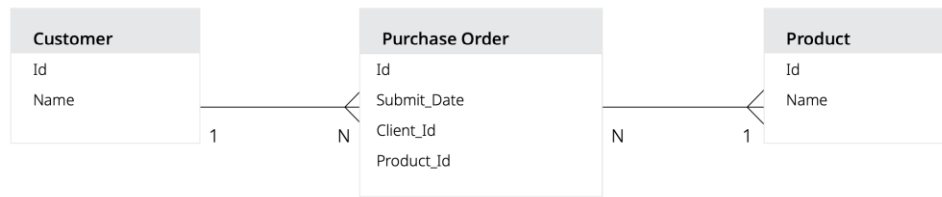


# Programming Test

## 1. SQL



Assume the following model with the following data:

Customer	
Id	Name
1	Mary
2	Noah
3	Anna
4	Elizabeth

Purchase Order				
Id	Submit_Date	Customer_Id	Product_Id	
1	2019-02-04	1	1	
2	2019-02-05	1	2	
3	2019-02-06	2	2	
4	2019-02-07	3	1	
5	2019-02-13	1	2	

Product	
Id	Name
1	Laptop
2	Web Cam
3	Keyboard

1.1 How do you obtain the list of client IDs that purchased product 2 (Web Cam) in SQL?

Expected result: ID (1,2)

1.2 How do obtain the list of client IDs that did not purchase product 2 (Web Cam) in SQL?

Expected result: ID (3,4)

1.3 How do you obtain a report with the number of purchase orders for each client ordered with the best clients first in SQL?

Expected result: Mary, 3; Noah, 1; Anna, 1;

1.4 Adapt the database model to support multiple products for each order.

## 2. Algorithmics - Part 1

Write a function to merge two strings in the reversed order.

```
InvertedMerge( "abcdefg", "12345" ) == "g5f4e3d2c1ba"
```

```
InvertedMerge( "x", "12345" ) == "x54321"
```

```
InvertedMerge( "ABCDEF", "z" ) == "FzEDCBA"
```

## 3. Algorithmics - Part 2

[University of California] The Soundex Index System was developed so that similar sounding names or names with similar spelling could be encoded for easy retrieval. It has been used by the U.S. Bureau of the Census, and some states use it to help encode driver's license numbers. Your task is to convert a sequence of names into the corresponding Soundex codes.

A Soundex code always consists of a letter followed by three digits, whereby:

1. The first letter of a name appears (unencoded) as the first character of the Soundex code and is capitalized. It is also the only letter.
2. The letters A, E I, O, U, Y, W, and H are never encoded when they are not the first character in a word. They do serve, however, to break sequences of like-coded letters (see next rule).
3. All other letters are encoded according to the following table, except when they immediately follow a letter (including the first

Code	Key Letters
1	B, P, F, V
2	C, S, K, G, J, Q, X, Z
3	D, T
4	L
5	M, N
6	R

4. letter) that would be encoded with the same code digit:
5. Codes are truncated after the third digit.
6. Trailing zeros are appended as needed so all names are encoded with a letter followed by three digits.

The input contains a sequence of words in free format and ends at end of the file. The output written to the file should consist of a column of names and a column of their corresponding Soundex codes in the format shown in the example.