



Automata Formal Languages & Logic

Introduction to the Course

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Automata Formal Languages & Logic

Introduction

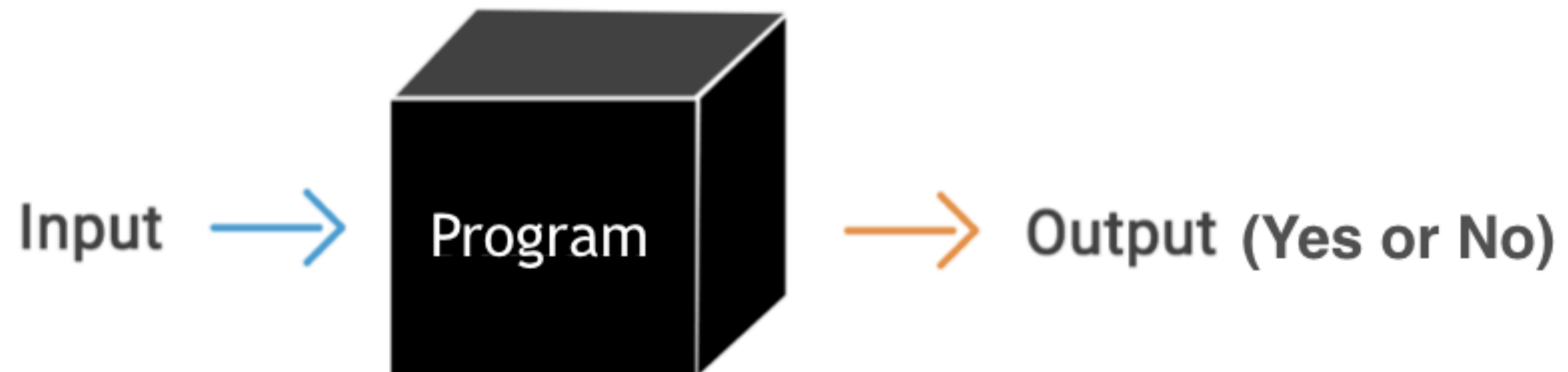
Applications :

- Compiler Design
- Natural Language Processing
- Regular Expressions
- Electronic Circuits
- Model Network Protocols
- Video game Character behavior
- String Searching

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Introduction

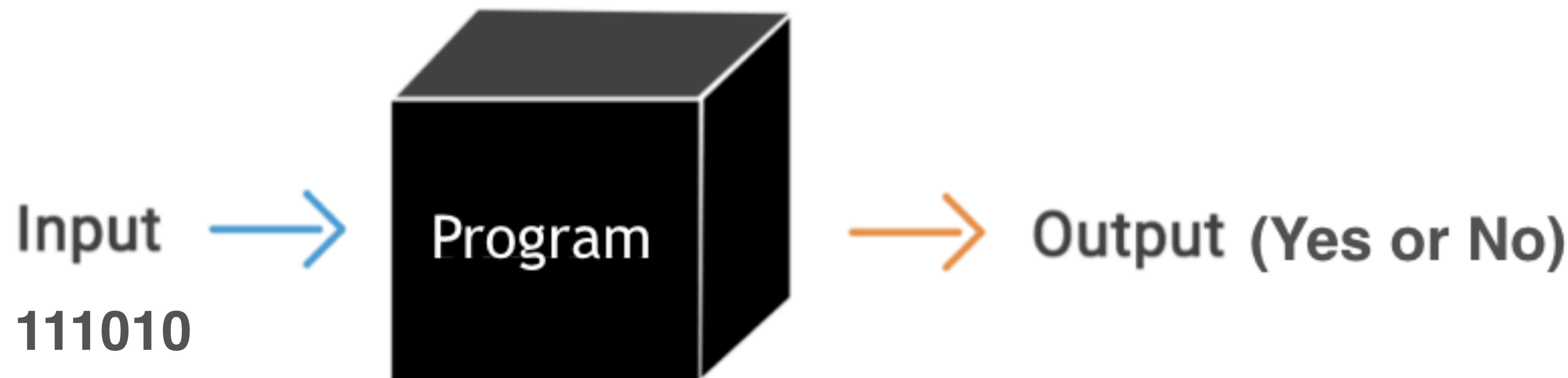
What does it mean to Compute something?



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Introduction

Compute a Set of binary Strings that end in 0.



