Asymptotic Notation

# Source:

1. **Asymptotic Notation**

# Khan Academy: [Asymptotic Notation](https://www.khanacademy.org/computing/computer-science/algorithms#asymptotic-notation) learn here nice theory with examples practice here quiz’s

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## **Fig: - 1.1** Common Asymptotic Notations

Source: tutorials point

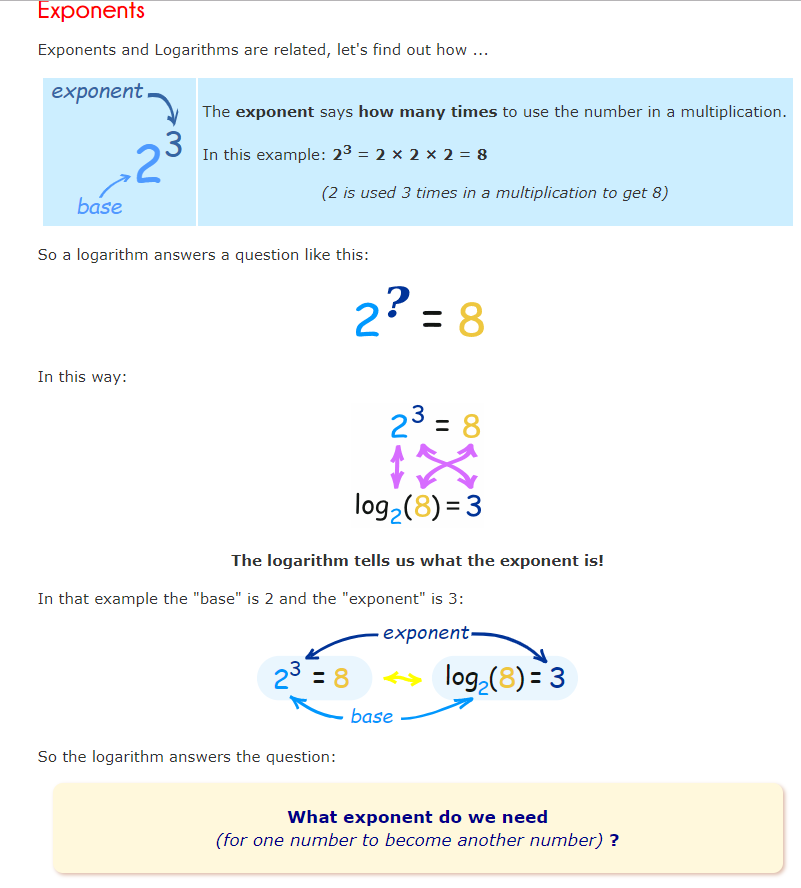
# Introduction to Logarithms:

# [logarithms](https://www.mathsisfun.com/algebra/logarithms.html) refer this very nice introduction about logs.

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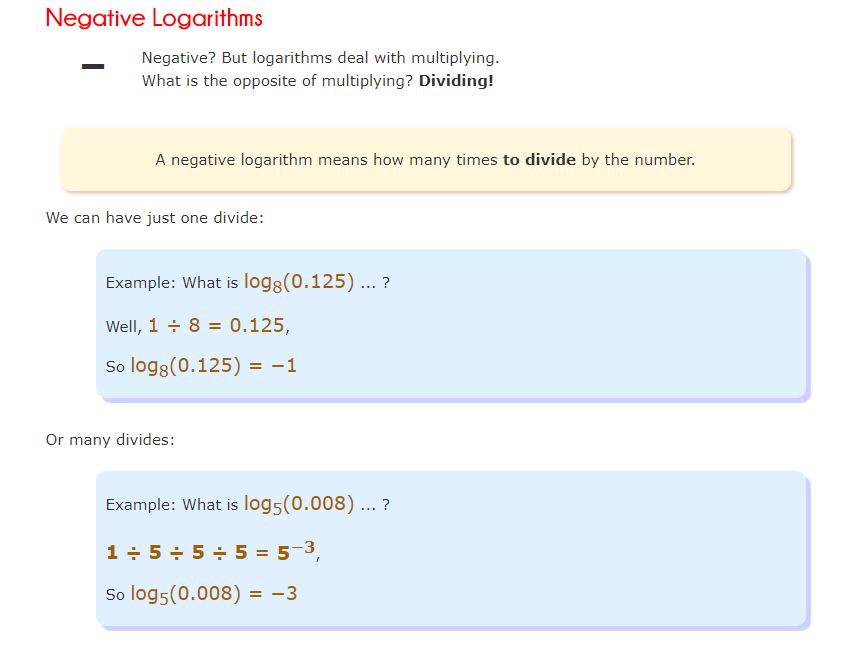
## **Fig: - 1.2** Basic Log Example

