# WELCOME TO ENGLISH CLASS

El futuro digital es de todos

MinTIC


Universidad de Caldas

MisiónTIC2022

# WELCOME TO ENGLISH CLASS

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*“Set your goals high, and don't stop till you get there.*

*Bo Jackson”*

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# Classical algorithms: searching and sorting.

# DATE

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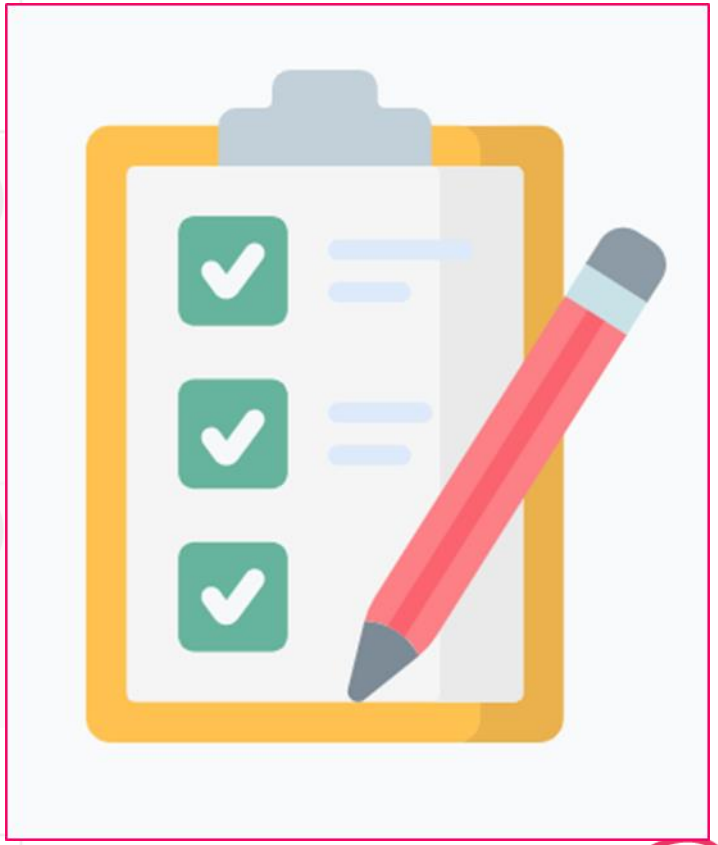
## DATE

**Objective :**

Students will be able to categorize real-life situations into different types of algorithms (such as Searching and Sorting).



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# AGENDA

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**WARM UP:**

Classical algorithms: searching and sorting.

**CLASS ACTIVITY:**

- New Vocabulary
- Reading Strategy: Rereading
- Reading: Top Algorithms You Really Need To Know

- **Wrap- Up:**
- Read the following situations and figure out which of the three algorithms you have to use in each situation: linear search, binary search or MergeSort.

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# WARM-UP

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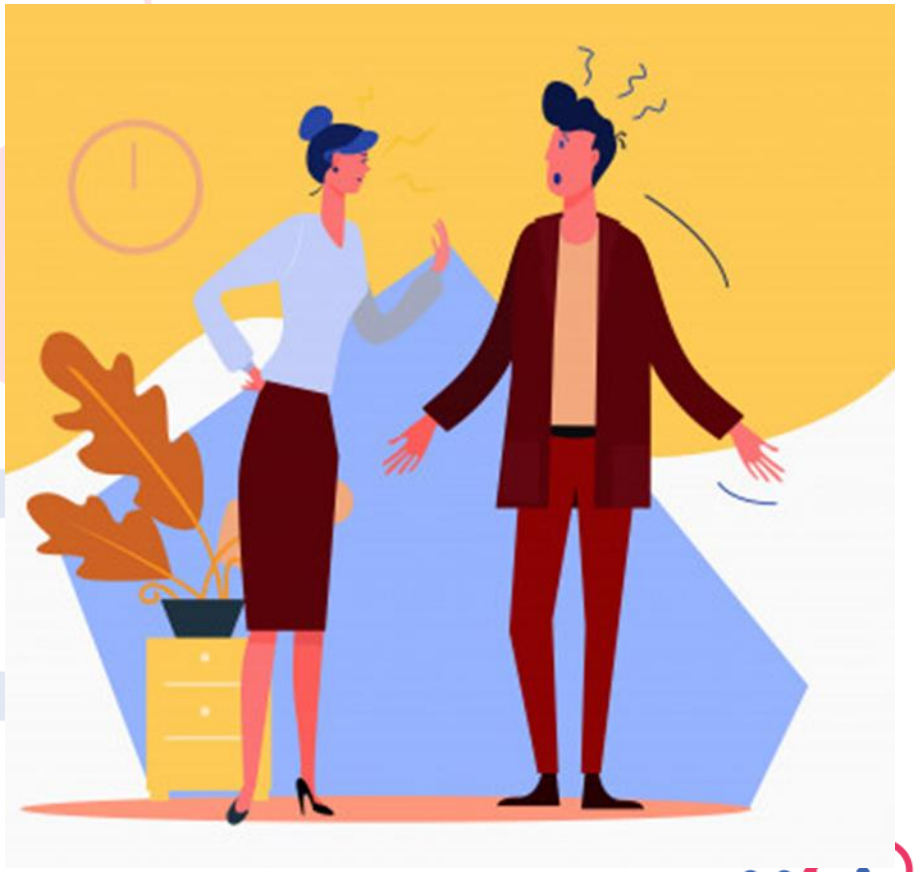
**Do the following tasks:**