Decidable

Traverse to the end of the String
If the last bit is 0,
 Output Yes
else
 Output No

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Introduction

Compute a Set of binary Strings that represent a legal java program

```
import java.util.Scanner;
public class PrintCalendar {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        // Prompt the user to enter year
        System.out.print("Enter full year (e.g., 2012): ");
        int year = input.nextInt();

        // Prompt the user to enter month
        System.out.print("Enter month as a number between 1 and 12: ");
        int month = input.nextInt();

        // Print calendar for the month of the year
        printMonth(year, month);

        // Print the calendar for a month in a year
        public static void printMonth(int year, int month) {
            // Print the headings of the calendar
            printMonthTitle(year, month);

            // Print the body of the calendar
            printMonthBody(year, month);

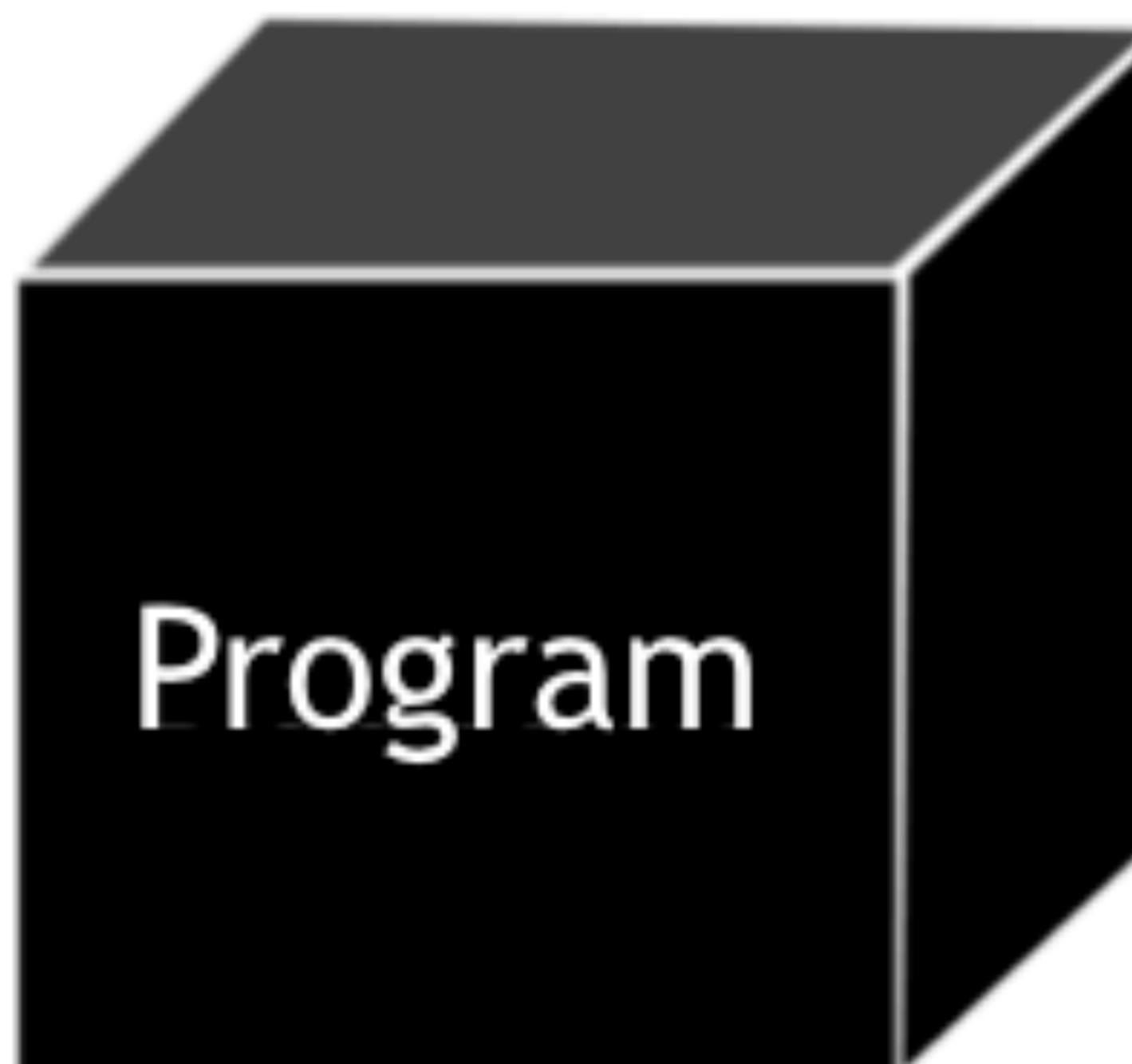
            // Print the month title, e.g., March 2012
            public static void printMonthTitle(int year, int month) {
                System.out.println(" " + getMonthName(month)
                    + " " + year);
                System.out.println("-----");
                System.out.println(" Sun Mon Tue Wed Thu Fri Sat");

                // Get the English name for the month
                public static String getMonthName(int month) {
                    String monthName = "";
                    switch (month) {
                        case 1: monthName = "January"; break;
                        case 2: monthName = "February"; break;
                        case 3: monthName = "March"; break;
                        case 4: monthName = "April"; break;
                        case 5: monthName = "May"; break;
                    }
                }
            }
        }
    }
}
```

