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Introduction

This book introduces many mathematical and computer science terms like Fibonacci, graph, recursion, queue, stack, Dynamic Programming, Kruskal, Dijkstra, BFS, etc. While these concepts all have rigid definitions and are not easy to grasp at a glance, this book tries to describe them in simple sentences. It invites the audience to adventure the thinking process and naturally come up with the solution steps. Without forcefully knowing it, the audience will master the skill of algorithmic thinking.

Coming up with the right names for the characters in this book is equally important as making the algorithms and programs right. The names sparkle the inspiration. Spending excessive brain power gazing at the cosmos without a clue, but with a flash on the screen, the characters jump out of the computer! Computer world is an Animal Kingdom, our characters live in this Kingdom —

The sky is blue; the grass is green. Deep in the forest lives the BestFour:



Dark Knight -
gallant hero and adventurer,
earn admiration from others,
leader



Banana Split -
intelligent, enthusiastic,
humorous, and sociable



Bubble Gum -
creative, good memory,
cheerful, seek peace and
kindness



Mighty Python -
artificial intelligence,
the force of algorithms
and code

Computer World is an Animal Kingdom



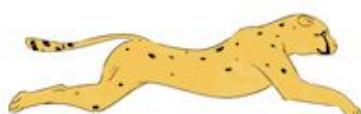
From as big as Elk (analytics software) to as tiny as Ant (build automation tool)



From as friendly and social as Llama (heterogeneous system development) to as deadly and evil as Cobra (OOP language)



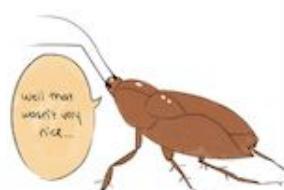
From as sleek as Penguin (graphical user interfaces development) to as sharp as Porcupine (web app server)



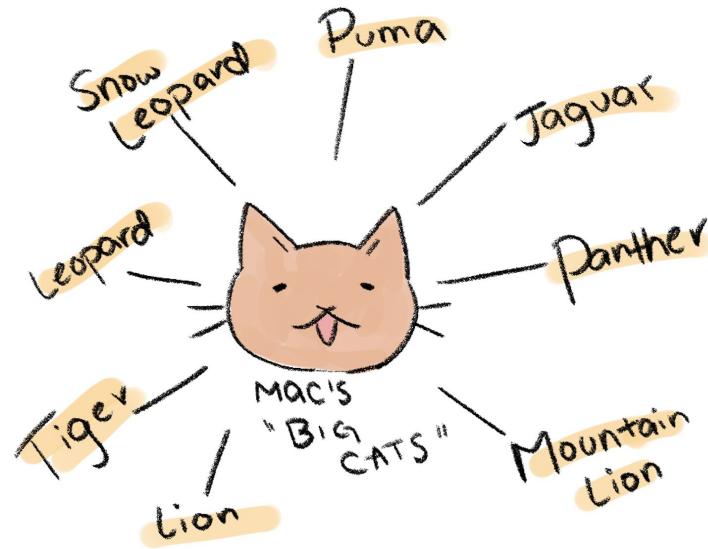
From as fast as Cheetah (template engine) to as slow as Sloth (slowest language by Larry Page)



From as elegant as Orca (parallel application development) to as gross as Cockroach (SQL Database)



Programmers just cannot have enough animals. They added a WHOLE pack to the macOS big cat family: 10.0 “Cheetah”, 10.1 “Puma”, 10.2 “Jaguar” ...



You get the point!

Fun Fact!

Is Python language named after the snake?

When Guido van Rossum began implementing Python in the 1980s, he was watching the comedy series “Monty Python’s Flying Circus”. Van Rossum thought he needed a name that was short, unique, and slightly mysterious, so he decided to call the language Python. The language was first released in 1991 [21].

Why Python?

Python is an easy-going friend to make. If you know the English language, you've known a portion of Python! It resembles the English language and focuses on what you want to achieve but not the programming language itself.

