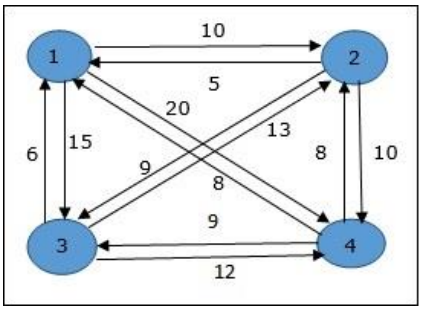
Lab Exercise 15/03/2021

1. In the traveling salesman Problem, a salesman must visit n cities. We can say that salesman wishes to make a tour or Hamiltonian cycle, visiting each city exactly once and finishing at the city he starts from. There is a non-negative cost c (i, j) to travel from the city i to city j. The goal is to find a tour of minimum cost. We assume that every two cities are connected. We can model the cities as a complete graph of n vertices, where each vertex represents a city.

Write a Program to implement Travelling Salesman Problem for the following example.



2. Write a program to implement Yet Another String Matching Problem
Suppose you have two strings s and t, and their length is equal. You may perform the following operation any number of times: choose two different characters c1 and c2, and replace every occurrence of c1 in both strings with c2. Let's denote the distance between strings s and t as the minimum number of operations required to make these strings equal. For example, if s is abcd and t is ddcb, the distance between them is 2 — we may replace every occurrence of a with b, so s becomes bbcd, and then we may replace every occurrence of b with d, so both strings become ddcd. You are given two strings S and T. For every substring of S consisting of |T| characters you have to determine the distance between this substring and T.

Input
The first line contains the string S, and the second — the string T ($1 \le |T| \le |S| \le 125000$). Both strings consist of lowercase Latin letters from a to f.

Output
Print $|S| - |T| + 1$ integers. The i-th of these integers must be equal to the distance between the substring of S beginning at i-th index with length |T| and the string T.

Example
Input
abcdefa
ddcb

Output
2 3 3 3