Source: maths is fun



## **Fig: - 1.3** Exponent Log Example

Source: maths is fun

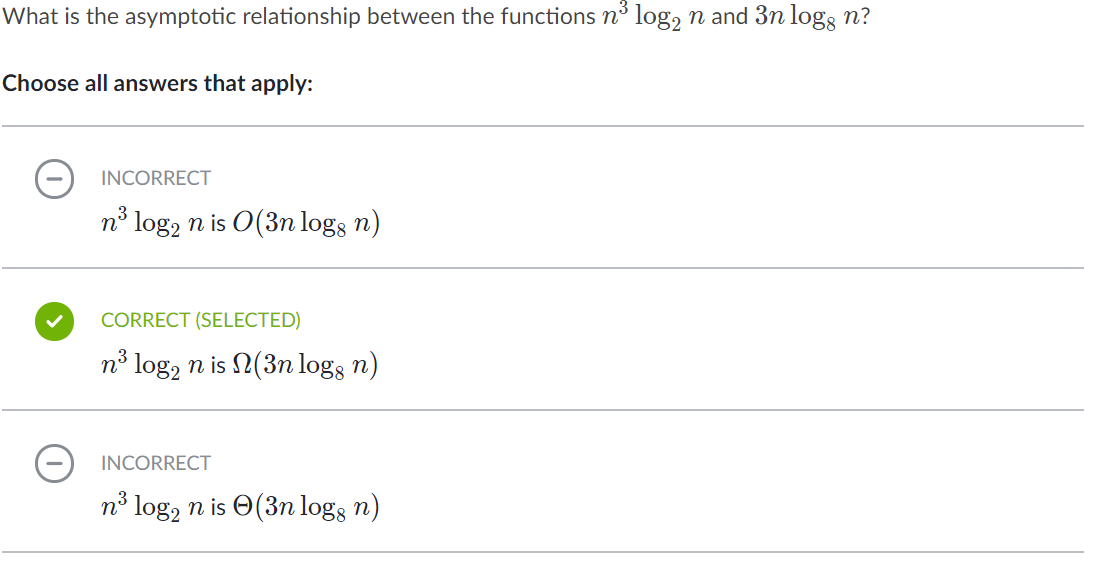


## **Fig: - 1.4** Negative Logs

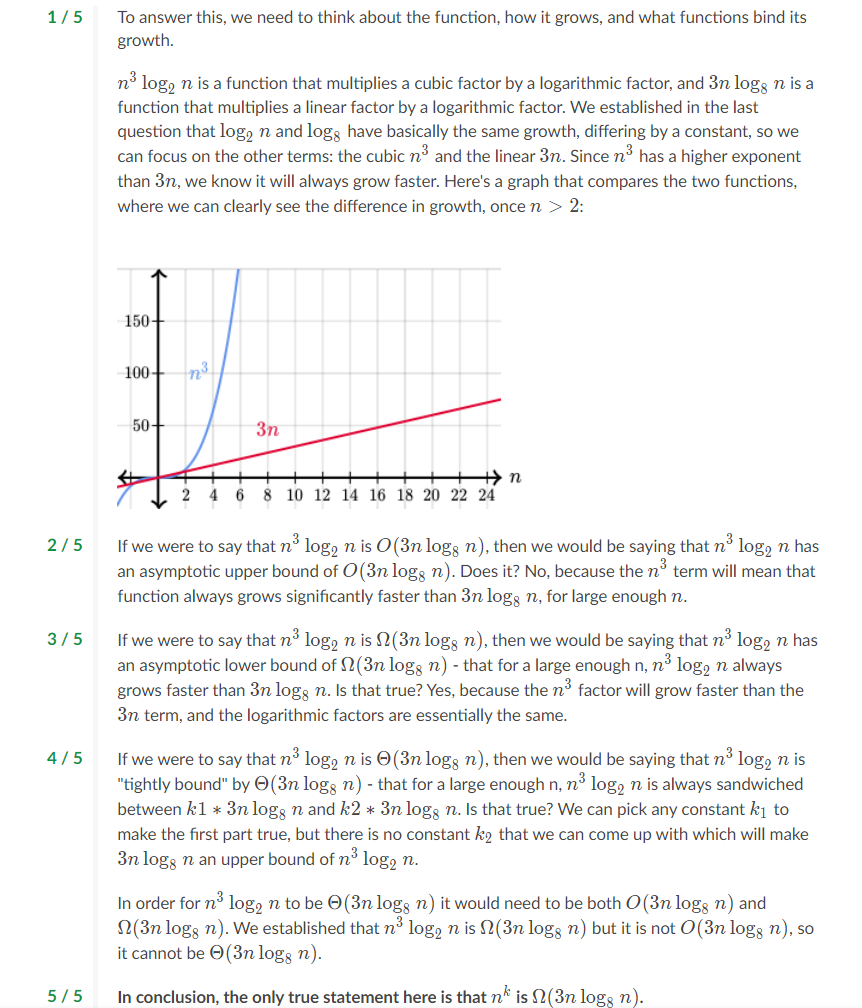
Source: maths is fun

Quiz source **Khan Academy**

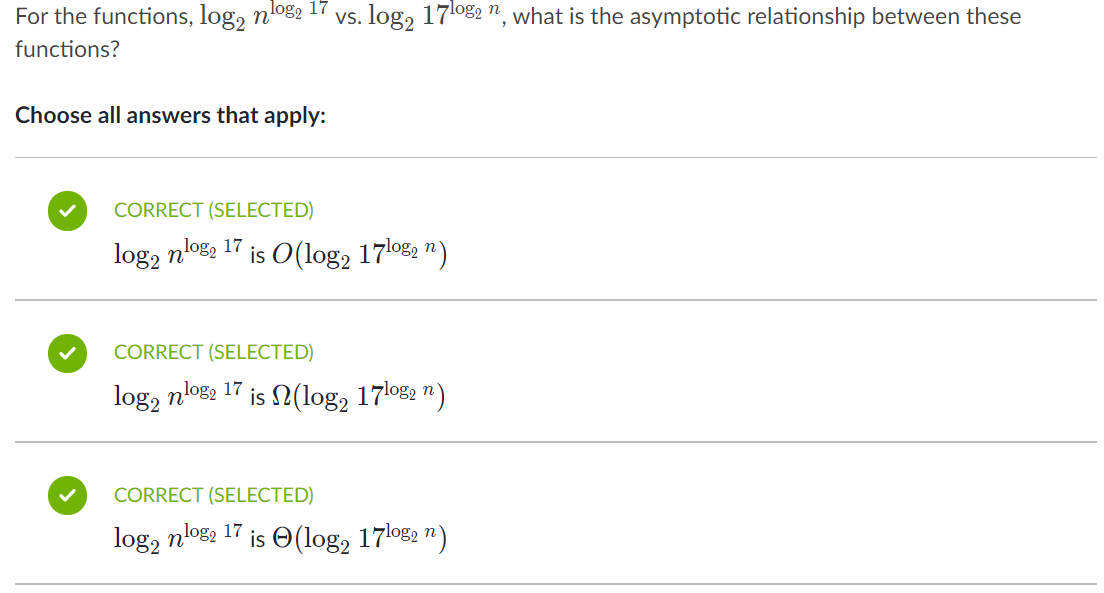
1. Question



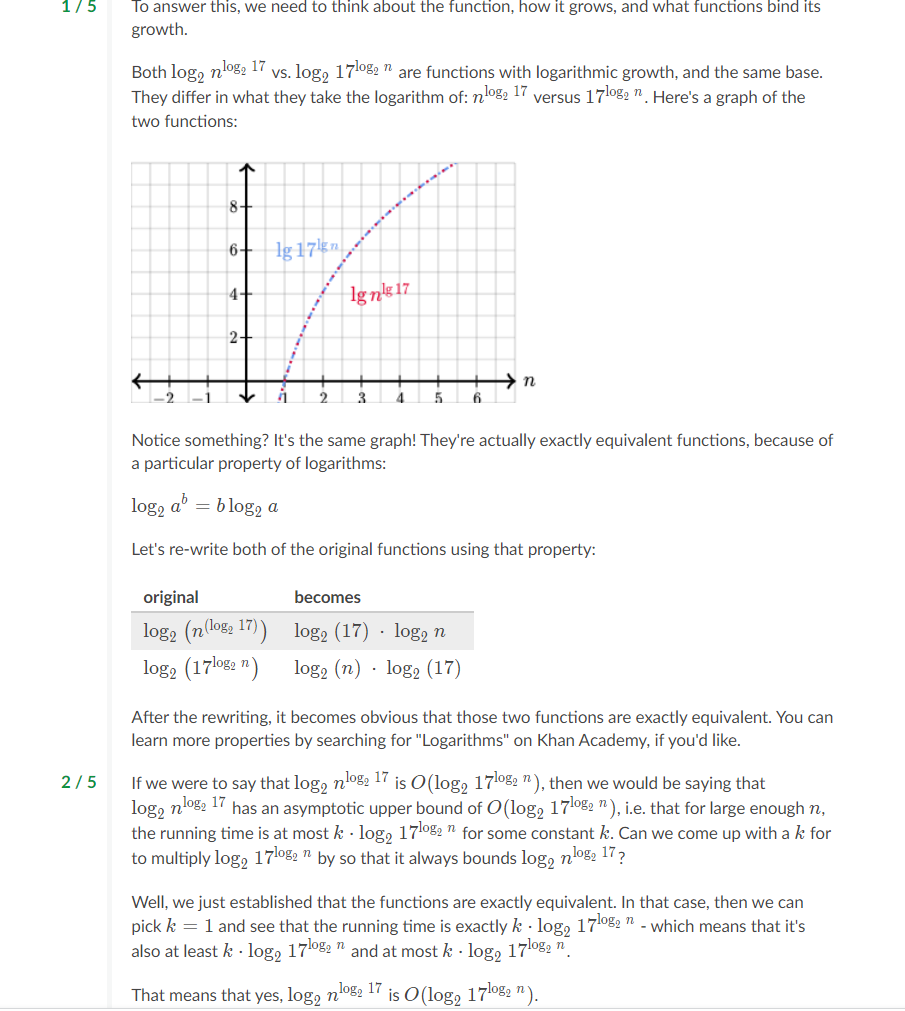
Explanation: -

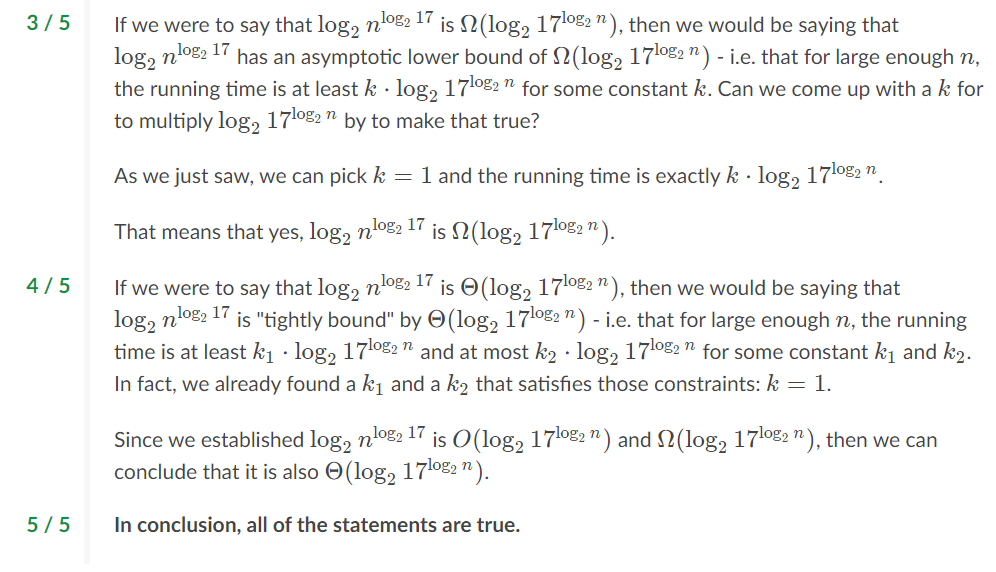


1. Question

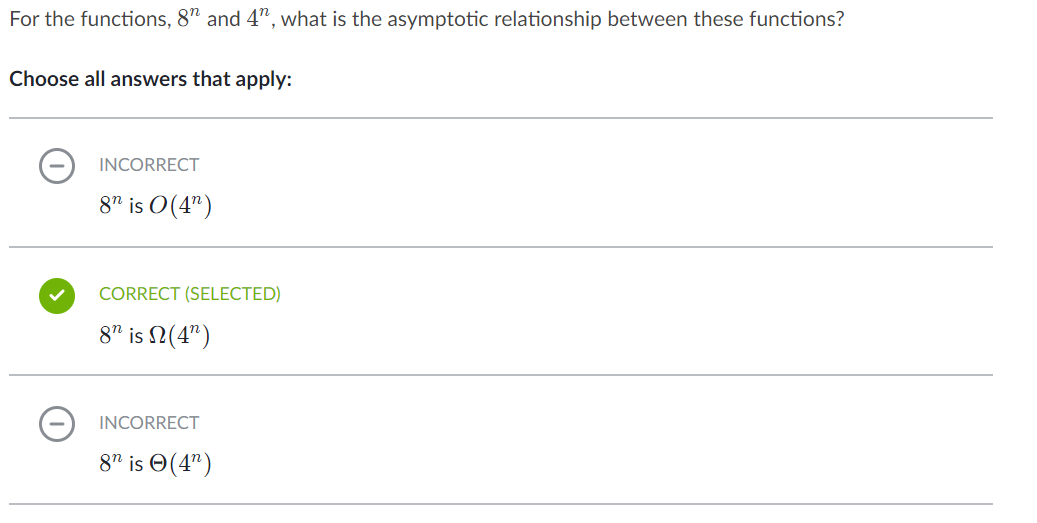


