Exersice 106:- word wrap problem

Program:-

```python
def printSolution(p, n):
    k = 0
    if p[n] == 1:
        k = 1
    else:
        k = printSolution(p, p[n] - 1) + 1
    print('Line number', k, ': From word no.', p[n], 'to', n)
    return k
def solveWordWrap(words, max_width):
    n = len(words)
    extras = [[0 for _ in range(n + 1)] for _ in range(n + 1)]
    lc = [[0 for _ in range(n + 1)] for _ in range(n + 1)]
    c = [0 for _ in range(n + 1)]
    p = [0 for _ in range(n + 1)]
    for i in range(n):
        extras[i][i] = max_width - len(words[i])
        for j in range(i + 1, n):
            extras[i][j] = extras[i][j - 1] - len(words[j]) - 1
    for i in range(n):
        for j in range(i, n):
            if extras[i][j] < 0:
                lc[i][j] = float('inf')
            elif j == n - 1 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')
```

```python
        for i in range(1, j + 1):

            if c[i - 1] != float('inf') and lc[i - 1][j - 1] != float('inf') and (c[i - 1] + lc[i - 1][j - 1] < c[j]):

                c[j] = c[i - 1] + lc[i - 1][j - 1]

                p[j] = i

    printSolution(p, n)

    return c[n]

words = ["Tushar", "Roy", "likes", "to", "code"]

max_width = 10

print("Minimum cost is", solveWordWrap(words, max_width))
```

output:-

```
Line number 1 : From word no. 1 to 2
Line number 2 : From word no. 3 to 4
Line number 3 : From word no. 5 to 5
Minimum cost is 4
```

Time complexity:-O(n^2)