**Department of Mathematics and Computer Science**

2301265 Data Structures Algorithm Designs and Analysis Lab #4

Name _____ Student ID _____

**Greedy approach**

Given an array of size *n* that contain either **G**rab car or **P**assenger. Each Grab car can pick up only one passenger. And each Grab car cannot pick up a passenger who is more than k units away from Grab car.

1. Write a program using brute-force approach to find number of all solutions that give the maximum number of Passenger(s) that can ride Grab(s).
2. Write a program using greedy approach to find a solution that gives the maximum number of Passengers(s) that can ride Grab(s).

For example, if an array consists of GPPGP and we set k = 1, then the maximum number of Passengers that can ride Grabs would be 2. The first Grab picks up the first Passenger and the second Grab picks up either the second or third Passenger.

The **input** consists of two lines. The first line is a string containing the characters **G** and **P**, and the second line specifies the value of k.
The **output** depends on the method used. For the brute-force approach, output two lines: the first line contains the number of solution(s) found, and the second line contains the maximum number of passenger(s) that can ride grab(s). For the greedy approach, output a single line: the maximum number of passenger(s) that can ride grab(s).

Examples:

| Input | Output (brute-force) | Output (greedy) |
|---|---|---|
| GPPGP<br>1 | 2<br>2 | 2 |

| Input | Output (brute-force) | Output (greedy) |
|---|---|---|
| PPGGPG<br>2 | 1<br>3 | 3 |

| Input | Output (brute-force) | Output (greedy) |
|---|---|---|
| GPGPPG<br>3 | 3<br>3 | 3 |