1. Order these countries from the smallest to the biggest:
   Colombia Vatican Russia India
2. Order these subjects alphabetically:
   Mathematics Physics Biology Spanish
3. Find the action movie in this list:
   Titanic Conjuring ET Transformers



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# VOCABULARY


search

sort

each

until

input

find

ordered

height

middle

# Match the vocabulary word with the antonym.

1. Search……
2. Sort……
3. Each……
4. Until……
5. Input……
6. Find……
7. Ordered……
8. Height……
9. Middle……

| Antonym | Antonym | Antonym |
|---|---|---|
| Abandon | disorder | none |
| Later | whole | output |
| lose | disorganized | length |
| | | |
| | | |

# Video Reading Strategy

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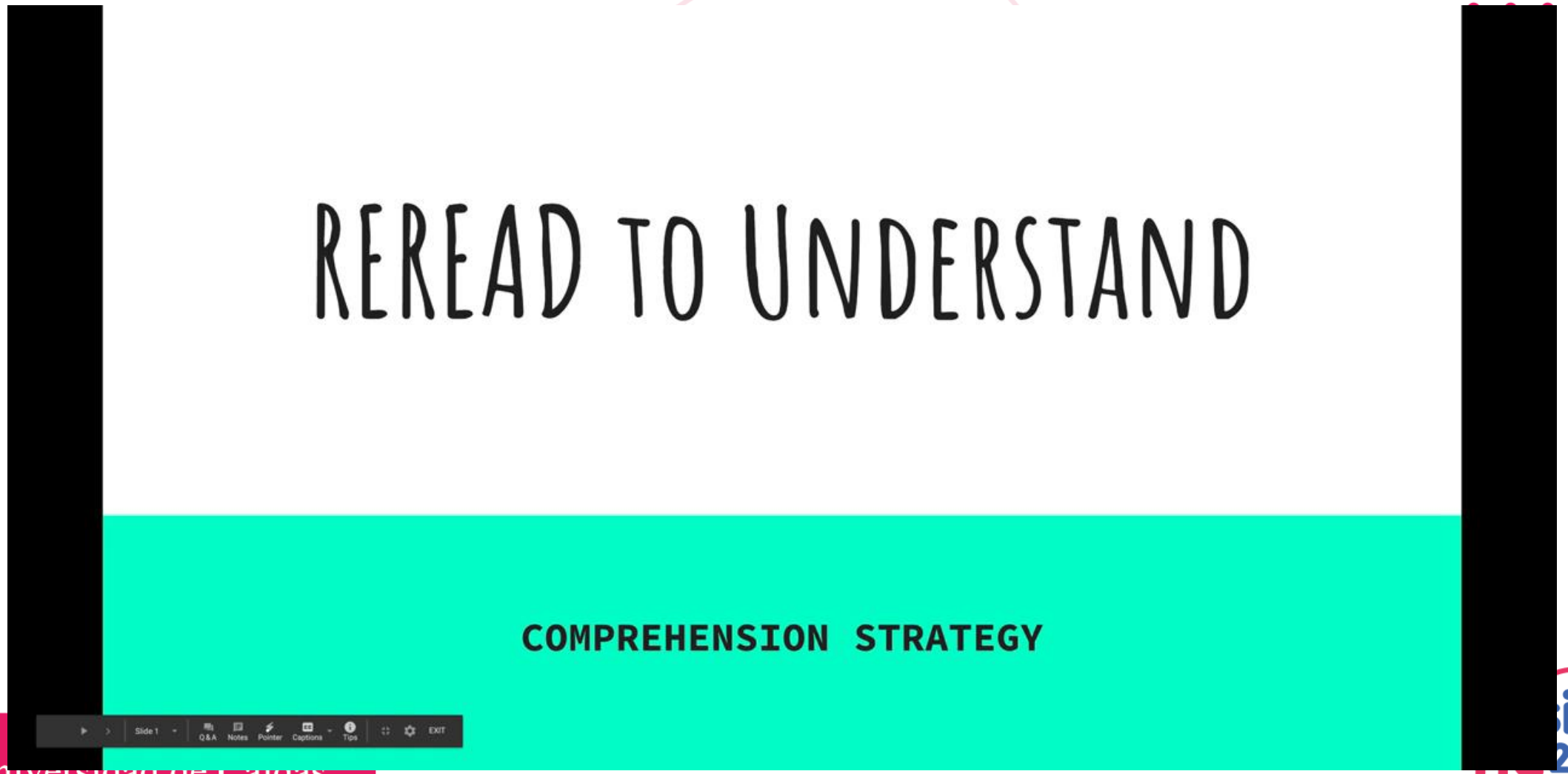
https://youtu.be/c9cpsFV9GOo

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# Text Top Algorithms You Really Need To Know



If you want to become a software engineer, the most basic thing that you have to learn are algorithms and data structures. The more algorithms and data structures you learn, the more useful they will be in your career as a software engineer. To start, let's learn Search and Sort, two classes of algorithms a programmer can't live without. *stop*

## Searching

There are two categories of *search* algorithms we will study: linear and binary.

