104. Word Wrap Problem

PROGRAM:-

```
def print_solution(p, n):
    k = 0
    if p[n] == 1:
        k = 1
    else:
        k = print_solution(p, p[n] - 1) + 1
    print('Line number', k, ': from word no.', p[n], 'to', n)
    return k

def solve_word_wrap(words, max_width):
    n = len(words)
    extras = [[0] * (n + 1) for _ in range(n + 1)]
    lc = [[0] * (n + 1) for _ in range(n + 1)]
    c = [0] * (n + 1)
    p = [0] * (n + 1)

    for i in range(1, n + 1):
        extras[i][i] = max_width - len(words[i - 1])
        for j in range(i + 1, n + 1):
            extras[i][j] = extras[i][j - 1] - len(words[j - 1]) - 1

    for i in range(1, n + 1):
        for j in range(i, n + 1):
            if extras[i][j] < 0:
                lc[i][j] = float('inf')
            elif j == n and extras[i][j] >= 0:
                lc[i][j] = 0
            else:
                lc[i][j] = extras[i][j] ** 2

    c[0] = 0
    for j in range(1, n + 1):
        c[j] = float('inf')
        for i in range(1, j + 1):
            if c[i - 1] != float('inf') and lc[i][j] != float('inf') and (c[i - 1] + lc[i][j] < c[j]):
                c[j] = c[i - 1] + lc[i][j]
                p[j] = i

    print_solution(p, n)

# Example usage:
words = ["This", "is", "an", "example", "of", "text", "justification."]
max_width = 16
solve_word_wrap(words, max_width)
```

OUTPUT:-

```
Line number 1 : from word no. 1 to 3
Line number 2 : from word no. 4 to 6
Line number 3 : from word no. 7 to 7

=== Code Execution Successful ===
```

TIME COMPLEXITY:-O($n^2$)