

Summary of GitHub Portfolio Contents

Object Oriented Software Development

A Rail Fence Cypher

A command line menu-driven Java application capable of encrypting or decrypting a short message or file using a Rail Fence Cypher. A Rail Fence Cypher is a transposition cypher that creates an $n \times k$ matrix of characters to encrypt plaintext (n is the length of the plaintext and k is the key). The plaintext characters are then written into the matrix in a zigzag pattern. The cypher text is created by appending the character set in each row to a string. Decryption involves the transposition being undone.

Advanced Object Oriented Software Development

Generating A Word Cloud From Text

Word Clouds provide a visual representation of text, typically displaying words with the most frequent occurrence prominently. This command line menu-driven Java application is capable of parsing a file or URL, the name of which is input by a user, and creating a PNG file with a word cloud displaying the most prominent words in decreasing font size, style and colour.

Agile Software Development

Agile Methodology Recommendation

A report to recommend an agile methodology to a new company. The company's goal is to produce a rival to the e-commerce website Amazon and has hired a team of talented Software Developers to do this. The company has narrowed the selection down to Extreme Programming or Scrum however is uncertain as to which agile development model to follow. This report includes information to help with the decision and a recommendation.

JUnit Automated Test Suite

A JUnit automated test suite capable of testing a Java Insurance Program application. The program calculates car insurance premium based on age. Java code for the program was supplied by the lecturer and then refactored to facilitate testing. The test suite contains a range of annotations and tests for two different kinds of exceptions.

Computational Thinking With Algorithms

Sorting Algorithms

A Java application to benchmark five different sorting algorithms: Bubble Sort, Counting Sort, Insertion Sort, QuickSort, and Selection Sort. The application includes implementations of the five sorting algorithms with a method to test them. The running time for each algorithm is measured ten times, and the average for each algorithm and each input size is output to the console when the program finishes. The project contains a report including information on sorting algorithms, the process followed when implementing the application, and a discussion on the results of the benchmarking.

Computer Architecture and Technology Convergence

Assignment Part 1: Binary Arithmetic

A number of short tasks requiring knowledge of binary arithmetic to complete e.g. rewriting base-10 numbers as 8-bit two's complement integers, drawing up truth tables for circuits.

Assignment Part 2: Linux

A number of tasks requiring knowledge of Linux including interpreting output of Linux commands and grouping commands together into a shell script, written using the Vim text editor to automate execution.

Database Design and Development

Database For A Dental Practice

A database that can be deployed in a commercial database management system, the scenario in this case is a dental practice. The project contains a PDF schematic of the database, the SQL script used to create the database, an SQL script with queries which can be used on the database, a PDF describing how Codd's rules can be applied to the database, and a PDF including instructions on implementing the project.

Mobile Applications Development

Ionic Country, Weather And News Reader

An ionic mobile application that reads news, weather and country data from internet resources. The application consists of a homepage and a settings page. The settings page allows a user to enter a city for which weather data will be displayed and to select the units in which weather data is presented. These settings can be saved. Once a city has been saved, weather and news for the city is shown in the homepage, if available.

Network Technologies

Networking with Cisco Packet Tracer

An assignment to set up a small network using Cisco Packet Tracer. An addressing scheme was designed to divide the network space into subnets, allowing for up to 30 hosts per subnet. The network was built and configured based on the addressing scheme, with all devices on the network able to reach each other.

Network-based chat application in Java, using the Java Socket API

A network-based chat application in Java including a client program and a server program. The server starts and waits for socket connections on a specific port. The client starts and attempts to create a socket connection to the server. If a connection is successful, the client and server should be able to facilitate a text-based chat session between users, allowing the user(s) to enter text at the command line. The project includes a design document.

Operating System & Cloud Computing

A WordPress website hosted on a cloud-based LAMP server

An AWS cloud-based LAMP server was built to host a website. The website is centered around an operating system of choice, Zorin OS in this case, and includes a number of separate pages with information pertaining to the OS. The website has a domain name, contains WordPress plugins and widgets, and the ability to track website activity via a connected analytics server.

Web Applications Development

Business Website Assignment

An e-commerce website for a flower business created using HTML5, CSS and JavaScript. The website includes a slideshow which displays a different image each time the page is loaded. It includes validation to ensure text fields are not empty and a valid email address is entered. The user can purchase items from the site (in theory), enter their login details, and have login details validated before receiving a summary of the order. The website connects to a database that contains product information.