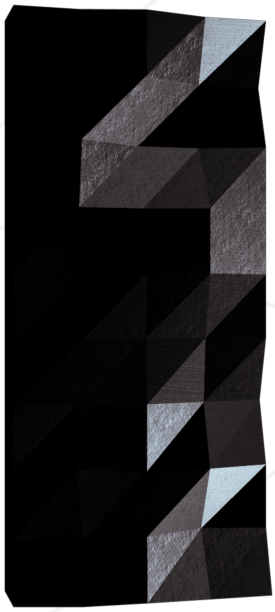

APCSP - Part03

Algorithms Review

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Summary:

Contents

Chapter I

Review - Algorithms

Reply to the following questions with short answers on a text document.

1. What are the three components of algorithms as discussed in the previous PDFs? In your own words, how would you define each one of them?

2. `Psuedocode` is a technique used to write out your logic in a step by step way, but without putting it in the syntax of a real programming language. Take a look at this example code to create an alternating-color chessboard: Chessboard. In your text document, describe what the setup function is doing using pseudocode, one line at a time. Try to write the way you would talk in a conversation - more like a human than a computer.

Chapter II

Multiple Choice

Continue writing down your answers on your text document as you work through the multiple choice questions on the additional PDF attached to this project.

Chapter III

Tower of Babel

`Javascript` is a programming language designed for use inside of web browsers. There are many, many other programming languages in the world and all of them have some reason for existing - they each have benefits and drawbacks and tend to be used for specific types of programs. Which ones, if any, are you familiar with already?

`Algorithms` can be described in pseudocode or in everyday spoken language. When we put them into the precise syntax of a `programming language`, then the algorithm can be understood by a computer. Translating an algorithm from words into code is called `implementing` the algorithm.

Go to the website Rosetta Code and look at the "Guess the Number" example. If you want to run it in the Processing browser, I would modify it like this: p5js Number Guesser.

Choose two programming languages, one that you have heard of before and one which you haven't heard of before, and look at their code for the number guessing game! Then, read about the history and purpose of these two languages and compare and contrast them with Javascript. Answer the following questions about all three in your text document:

- How long has the language existed? Who invented it? Is it popular or unknown today?
- What are the most common uses for the language?
- What are some other programming languages that inspired the creation of this one, or are similar to it?
- What is your impression of the readibility of the language, based on the Rosetta Code example? What percent of the lines in the example could you understand without being an expert?
- What is one technical term that people use to describe how this programming language is different than others? Try to read a definition and do your best to explain what that term means. (Examples include: Object Oriented, Functional, Procedural, strongly-typed, weakly-typed, dynamic, compiled, or any other new words you discover that you didn't know before. Don't spend more than 20 minutes trying to understand perfectly!)

Chapter IV

Code Translation

IV.1 Translate the following pseudocode into real code in p5js

- Create a sketch with a white background.
- Create a blue circle. Its coordinates, x and y, should be saved in the global scope so that they can be updated within mouseClicked().
- If the user clicks within 100 pixels of the top edge of the screen, the circle will shift up 10 pixels. If the user clicks within 100 pixels of the right edge of the screen, the circle will shift right 10 pixels. The same logic should apply to clicking on the bottom or left edges of the screen. It's okay if the click matches more than one if statement and the circle moves twice.
- Each time a valid mouseclick is made, add the description of the move ("UP", "DOWN", "LEFT", or "RIGHT") to an array on the global scope that keeps track of past moves.
- Every time the mouse is clicked (no matter where) print the length of the past move array to the console.

IV.2 Bonus steps!

- Before moving, check if the circle is already at the edge of the canvas, and make it stop as if hitting a wall.
- After the number of moves reaches a certain number, stop recognizing mouseclick and instead 'rewind' the blue circle by running all the moves in reverse.
- SuperBonus: Research how KeyPressed() works and make the blue circle controlled by w,a,s,d or the arrow keys as well!

Chapter V

Additional Review

Need more help? If you feel that you don't understand how to write code with if statements, functions and looping yet, try working through the Khan Academy lessons at Intro to JS Drawing and Animation, or the Coding Train playlist on Learning Processing.