### Linear search

*Linear search* algorithms means that the program will look at each item in the line (=input) until it finds the necessary item. *stop* If you have 100 items and you need to search for one specific item, then you have to look at every item in the input before you find the necessary item. Linear = simple. *stop* For example: imagine you want to find your friend Maria in a line of people standing in no particular order. You already know Maria´s appearance, so you have to look at each person, one by one, in sequence, until you recognize Maria. In doing so, you follow the linear search algorithm. *stop*

# Text Top Algorithms You Really Need To Know

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## Binary search

*Binary search* (binary - “relating to 2 things”) works by dividing the input into two parts until it finds the necessary item. *stop* One part contains the necessary item and the other part does not. It is faster than linear search, but it only works with ordered sequences – and this is very important, because the linear search does not need an ordered sequence. *stop* For example: imagine you’re want to find your friend John (who is 170 cm tall) in a line of people ordered by height from left to right, shortest to tallest. It is a very long line, and you do not have time to go one-by-one like with the linear search. What can you do? Use binary search. You select the person in the middle of the line, and measure their height. The person is 165 cm tall. You immediately know that this person, and all the people on their left, is not John. *stop* Next, you turn your attention to the people on the right and select the middle person again. The person is 172 cm tall. You can eliminate that person and all the people on the right. And so on, until you find the person who is 170 cm tall – and that is John. In doing so, you follow the binary search algorithm. *stop*

# Text Top Algorithms You Really Need To Know



## Sorting

Sorting is a synonym of ordering. It is one of the most common programming tasks. We will look at one type of sorting - MergeSort. *stop*

## MergeSort

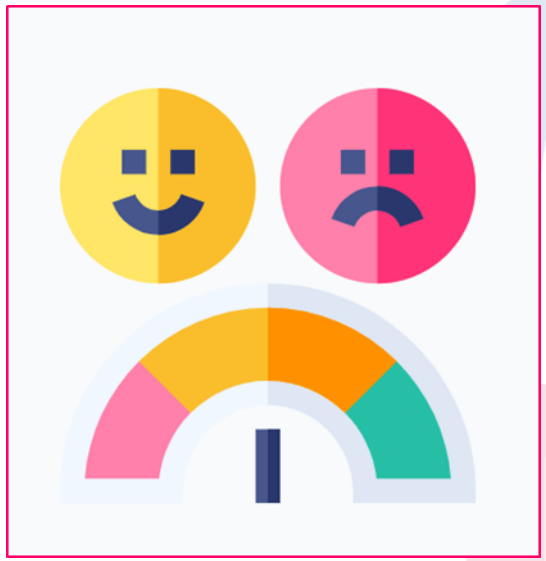
Imagine you have an unordered group of people, and you need to order them by height. First, you divide the group in two; then you divide each of the two groups in two again, and so on – until you have individuals. *stop* Second, you put individuals in pairs; you put the taller person to the right, until you organize all the pairs. Next, you put pairs in groups of four, and order them. *stop*After that, you put the groups of four into groups of eight. And so on, until you have a complete line of people ordered by height. By doing so, you follow the MergeSort algorithm. *stop*

# WRAP-UP

Read the following situations and figure out which of the three algorithms you have to use in each situation: linear search, binary search or MergeSort.

1. There are 30 students in class. You need them to stand in a line according to their age, from the youngest to the oldest, from right to left.
2. You have 15 circles that are ordered in the line from the smallest (2 cm diameter) to the biggest (50 cm diameter). You need to find the circle that is 22 cm in diameter.
3. You are in a supermarket, and your mother asked you to buy coffee that is called “Super Delicious Coffee”.
4. You are in the library, in the section of “Original English Literature”. There are 100 books that are ordered alphabetically. You need to find “Harry Potter and the Order of Phoenix”.
5. There are 10 people in a bank. The oldest people have a priority. You need to make a line of people taking into account the priority: oldest person first, youngest person last.

# SELF-EVALUATION



**Answer the following questions:**

1. Entiendo qué es “linear search”.
   Si No Tal vez
2. Entiendo qué es “binary search”.
   Si No Tal vez
3. Entiendo qué es MergeSort.
   Si No Tal vez
4. Entiendo cómo utilizar la estrategia “rereading”.
   Si No Tal vez
5. La estrategia “rereading” me ayuda a estar más consciente de mi comprensión lectora.
   Si No Tal vez