Contents

Notes: By Nota

Nota

Nota, is a simple script to manage notes. It manages all my class notes which are markdown files and compiles them to PDF versions. This is so people can see my notes and I can share them easier. Not only that but the PDF version makes for easier reading, while the markdown versions are easy to edit and easy to search for items. Hope you enjoy!

Topic: Week 2

Sort

Selection Sort

- Description:
  - Find the smallest unsorted element, and add it to the end of the sorted list
  - Worst Case: $O(n^2)$
  - Best Case: $\Omega(n^2)$

Bubble Sort

- Description:
  - Move higher valued elements to the right, lower to the left
  - Keep swapping adjacent elements until the counter = 0
  - Check to see if sorted if you don't need to swap
  - Worse Case: $O(n^2)$
  - Best Case: $\Omega(n)$

Insertion Sort

- Description:
  - Go through the array and put elements in their correct place
  - For each element find within the sorted section where it belongs
  - Worse Case: $O(n^2)$
  - Best Case: $\Omega(n)$

Merge Sort

- Description:
  - Recursively sorting the array, consider each element individual
  - Sort the left half then right half
  - Worst Case: $O(n \log n)$
  - Best Case: $\Omega(n)$

Search

Linear Search

- Description:
  - Look from left to right for a specified element
  - Still works if element isn't in the array
  - Doesn't have to be a sorted array
  - Worst Case: $O(n)$
  - Best Case: $\Omega(1)$

Binary Search

- Description:
  - Array **HAS TO BE SORTED**
  - Divide and conquer, throw out half the array at a time
  - Worse Case: $O(n \log n)$
  - Best Case: $\Omega(1)$

Recursion

- Description:
  - A function that calls itself during execution
  - Base case for when to stop

Topic: Week 8

SQL

- Description: Database for storing information
- SQL stands for Structured Query Language
- Sole purpose is to query a database

Tables

- Description: Inside your database, you need to store tables.
- You'll have to make every column
- All queries query for information in each row
- Every column can store different types

Data Types

- Int: Stores integers
- SmallInt, TinyInt, MediumInt, LargeInt: Different upper bounds
- Decimal: A.K.A Doubles
- Floats: Floating point numbers
- Date: Current date
- Time: Current time
- Datetime: Specific date and time
- Timestamp: THIS SPECIFIC DATE AND TIME
- Text: A.K.A Strings
- Enums: Only can store limited set of values
- Char: Fixed length string
- VarChar: Variable-length string, also needs max length

Primary Key

- Description: Primary keys allow rows to be uniquely identified
- Also possible to have two rows that together will always be unique
- **MUST HAVE**
- Good idea to have it as an integer and have it autoincrement

Primary Operations

1. Insert:
    - Adds information to a table
    - Skeleton: `INSERT INTO <table> (<columns>) VALUES (<VALUES>)`
2. Select:
    - Extract information from a table
    - Skeleton: `SELECT <columns> FROM <table> (WHERE <condition> ORDER BY <column>)`
3. Update:
    - Modify information in a table
    - Skeleton: `UPDATE <table> SET <column> = <value> WHERE <condition/>`
4. Delete
    - Remove information in a table
    - Skeleton: `DELETE FROM <table> WHERE <condition>`