**Algorithmic Complexity :**

Algorithmic Complexity is basically an approximate number of steps or operations performed by an algorithm depending on the user input data. It is the order of step count during evaluation but not the exact count. It can also be called as the Running Time.

There are different types involved in algorithm complexity.

* Linear
* Quadratic
* Cubic
* Exponential
* Constant
* Logarithmic

The  execution speed  of a program depends on the complexity of the algorithm, which is executed. If this complexity is low, the program will execute fast. If the complexity is high, the program will execute slowly.

We need to understand the algorithmic complexity because if the algorithm has any asymptotic behavior, then we can compare  algorithms and even categorize them. Complexity is about the algorithm itself. The way it processes the data to solve a given problem. Analysis of an algorithm’s complexity is helpful when comparing algorithms or seeking improvements as we are concerned more about the order.

**Example** : A pizza restaurant has several toppings to choose from :

* Pepperoni (a)
* Spinach (b)
* Mushroom (c)
* Chicken (d)

Customers may choose any combination of toppings or none for their pizza. Now consider an algorithm that finds every possible unique combination of toppings. This is an exponential algorithm with complexity 2^n.

* 0 toppings : 1 combination ( no toppings at all )
* 1 toppings : 2 combinations ( none , a )
* 2 toppings : 4 combinations ( none, a, b, a b )
* 3 toppings : 8 combinations ( none, a, b, c, a b, a c, b c, a b c )
* 4 toppings : 16 combination ( none, a, b, c, d, a b, a c, a d, b c, b d, c d, a b c, a b d, a c d, b c d, a b c d )

**FINAL PROJECT - DATA690**

I am interested in doing the project assigned i.e Papa Tony’s pizza franchise. I will be using the Google Colaboratory tool.

The classes involved in my project are PizzaOrder , Pizza , Store, Customer , Employee. They contain the following information.

Class PizzaOrder

● Ability to add/remove pizza(s)

○ An order can have more than one pizza.

●  Ability to specify the store for which the order is made , apply special promotion code , check the order status.

○ Possible statuses are ORDER\_CREATED, ORDER\_CANCELED, ORDER\_READY, ORDER\_ON\_DELIVERY, ORDER\_COMPLETE

● Has customer information

Class Pizza

● Ability to specify toppings

○ Ability to add/remove toppings

●  Ability to specify price and crust type (thin/thick)

Class Store

● Ability to hold a list of employees , add/remove employees

●  Needs to have phone number, address including zip code and be able to show monthly pizza sales.

Class Employee

● Has first name, last name

Class Customer

●  Has first name, last name, phone number, zip code, frequent mileage number

The project will be having the abilities like Sorting PizzaOrder by order date and total order amount, search PizzaOrder by customer, PizzaOrder by order date , pull a list of PizzaOrder prior to a certain date in sorted order by date, customer must be able to find one of our stores in the same zip code.