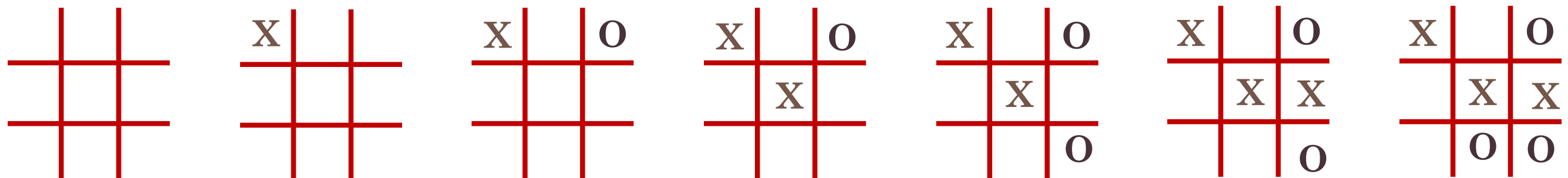# Computational Thinking
and
'AI' for
Tic-Tac-Toe Game

Tic-tac-toe Game

To illustrate the programming concepts we have learnt

- implementation of a simple game of Tic-tac-toe

- using the various features provided in Python

- and the concept of computational thinking

Computational Thinking

A problem solving process to solve a complex problem (using computer program)

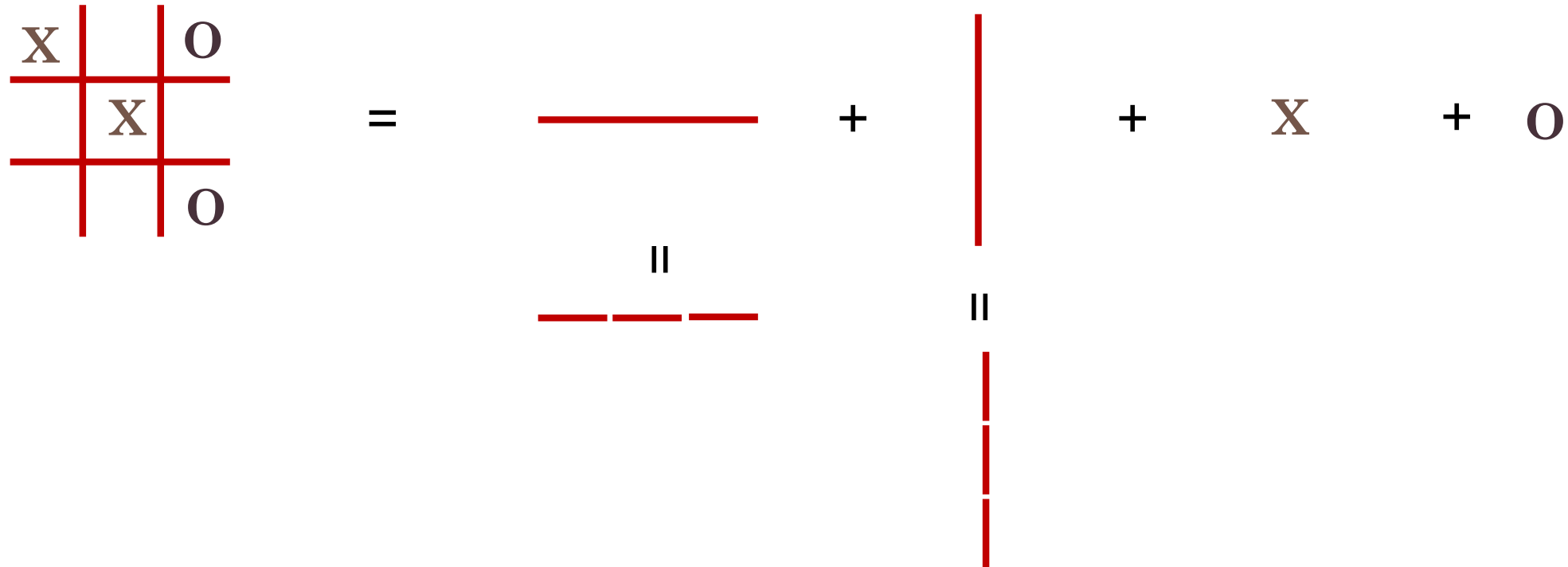Four basic elements in the Computational Thinking process

- Decomposition

- Pattern Recognition

- Abstraction

- Algorithm Design

Decomposition

The breaking down of a complex problem into smaller subproblems

- each subproblem is then solved separately
- combine their solutions to solve the original problem
- 'divide-and-conquer' approach

Pattern Recognition

The process of finding similarities after a problem is decomposed

- can reuse the basic entities for multiple instances of the subproblems identified

E.g. using iteration and loops in the programme code

Abstraction

Simplify the complexities of the problem through hiding of low level details

- focus on high level view of solving the problem

Examples of abstraction in Computing

- Procedure abstraction using functions

- Data abstraction using data structure

- Computer platform abstraction using high level language

Algorithm Design

The step-by-step instructions that we give to the computer

- for it to find the solution to the problem

Common to be done using pseudo code

- but with Python

- easy to understand and simultaneously implement

Task: Tic-tac-toe Game

Using the concept of computational thinking

- implement a Tic-tac-toe game

- where a person will play the game against the computer