Java Program



Binary File



Compiler



Decidable



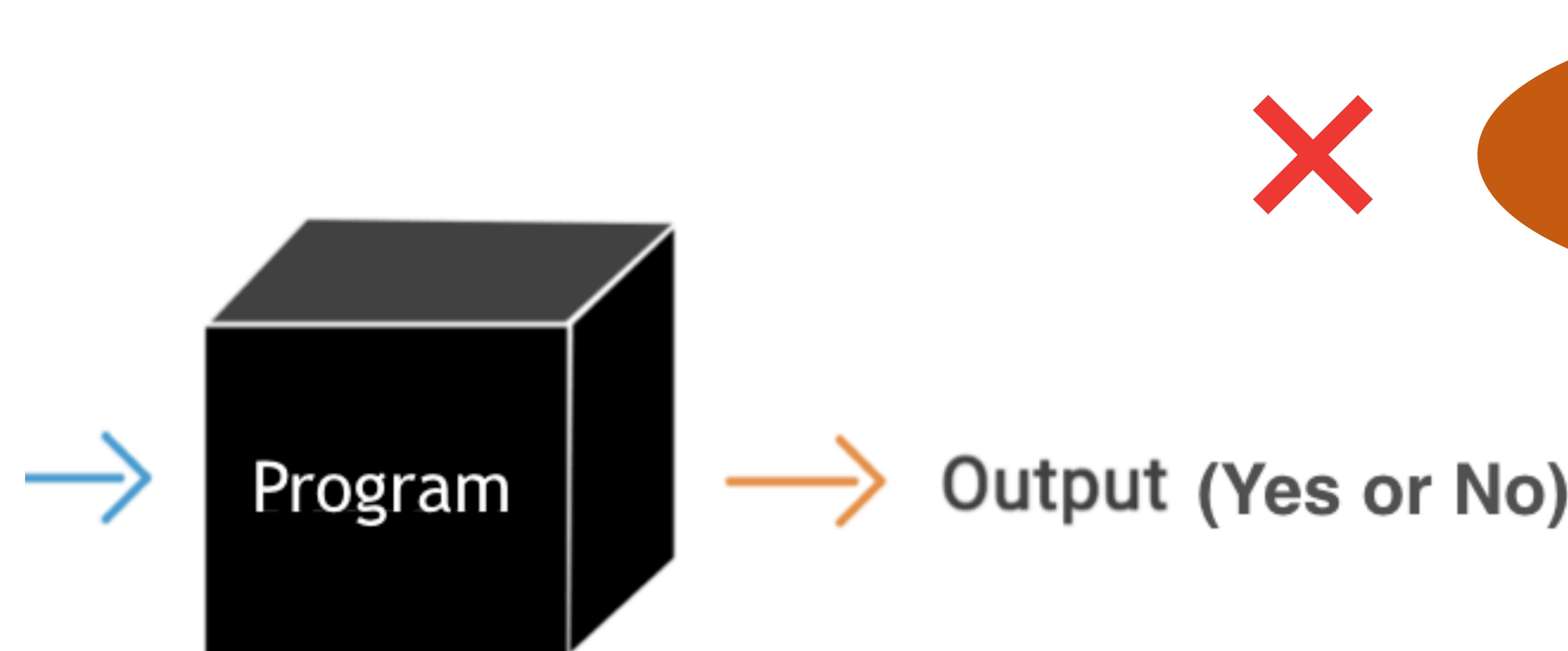
Output (Yes or No)

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Introduction

Compute a Set of binary Strings that represent a java program that never enters into an infinite loop.