Explanation: -



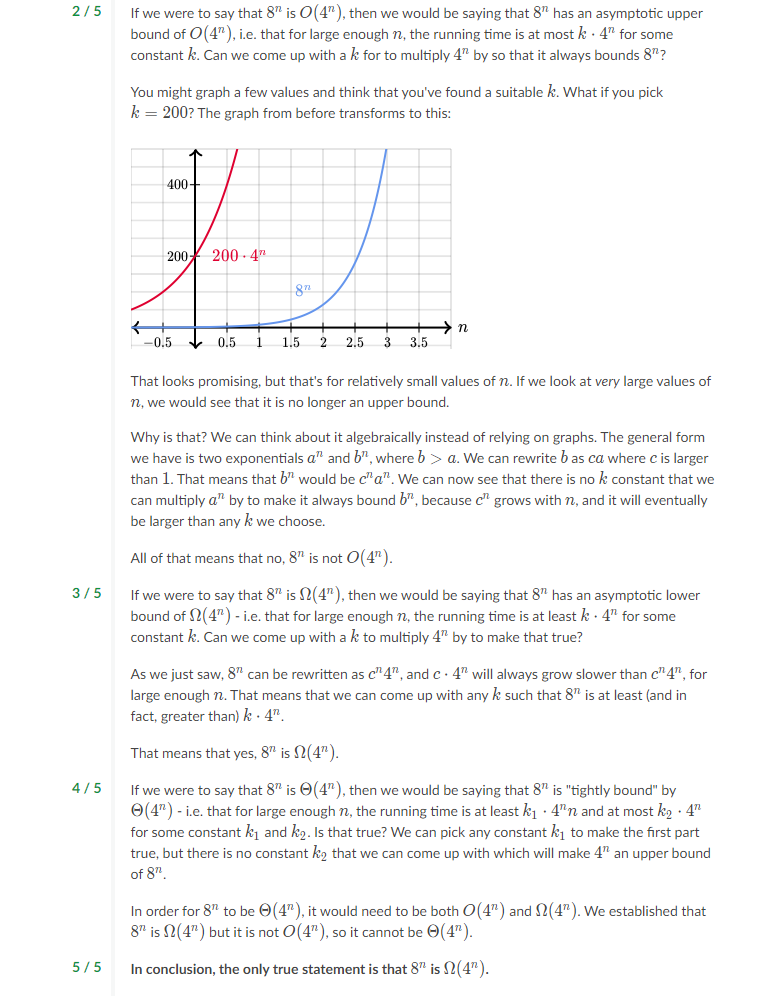


1. Question: -



Explanation: -

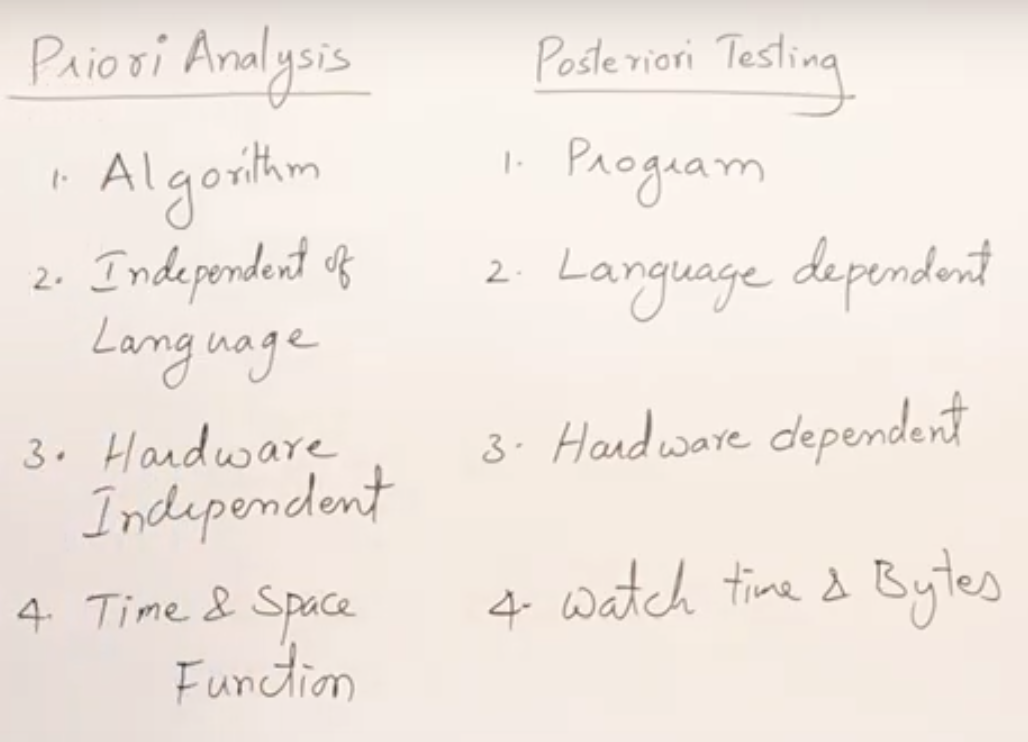




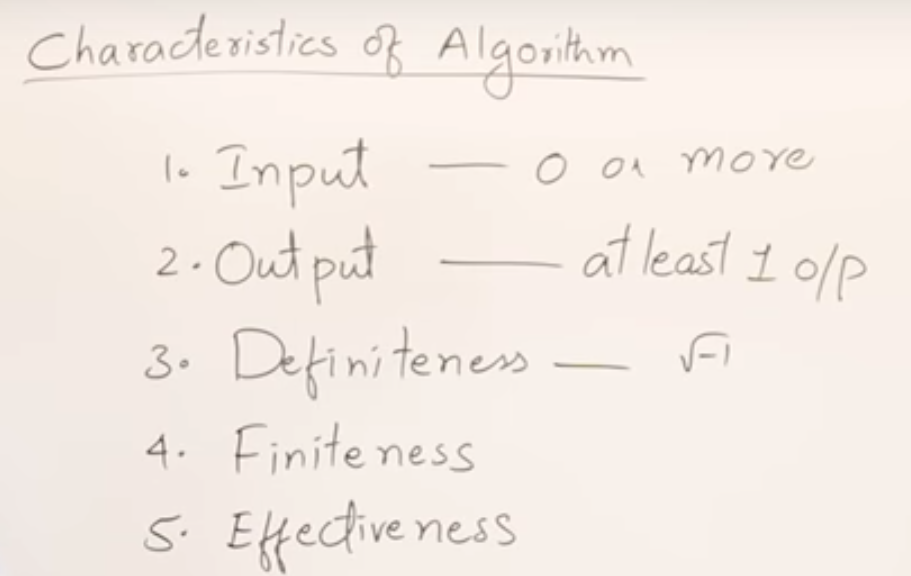
Algorithms from Abdul Bari channel.

1. Intro about course

# Priori Analysis and Posteriori Testing

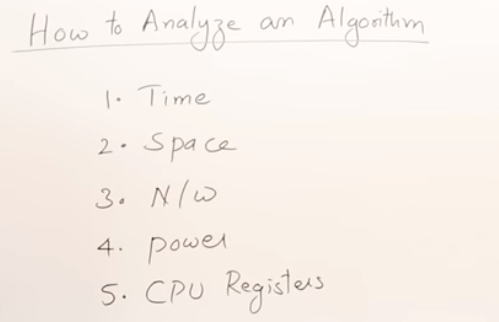


# 1.2 Characteristics of Algorithm



* 0 or more inputs it can have.
* Should have at least one output.
