indicating the type of input, either 'string' or 'list'.
* **Outputs**:
  + If input type is 'string', the function returns a list of characters.
  + If input type is 'list', the function returns a string formed by concatenating the characters in the list.
* **Test**:
  + Input string: "hello world"
  + Output list:
  + Input list: ['h', 'e', 'l', 'l', 'o', ' ', 'w', 'o', 'r', 'l', 'd']
  + Output String:

**Function 2: List of Ascii Converter**

This function converts a list of characters to a list of corresponding ASCII codes, or a list of ASCII codes back to a list of characters. 텍스트, 스크린샷, 폰트이(가) 표시된 사진

자동 생성된 설명

* **Inputs**:
  + input data: The data to be converted, either a list of characters or a list of ASCII codes.
  + input type: A string indicating the type of input, either 'list' or 'ascii'.
* **Outputs**:
  + If input type is 'list', the function returns a list of ASCII codes.
  + If input type is 'ascii', the function returns a list of characters.
* **Test**:
  + Input list: ['h', 'e', 'l', 'l', 'o', ' ', 'w', 'o', 'r', 'l', 'd']
  + Output list: 
  + Input list: [104, 101, 108, 108, 111, 32, 119, 111, 114, 108, 100]
  + Output list: 

**Function 3: ascii binary converter**

This function converts a list of ASCII codes to a list of binary numbers, or a list of binary numbers back to a list of ASCII codes. 텍스트, 스크린샷, 폰트이(가) 표시된 사진

자동 생성된 설명

* **Inputs**:
  + input data: The data to be converted, either a list of ASCII codes or a list of binary numbers.
  + input type: A string indicating the type of input, either 'ascii' or 'binary'.
* **Outputs**:
  + If input type is 'ascii', the function returns a list of binary numbers.
  + If input type is 'binary', the function returns a list of ASCII codes.
* **Test**:
  + Input list: [104, 101, 108, 108, 111, 32, 119, 111, 114, 108, 100]
  + Output list:
  + Input list: [1101000, 1100101, 1101100, 1101100, 1101111, 100000, 1110111, 1101111, 1110010, 1101100, 1100100]
  + Output list: 

**Testing the Text Converter**

A comprehensive test function, test text converter, was developed to verify the accuracy and functionality of the text converter. This function performs a series of conversions starting from an input string and ending back at the original string, ensuring that each conversion step is correctly implemented. The special thing is that the proigram requests user the input string and the conversion is sequentially performed accordingly.

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**Test Function: test text converter**

This function demonstrates the conversion process through a sequence of transformations and prints the results at each step.

* **Steps**:
  1. Convert the input string to a list of characters. Use of function 1.
  2. Convert the list of characters to a list of ASCII codes. Use of function 2.
  3. Convert the list of ASCII codes to a list of binary numbers. Use of function 3.
  4. Convert the list of binary numbers back to a list of ASCII codes. Use of function 3.
  5. Convert the list of ASCII codes back to a list of characters. Use of function 2.
  6. Convert the list of characters back to the original string. Use of function 1.

**Conclusion**

The text converter successfully converts text through multiple representations, including strings, lists of characters, ASCII values, and binary numbers. The provided test function demonstrates the accuracy and reliability of each conversion step, confirming that the original string can be accurately reconstructed after a series of transformations. This program is a robust tool for text manipulation and conversion, useful in various applications requiring such transformations.

**Project Code**

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**Output**

**텍스트, 스크린샷, 폰트이(가) 표시된 사진

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