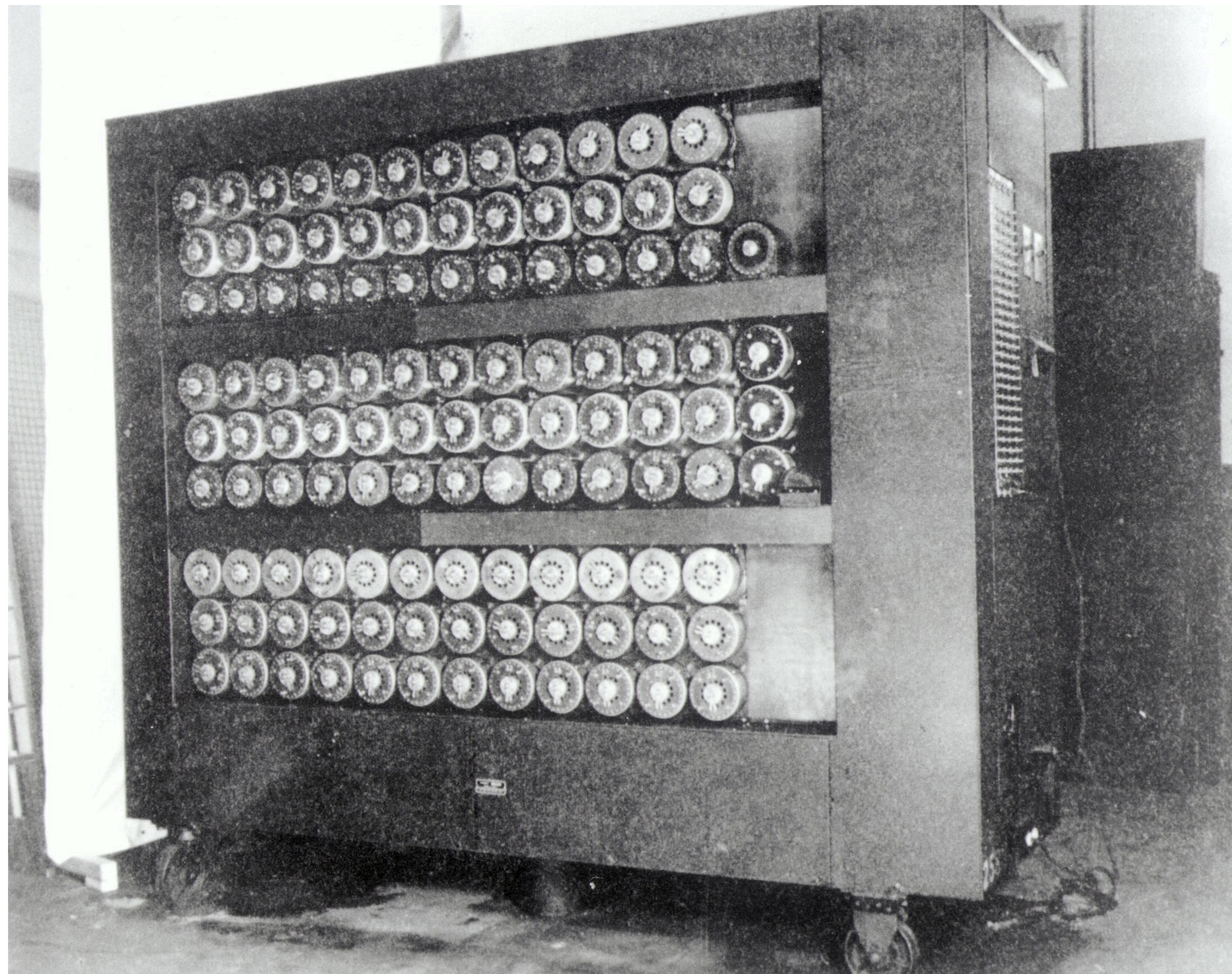
```
1110011111111111000000  
000101011111100011101111  
11100100001100000001000000  
00001011111011110001101111  
00011010010111100010111111  
11111110011111100101011111  
100011010111001011001100001  
111100010010110111110000010  
00011111111111110100001  
1100100111110101101111110  
111110111111111111011001  
11111011110011111111111111  
11101000100001101111111110
```