* It should not contain any indeterminate statements like √-1.
* Algorithm must have an end point.
* Don’t write unnecessary statements in it.

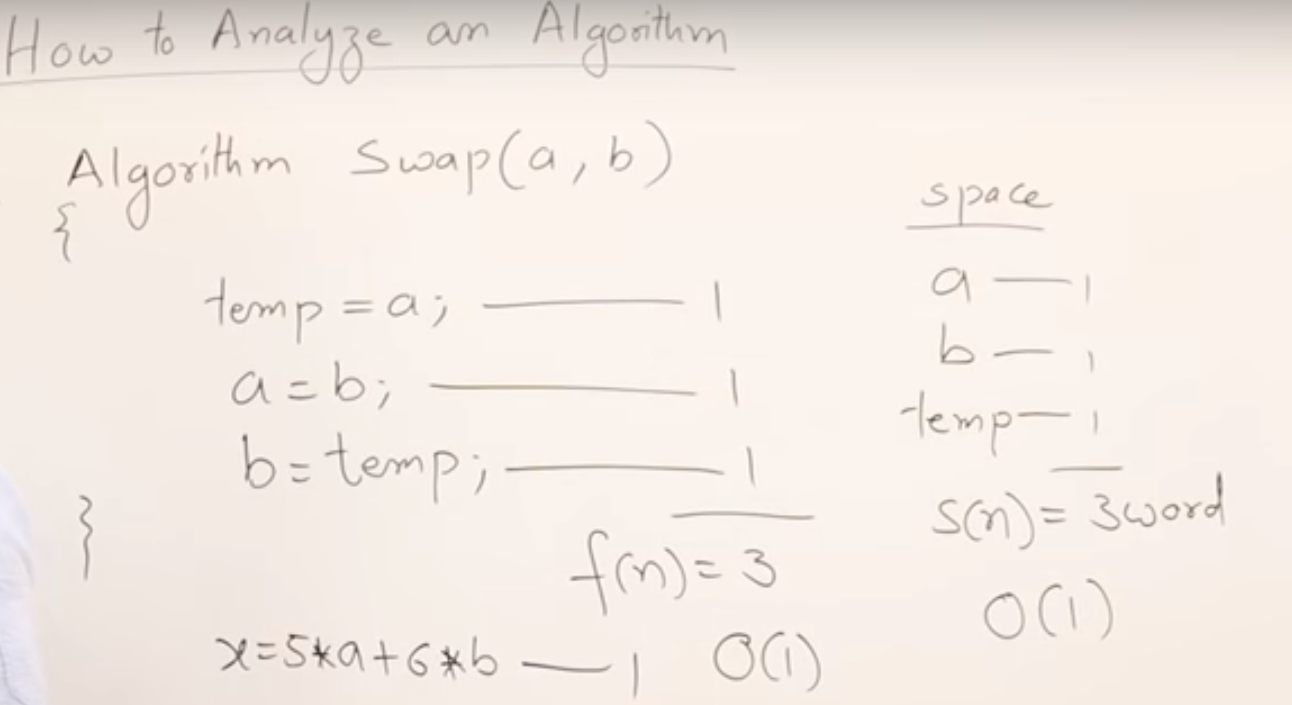
# 1.3 How Write and Analyse Algorithm



Chrematistics of algorithm.

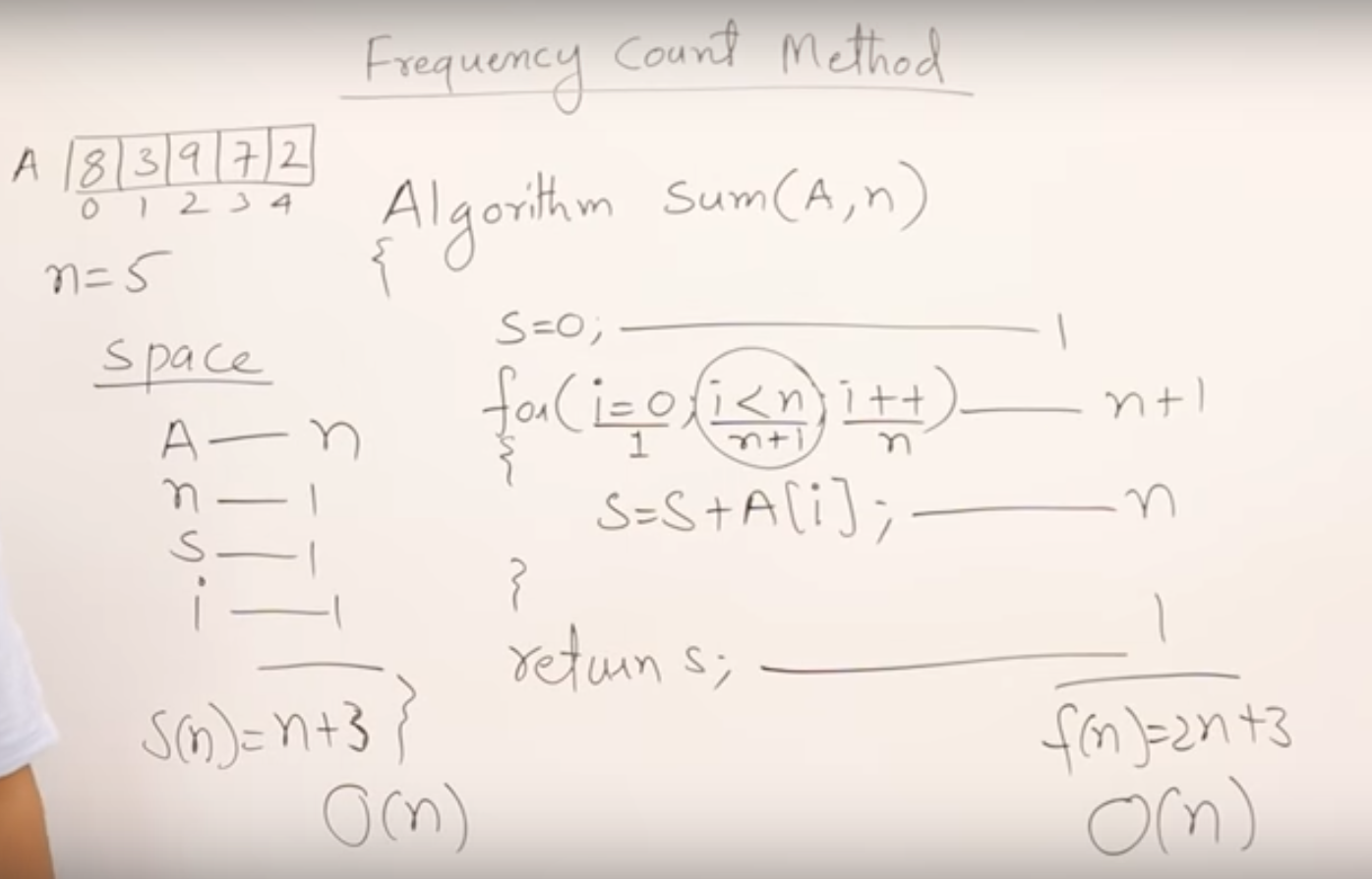
* Time and space are common.
* If it is n/w-based app how much it is utilising.
* Power basically mobile based apps.
* If it is device driver CPU reg.

