

Leanon Systems
Recruitment Process
Technical test: Logics and Programing

Part 1 – Mathematics and Logic

1 - A group of friends at a party drink soda or beer. Thirteen friends drink soda, ten drink beer, and five drink soda and beer. How many friends are present at the party?

Answer:

2 - Sarah assumes her watch is 5 minutes late, but it is actually 10 minutes early. Sarah arrives for an appointment thinking she is 15 minutes late compared to the scheduled time. When did she actually arrive? On time, late or early? In case she arrived early, by how many minutes?

Answer:

3 - A pizzeria carries out a promotion with the ad "Buy one and get another one for half the price". A different promotion that offers the same discount percentage is:

- (a) "Take two, pay one"
- (b) "Take three and pay one"
- (c) "Take three, pay two"
- (d) "Take four and pay for three"
- (e) "Take five, pay four"

4 - Lorennna's phone number has 8 digits, but Sarah only remembers the first four in the correct order. Although she remembers the last four digits and knows that none of them repeats, she has forgotten their order. What's the number of attempts Sarah can make before she can get Lorennna's phone number right?

Part 2 - Programming

1 – A palindrome is a word that is symmetric: if we write it backward, the result word is the same. For example, "HANNAH" is a palindrome, but "GAGA" is not. Write a short program that determines whether a word is a palindrome.

2 – A huge phone book containing pairs of the form {phone number, person's name} was stored as a vector sorted by name in alphabetical order. Write a program that finds the phone number of a given person in this list, bearing in mind that the list is very large and that users need the search results to be as fast as possible.

3 – Consider the following database schema:

TABLE	COLUMNS
SUPPLIER	SUPPLIER_CODE, SUPPLIER_NAME, CITY
PART	CODE_PART, NAME_PART, PRICE
CAR	CODE_CAR, NAME_CAR, TYPE
SUPPLY	CODE_SUPPLIER, CODE_PIECE, CODE_CAR

Write an SQL command that is able to query the suppliers located in the city named "VITORIA" that provide the part code "MOTOR" for the car coded "KOMBI", with their respective prices.

Example:

SUPPLIER	PRICE
Supplier A	1,000
Supplier B	1,500

4 - Your friend is developing a small image processing program and has asked for your help in implementing MS-Paint's "paint bucket"-like functionality. Their program represents images using arrays of characters, with each array value representing a pixel and letters and symbols representing different colors. For example, the following 4x6 matrix represents the letter P in color "#", with background color "." (dot)

```
.###. .
.#..#.
.###. .
.#....
```

Your subroutine should take a pixel and a new color and paint the region of that pixel with the new color, like MS-Paint's "paint bucket" tool.

Examples:

Pixel (0,1) and new color 'O'			Pixel (1,3) and new color 'o'			Pixel (1,3) and new color '#'	
Before	After		Before	After		Before	After
###..	.OOO..		###.	###..		###..	###..
#..#.	.O..#.		#..#.	.#oo#.		#..#.	####.
###..	.OOO..		###.	###..		###..	###..
#....	.O....		#....	#....		#....	#....

