MORSE CODE TRANSLATOR

Team Project
Course Code - INT213

Subrat Keshari Sahu &
Huda Saif Mansoor

Name1 – Subrat Keshari Sahu
Reg. No. – 12020245
Roll no. – RK20YRB85

Name2 – Huda Saif Mansoor
Reg. no. – 12019037
Roll no. – RK20YRB70

INTRODUCTION:

Morse Code is a method of transmitting text information as a series of on-off tones, lights, or clicks that can be directly understood by a skilled listener or observer without special equipment. It is named for Samuel F. B. Morse, an inventor of the telegraph. It is used by Military forces and some special organization for transfer the important message without knowing anyone.

ALGORITHM:

The algorithm is very simple. Every character in the English language is substituted by a series of 'dots' and 'dashes' or sometimes just the single 'dot' or 'dash' and vice versa.

There are two phases in this program. They are,

1. Encryption:

- *In the case of encryption, we extract each character (if not space) from a word one at a time and match it with its corresponding morse code stored in whichever data structure we have chosen.*

- *Store the morse code in a variable that will contain our encoded string and then we add a space to our string that will contain the result.*

- *While encoding in morse code we need to add 1 space between every character and 2 consecutive spaces between every word.*

- *If the character is a space, then add another space to the variable containing the result. We repeat this process till we traverse the whole string.*

2. Decryption:

- *In the case of decryption, we start by adding a space at the end of the string to be decoded.*

- *Now we keep extracting characters from the string till we are not getting any space.*

- *As soon as we get a space, we look up the corresponding English language character to the extracted sequence of characters (or our morse code) and add it to a variable that will store the result.*

- *Remember keeping track of the space is the most important part of this decryption process. As soon as we get 2 consecutive spaces, we will add another space to our variable containing the decoded string.*

- *The last space at the end of the string will help us identify the last sequence of morse code characters (since space acts as a check for extracting characters and start decoding them).*

Implementation:

Python provides a data structure called dictionary which stores information in the form of key-value pairs which is very convenient for implementing a cipher such as a morse code. We can save the morse code chart in a dictionary where (key-value pairs) => (English Characters-Morse Code). The plaintext (English characters) takes the place of keys and the ciphertext (Morse code) forms the values of the corresponding keys. The values of keys can be accessed from the dictionary in the same way we access the values of an array through their index and vice versa.

Code:

```python
MORSE_CODE_DICT = { 'A':'.-', 'B':'-...',
                    'C':'-.-.', 'D':'-..', 'E':'.',
                    'F':'..-.', 'G':'--.', 'H':'....',
                    'I':'..', 'J':'.---', 'K':'-.-',
                    'L':'.-..', 'M':'--', 'N':'-.',
                    'O':'---', 'P':'.--.', 'Q':'--.-',
                    'R':'.-.', 'S':'...', 'T':'-',
                    'U':'..-', 'V':'...-', 'W':'.--',
                    'X':'-..-', 'Y':'-.--', 'Z':'--..',
                    '1':'.----', '2':'..---', '3':'...--',
                    '4':'....-', '5':'.....', '6':'-....',
                    '7':'--...', '8':'---..', '9':'----.',
                    '0':'-----', ', ':'--..--', '.':'.-.-.-',
                    '?':'..--..', '/':'-..-.', '-':'-....-',
                    '(':'-.--.', ')':'-.--.-'}

def encrypt(message):
    cipher = ''
    for letter in message:
        if letter != ' ':

            cipher += MORSE_CODE_DICT[letter] + ' '
        else:
            cipher += ' '

    return cipher

def decrypt(message):

    message += ' '

    decipher = ''
    citext = ''
    for letter in message:

        if (letter != ' '):

            i = 0

            citext += letter

        else:

            i += 1
```

```python
        if i == 2 :

            decipher += ' '
        else:

            decipher += list(MORSE_CODE_DICT.keys())[list(MORSE_CODE_DICT
            .values()).index(citext)]
            citext = ''

    return decipher

def main():
    message = input("Enter your message in letter: ")
    result = encrypt(message.upper())
    print (result)

    message = input("Enter your message in Morse code: ")
    result = decrypt(message)
    print (result)

if __name__ == '__main__':
    main()
```

Output:

Enter your message in letter: Subrat Keshari Sahu
... ..- -... .-. .- - -.- . ...- .-. .. ... .- .... ..-
Enter your message in Morse code: .... ..- -.. .- ... .- .. ..-. -- .- -. ... --- --- .-.
HUDA SAIF MANSOOR

Thank You.