Basic time and space analysis

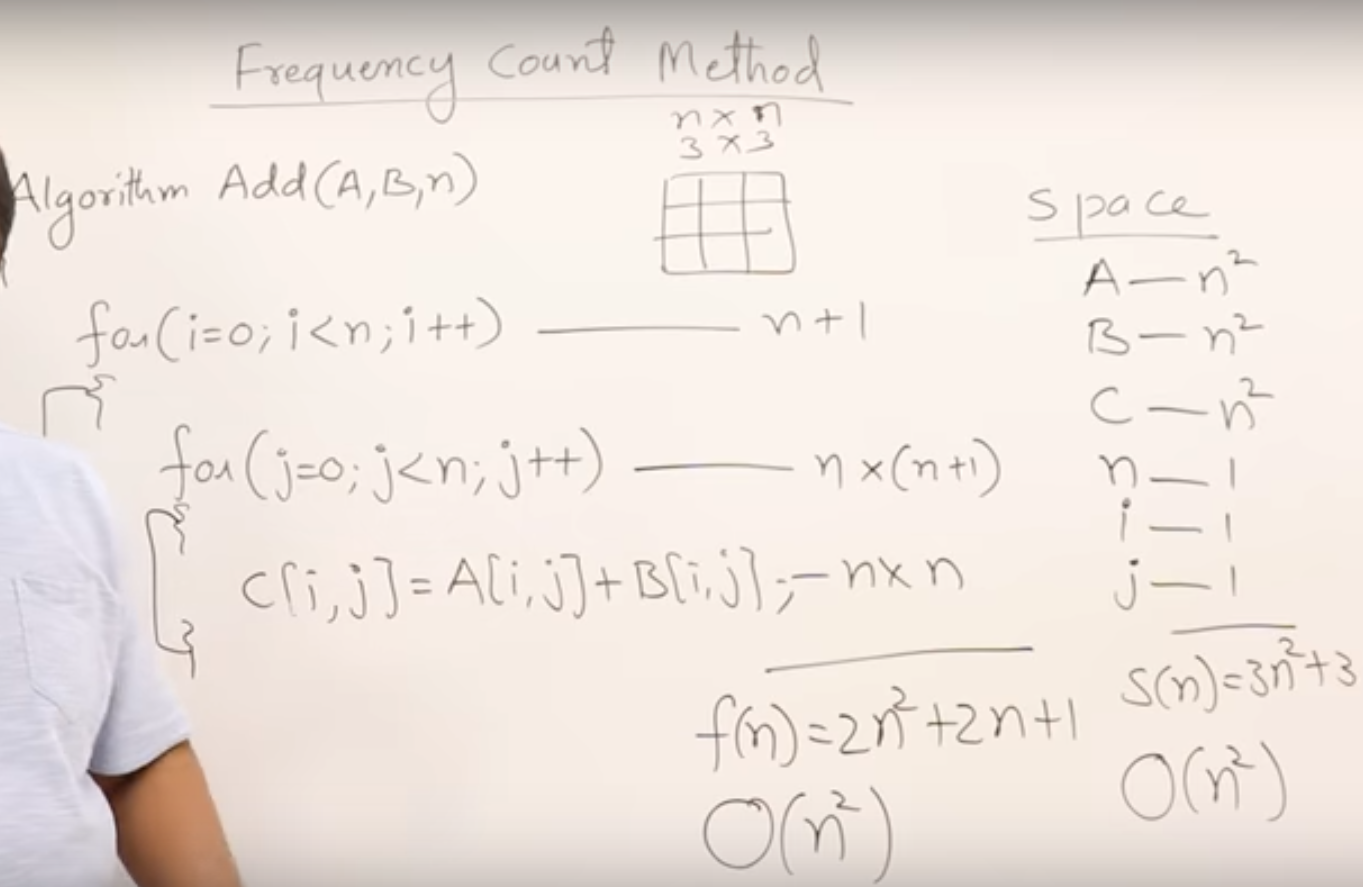


* All simple statements we will consider as 1 unit of time.
* Even if it’s a complex calculation.
* All variables are considered as 1 simple word because we don’t know about its size varies based on its type