Binary File

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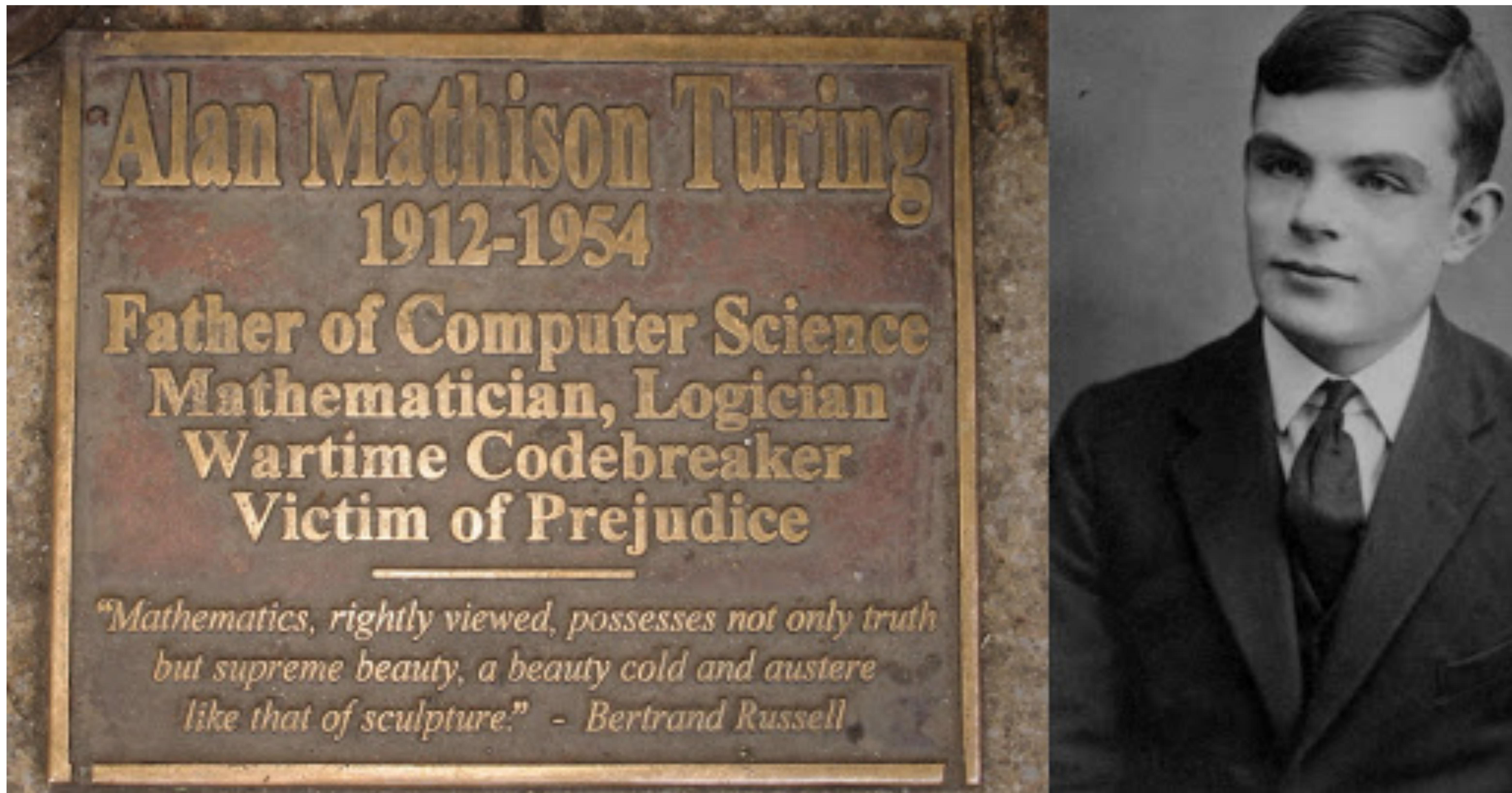
Introduction



