Exercise171:-

11. Design a special dictionary that searches the words in it by a prefix and a suffix. Implement the WordFilter class: WordFilter(string[] words) Initializes the object with the words in the dictionary.f(string pref, string suff) Returns the index of the word in the dictionary, which has the prefix pref and the suffix suff. If there is more than one valid index, return the largest of them. If there is no such word in the dictionary, return -1.

Program:-

```
class WordFilter:
    def __init__(self, words: [str]):
        self.prefix_map = {}
        self.suffix_map = {}
        self.words = words
        for index, word in enumerate(words):
            for i in range(1, len(word) + 1):
                prefix = word[:i]
                if prefix not in self.prefix_map:
                    self.prefix_map[prefix] = []
                self.prefix_map[prefix].append(index)
            for j in range(len(word)):
                suffix = word[j:]
                if suffix not in self.suffix_map:
                    self.suffix_map[suffix] = []
                self.suffix_map[suffix].append(index)
    def f(self, pref: str, suff: str) -> int:
        if pref not in self.prefix_map or suff not in self.suffix_map:
            return -1
        prefix_indices = self.prefix_map[pref]
        suffix_indices = self.suffix_map[suff]
        i, j = len(prefix_indices) - 1, len(suffix_indices) - 1
        while i >= 0 and j >= 0:
            if prefix_indices[i] == suffix_indices[j]:
                return prefix_indices[i]
            elif prefix_indices[i] > suffix_indices[j]:
                i -= 1
            else:
                j -= 1
        return -1
words = ["apple", "banana", "cherry", "date"]
word_filter = WordFilter(words)
print(word_filter.f("a", "e"))
print(word_filter.f("b", "a"))
print(word_filter.f("c", "y"))
print(word_filter.f("d", "e"))
```

Output:-

```
C:\Users\afree\PycharmProjects\pythonProject\.venv\Scripts\python.exe C:\Users\afree\PycharmProjects\pythonProject\0.py
0
1
2
3

Process finished with exit code 0
```

Time complexity:-$O(N*L^2)$