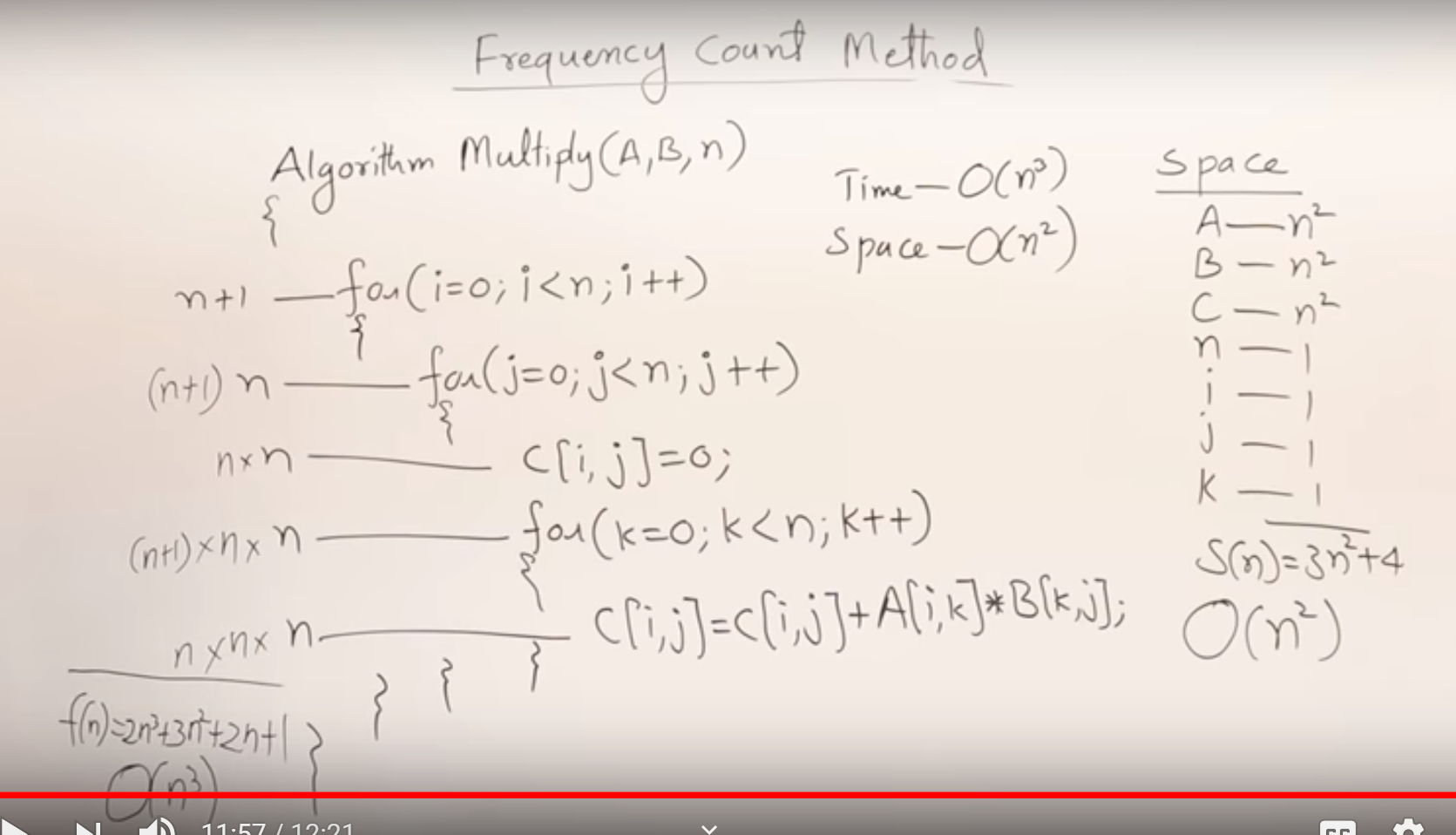
# 1.4 Frequency Count Method



* Sum of an array elements analysis

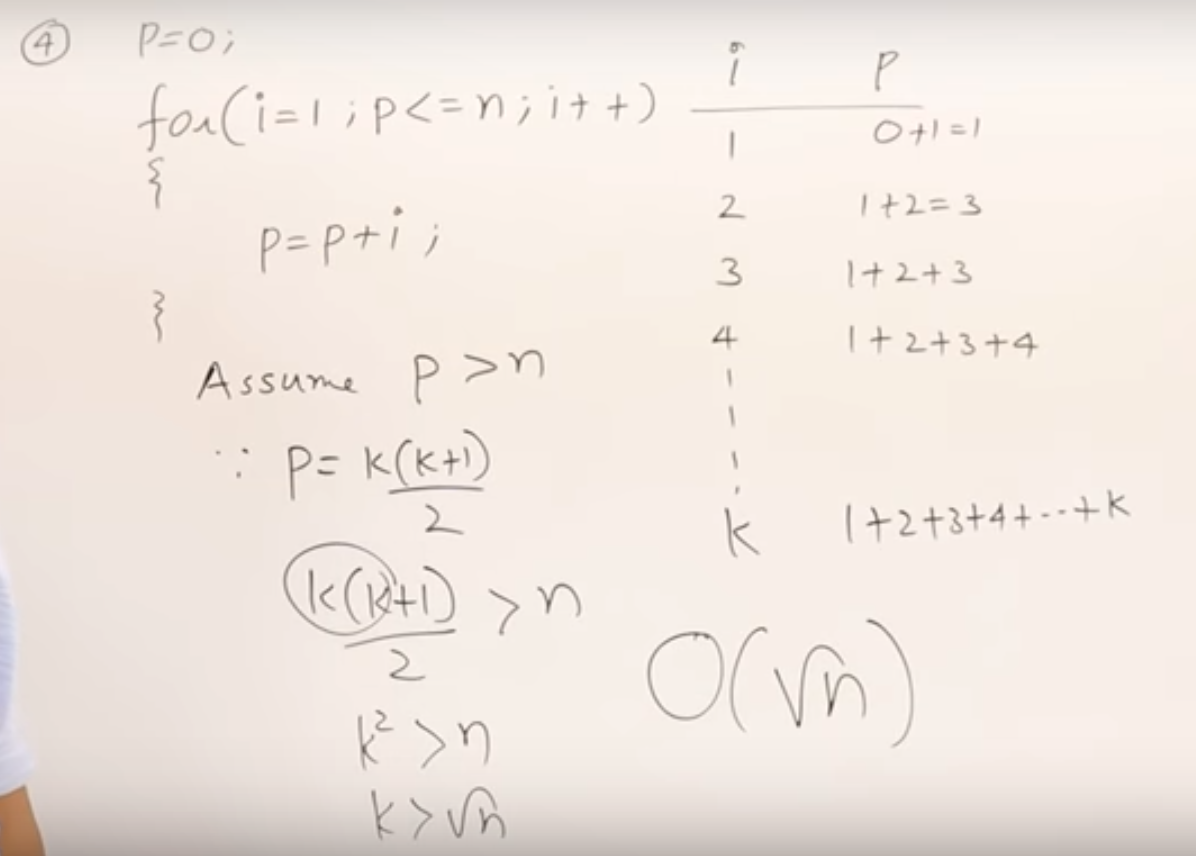


* Sum of two arrays elements analysis

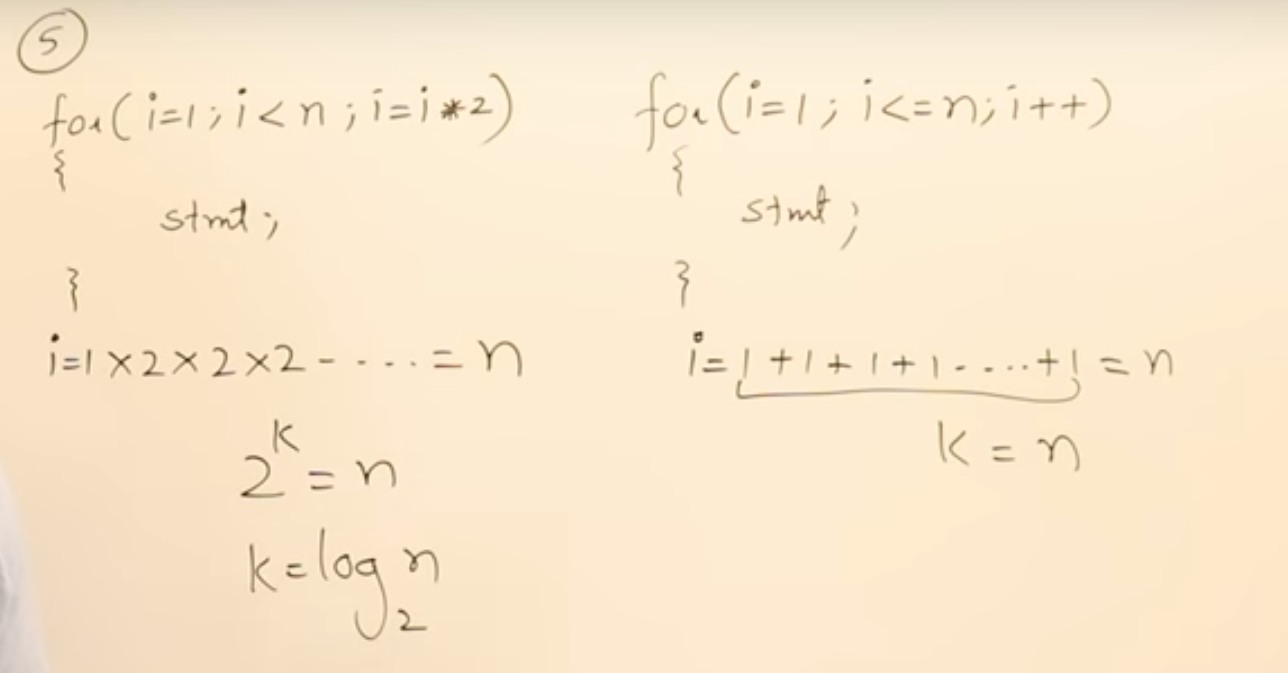


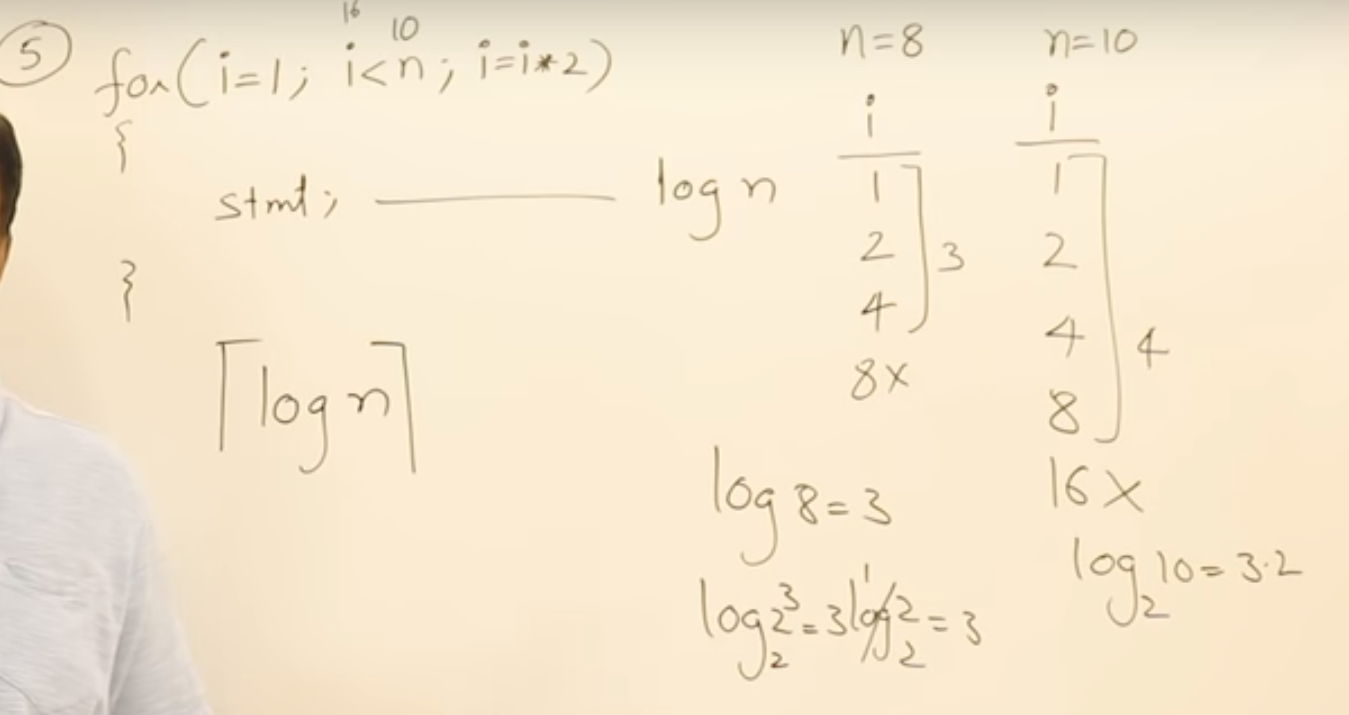
* Multiplication of two arrays elements analysis