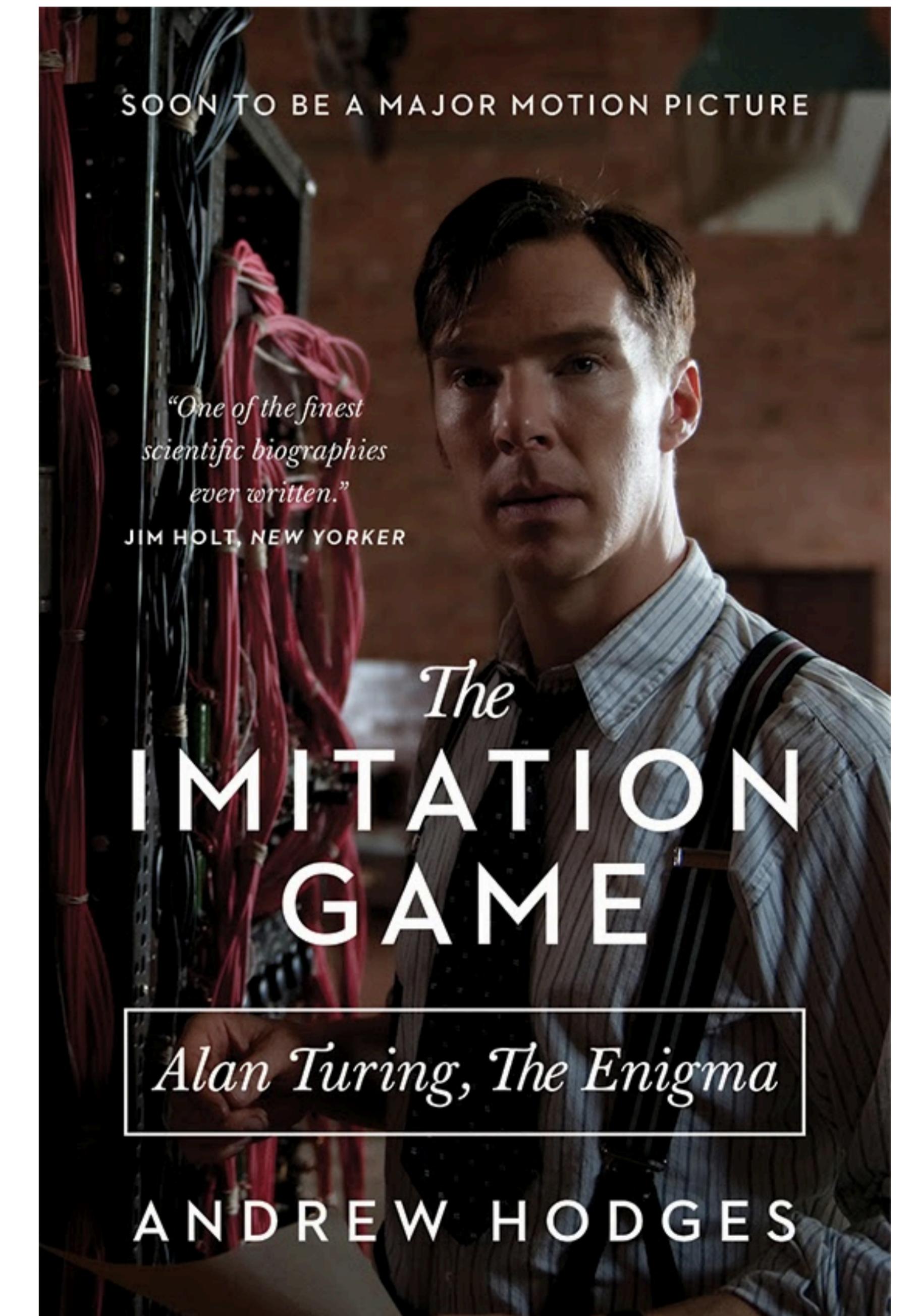
Turing machine

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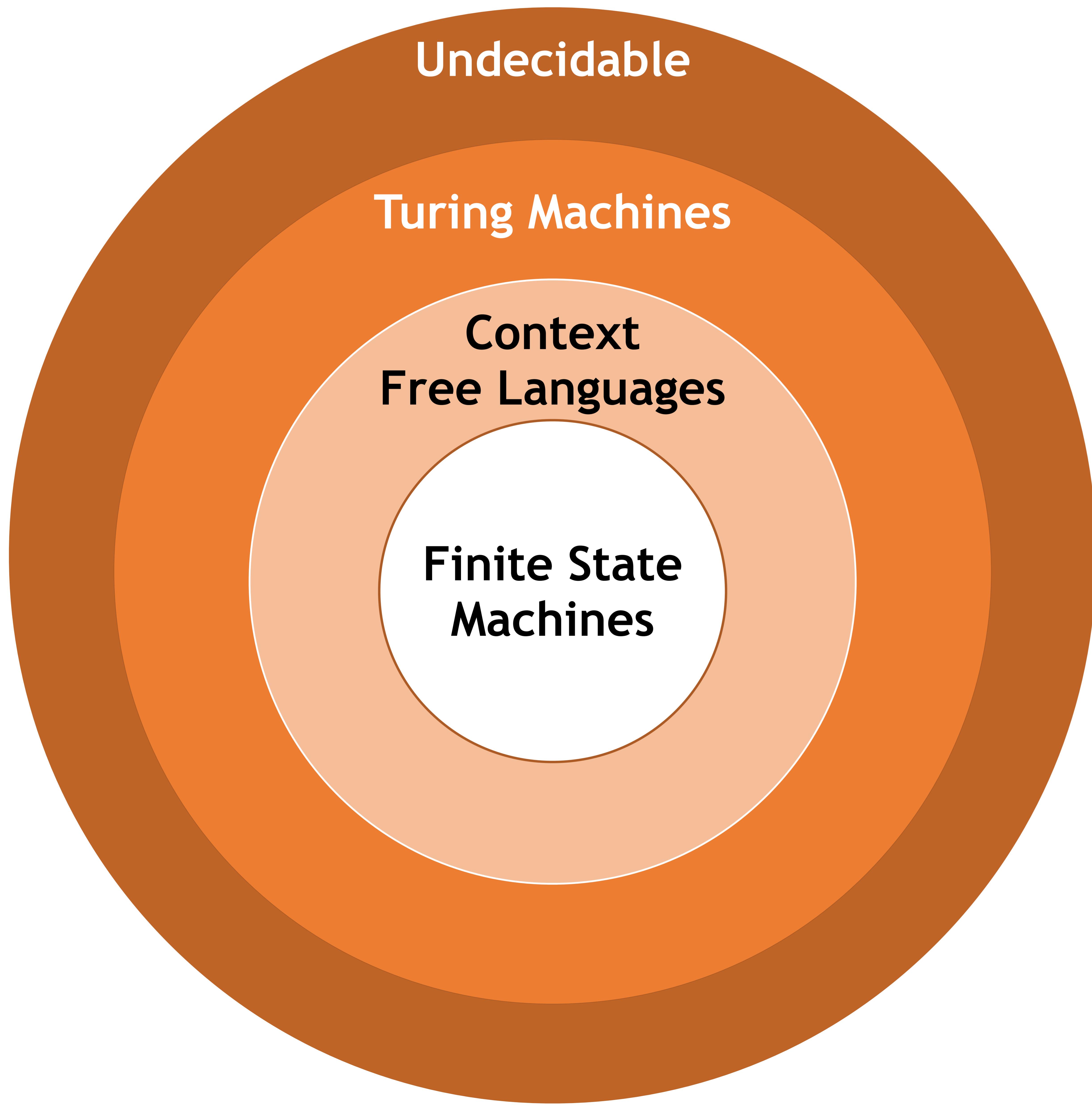