Python is a celebrity on all computer continents: Windows, macOS, Linux. Your Python code will work no matter where it runs.

Python is a big brain for you to pick, the artificial intelligence brain. With the support of Python clans (libraries) like ‘**Numpy**’, ‘**Pandas**’ and ‘**Matplotlib**’, Python handles statistics, matrix data, and visualization very well. Whatsmore, some of the strong family members, “Keras”, “TensorFlow” and “OpenCV” enable artificial intelligence. It’s like you have two brains now.

Target Audience

This book is designed to introduce the essential framework that computer science, math, and even our lives are built upon: algorithmic thinking.

- For beginners, there are no prerequisites as long as you keep an open mind.
- For programmers, we offer Python code and Pygame, both in play and demo modes, for you to craft.

We have identified a set of fundamental algorithms after lots of pre-work analyzing the questions in the USA Computing Olympiad (USACO) and CS job interviews. We weave the algorithms into the adventures.

Do algorithms sound like a terrifying monster topic? Don’t worry. Algorithm, in simple words, is the sequence of steps to solve a type of problem. We will grant our audience a magical lens called CalliLens.



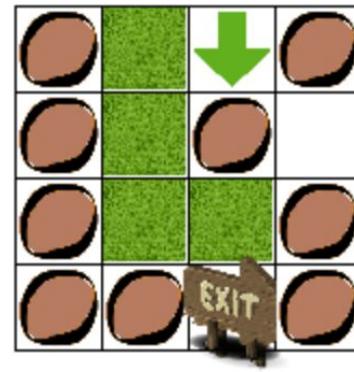
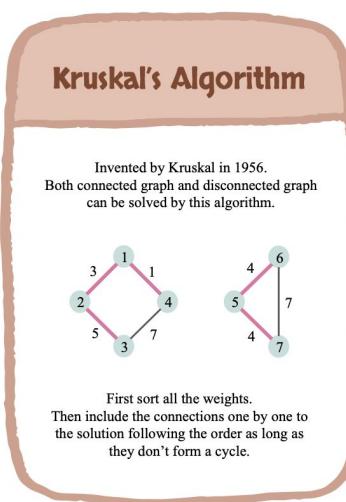
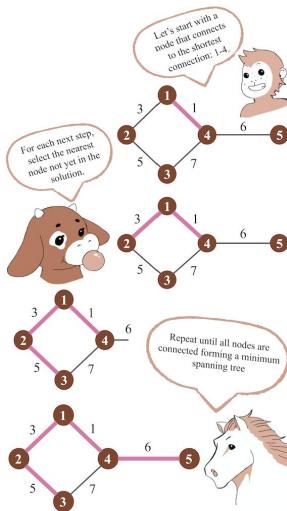
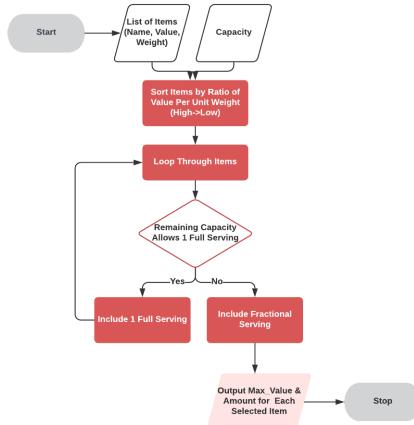
It is a symbol for a set of problem-solving methods that are used to abstract the problems and identify algorithms as their solutions in a computer-understandable way. With this lens, we will see a crystal clear world out of the chaotic reality.

We also weave in lots of visual illustrations and fun facts.