1.5.1 Time Complexity #1

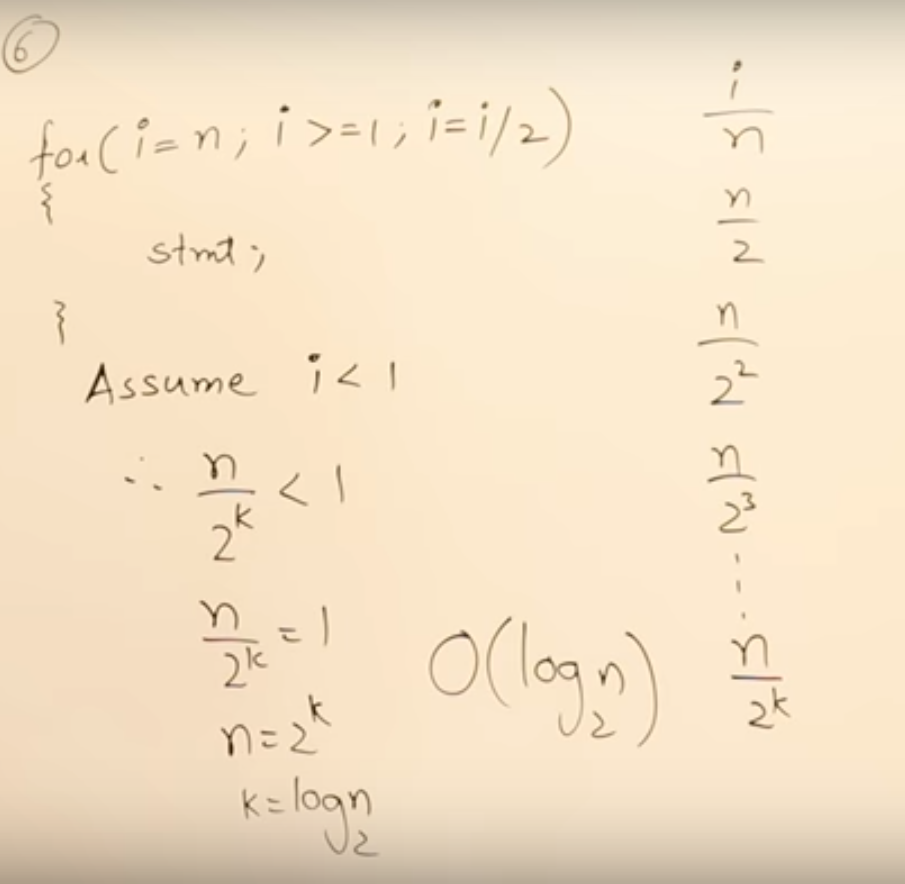


1.5.2 Time Complexity Example #2

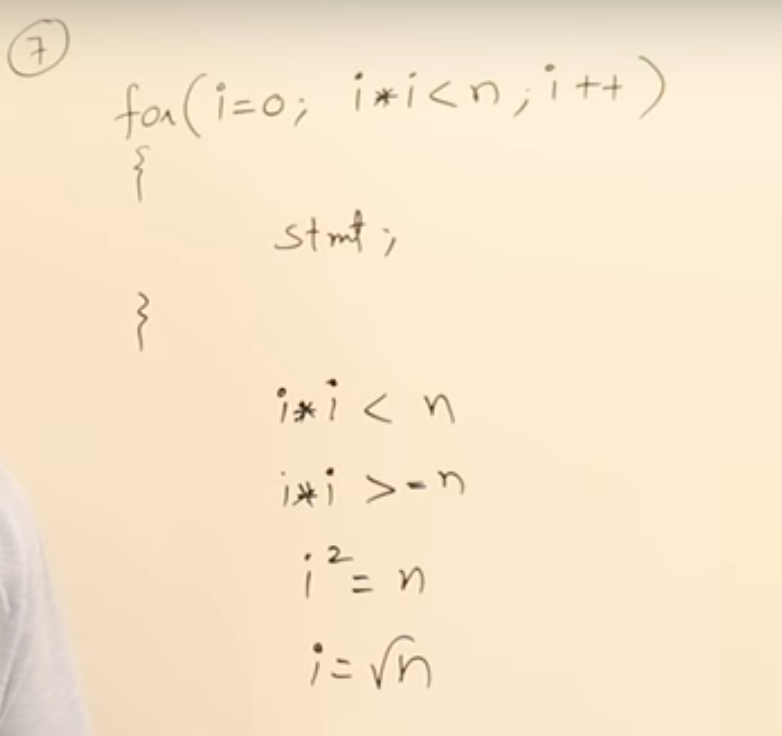


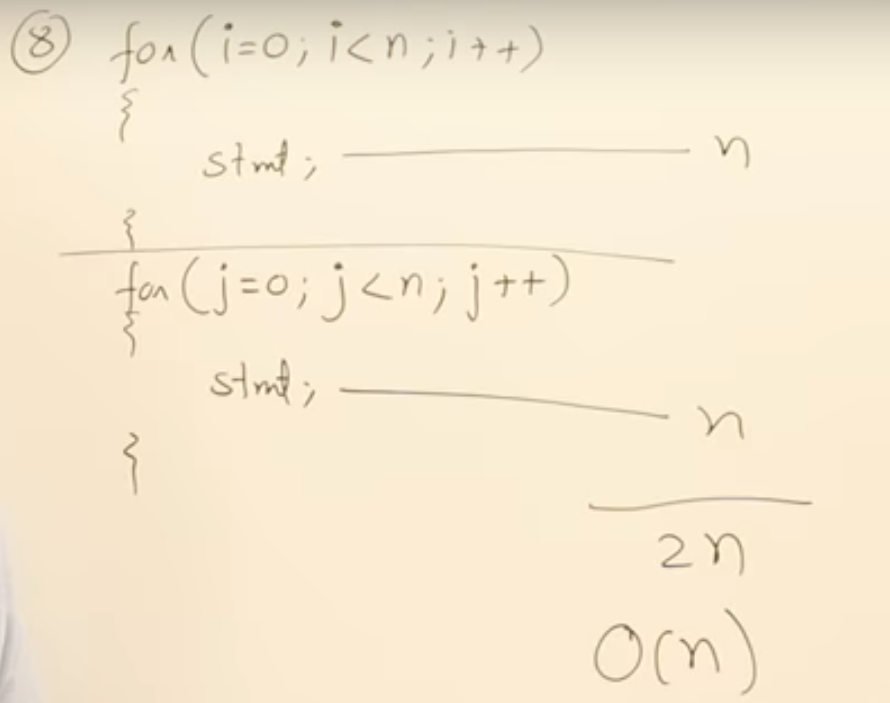


* Log value will be taken as a ceil value
* Observe the difference when n = 8 and n = 10