Alan Turing



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Introduction - Course Outline



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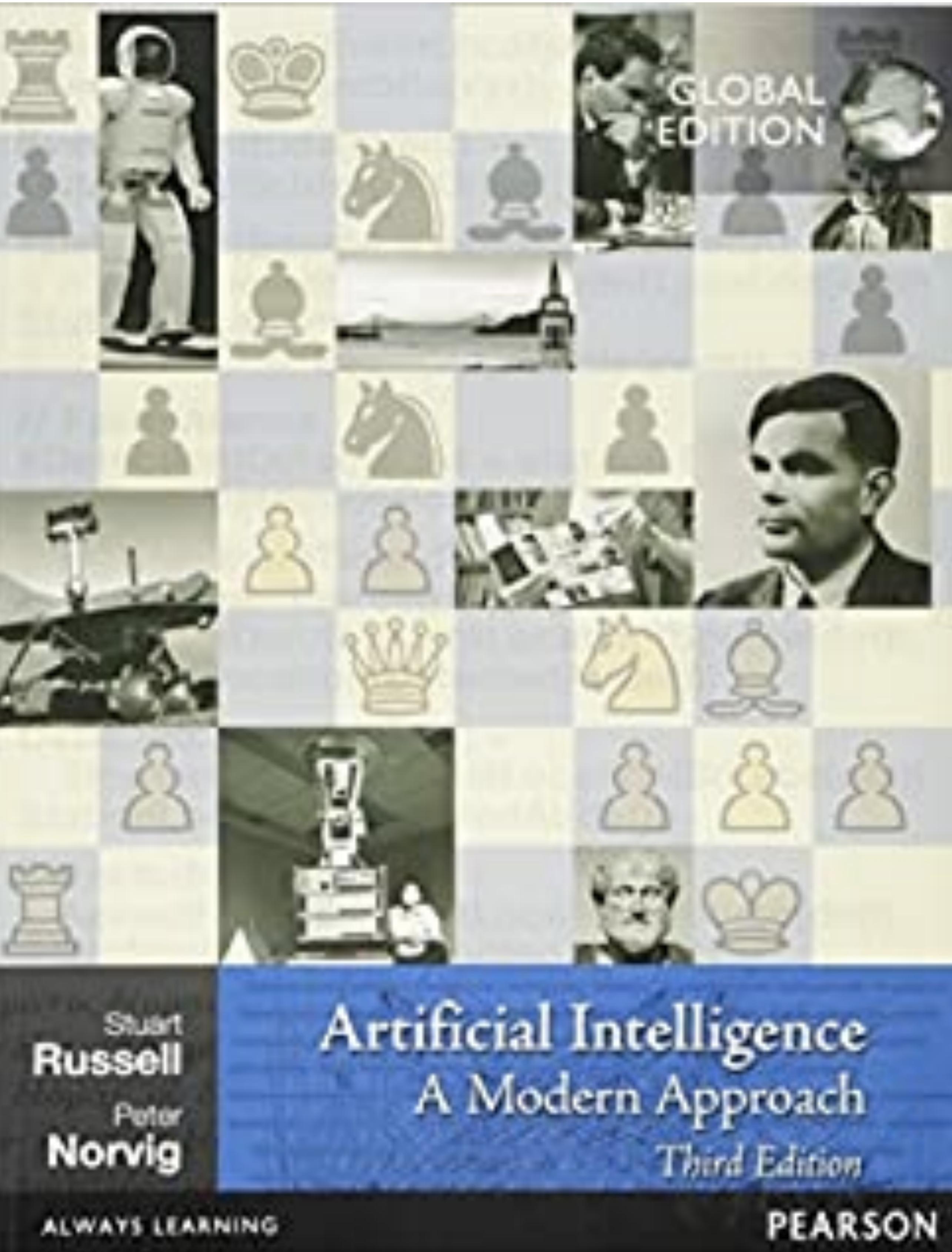
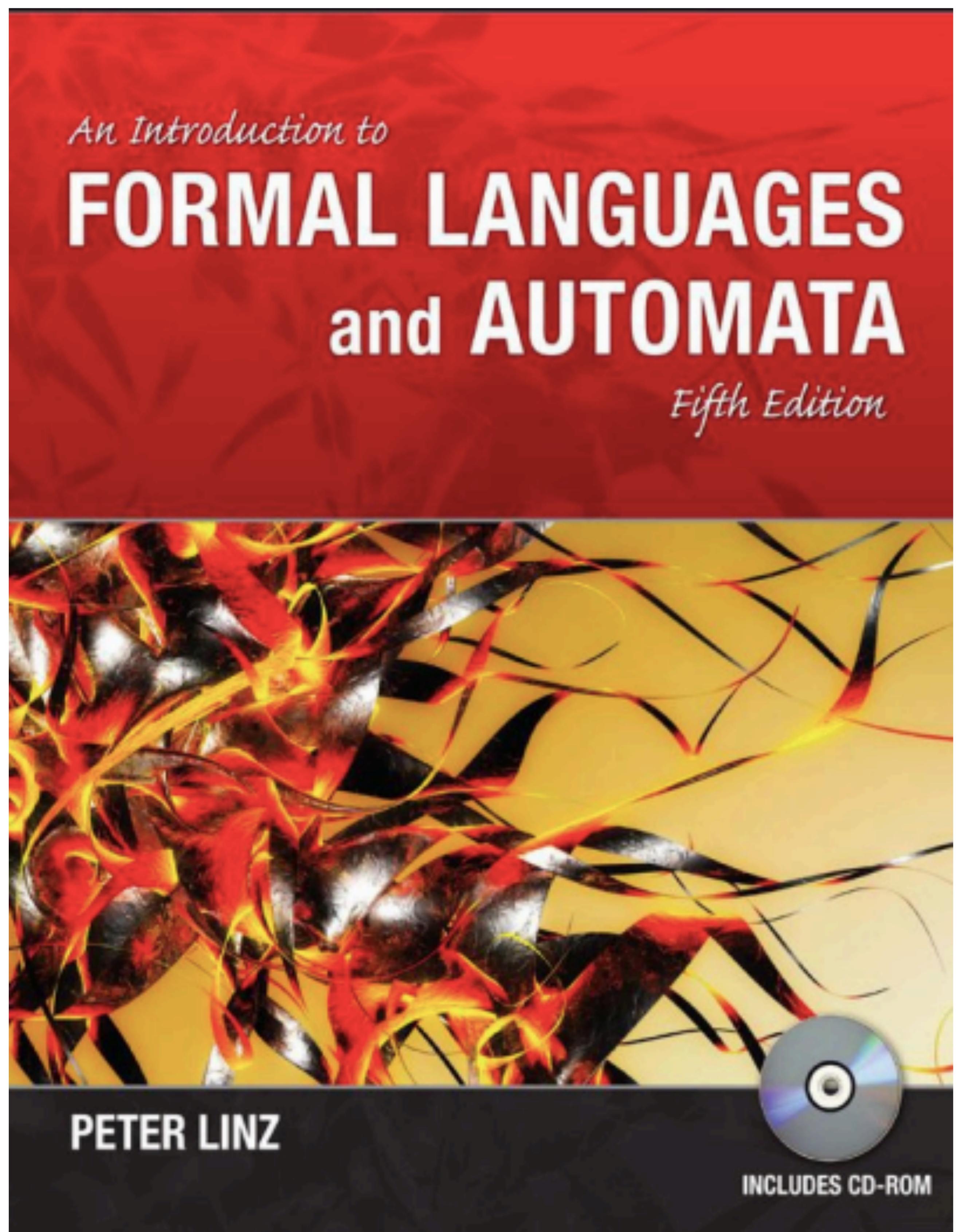
Introduction - Course Objectives

The objectives of this Course is to Study:

- a) Different models of Computations
- b) Limitations on what Computers can do
- c) Different ways of representing a language :
machine(automata), grammar or expression
- d) Basics of Intractability
- e) Connection between theoretical results and practical software

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Introduction - Course Textbook



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Introduction - Course Evaluation Strategy

ISA - (In-Semester Assessment) :

Evaluation Components	Test Type	Test Mode	Conducted for	Scaled down to
ISA	ISA-I	CBT (All MCQs)	40 Marks	15 Marks
	ISA-II	CBT (All MCQs)	40 Marks	15 Marks
	Assignment	3 Class Tests (Pen & Paper) (A1 : Unit 1 & 2, A2 : Unit 3 & 4, A3 : Unit 5)	60 Marks (Each class test conducted for 20 Marks)	10 Marks
ESA	Final	Pen & Paper	100 Marks	60 Marks
Total :				100 Marks



THANK YOU

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