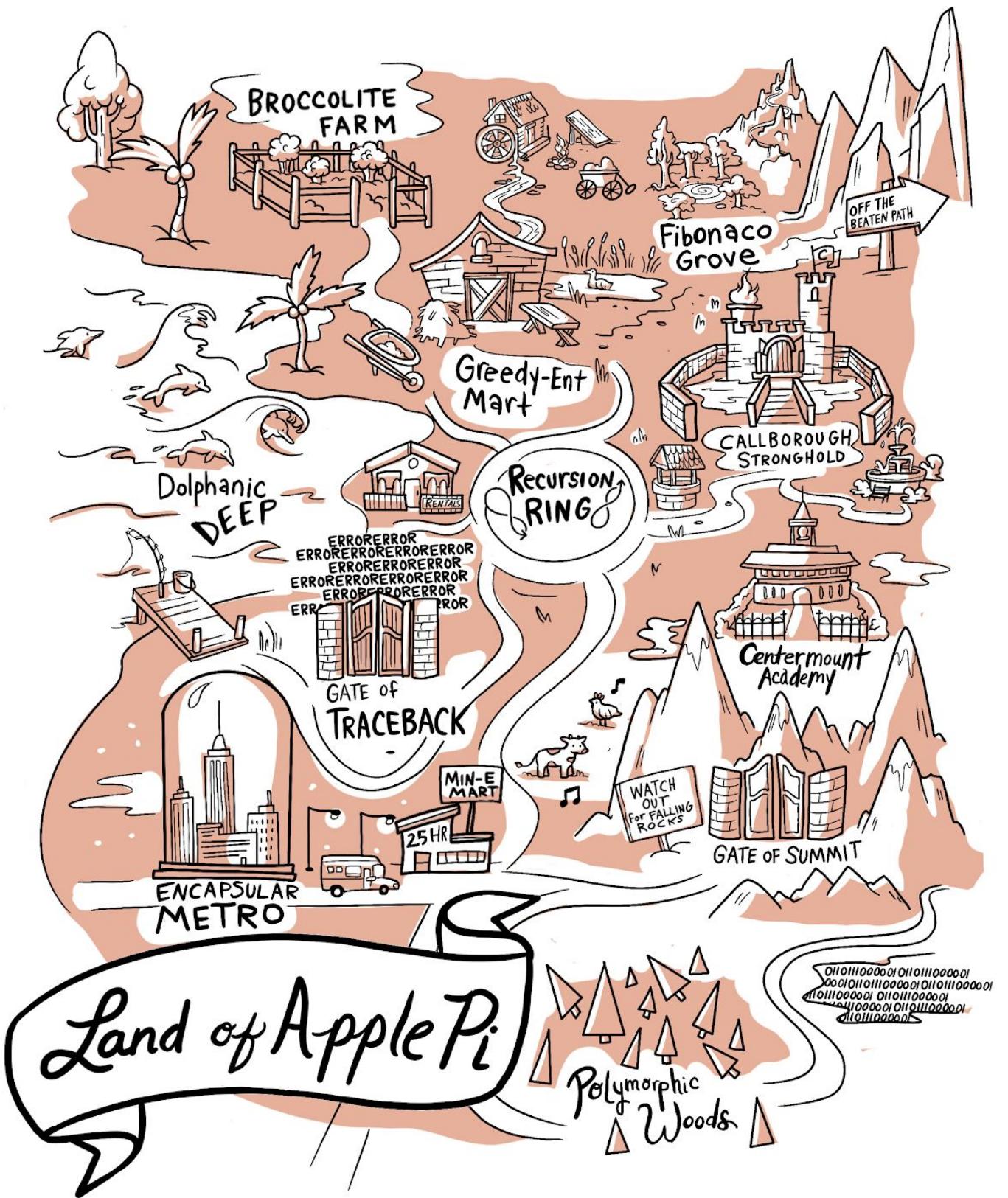
Codephile



If coding is coffee, the flowchart will be the coffee mate!



The story will take place on the Land of Apple Pi. "Apple" is the symbol for realization, healthiness and innovation (Newton's apple, an apple a day keeps doctor away, Apple laptop). Pi is for Math. Welcome!



By the way, do you have to love animals to continue reading this book? No, but it'll help us make a better world if you start now.

And oh, if you have a better solution than the one presented in the book, please share the joy with us!

Now let the adventure begin!