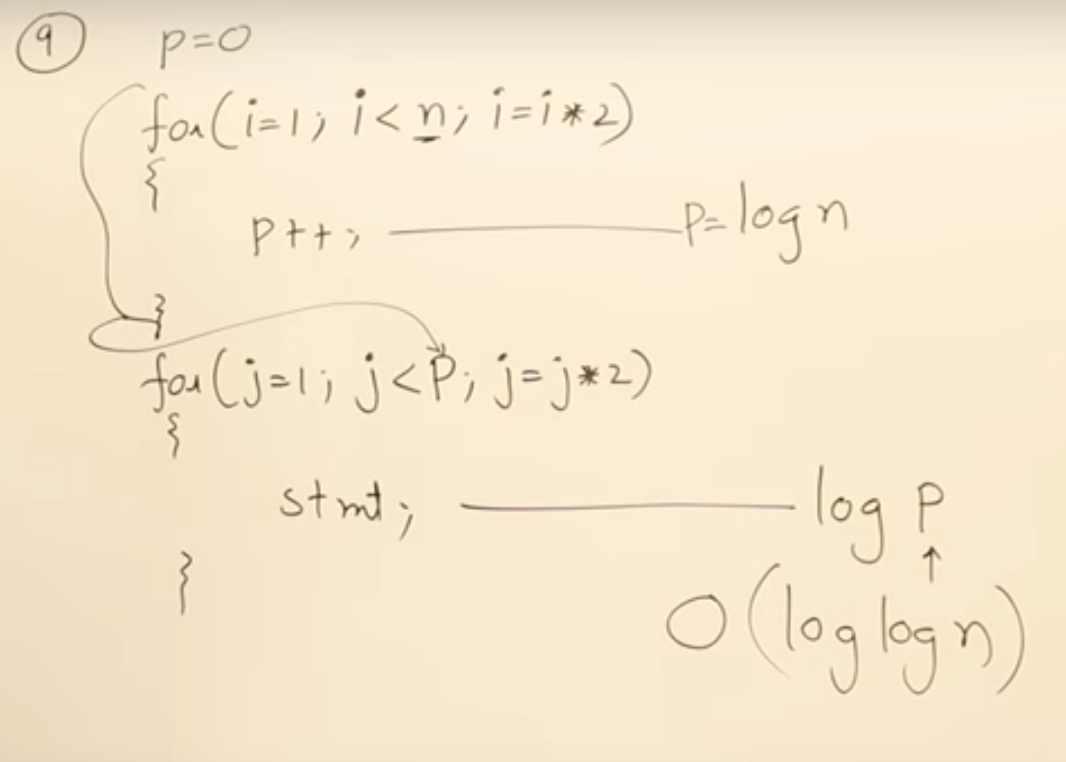


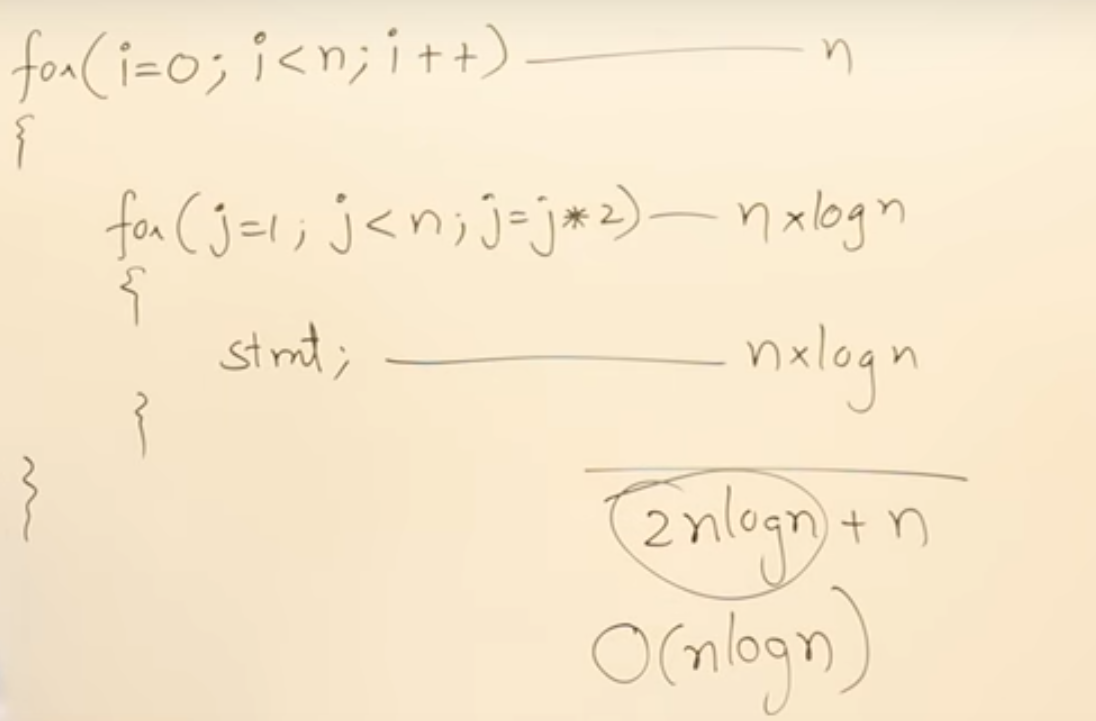
* Multiply or divide by 2 both are **log n**

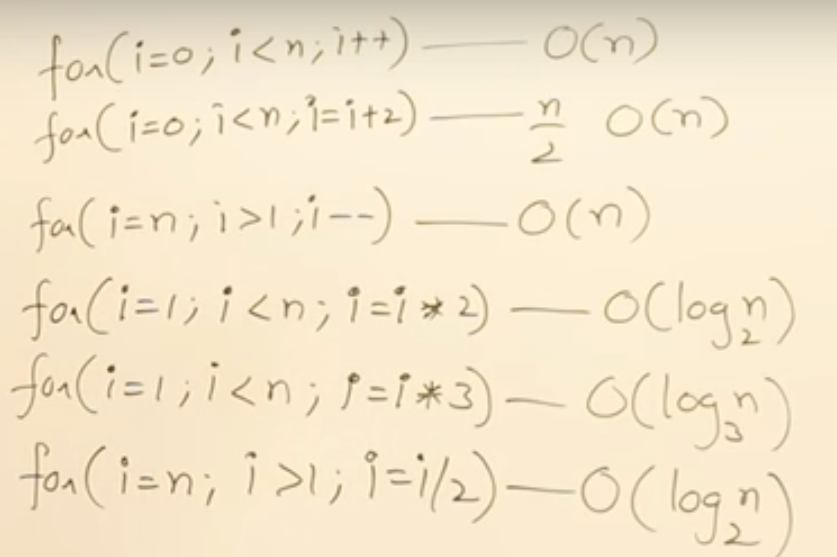




* Analysis of two independent loops







1.5.3 Time Complexity of While and if #3

