INTRODUCTION TO PROGRAMMING

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Why do we need to know about programming?

Computers are **not smart**

You need to tell a computer **what to do** and **how to do it**

Writing instructions for a computer to follow is known as **programming**

What is programming?

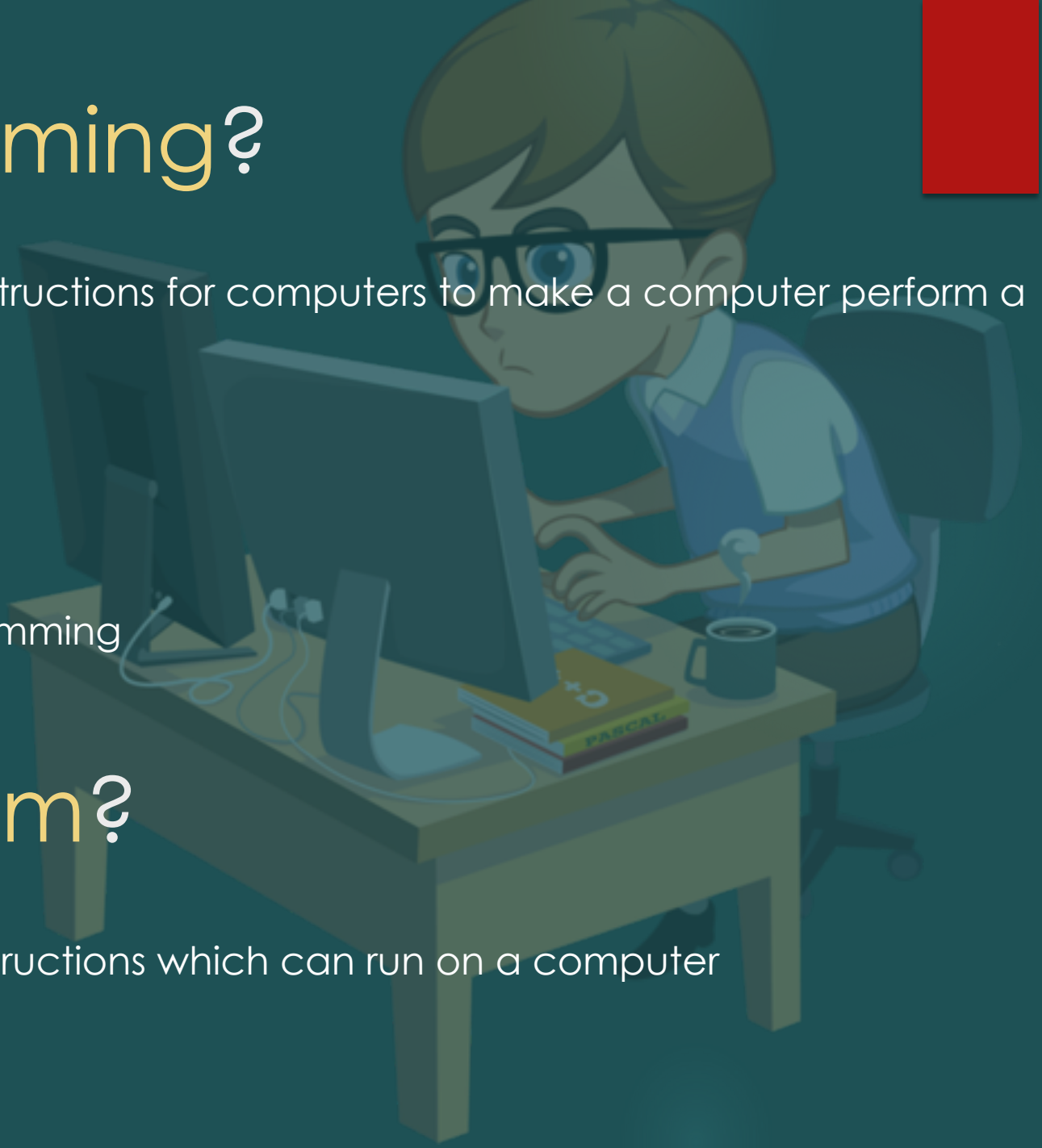
Programming is the act of writing instructions for computers to make a computer perform a task

What is coding?

Coding is another name for programming

What is a program?

A program is a completed set of instructions which can run on a computer



Why is programming important?

We use technology in almost anything we do.

At home

At school

At work

When we study

When we play

When we are sick

Why is programming important?

Technology is an important part of most jobs

Medicine

Law

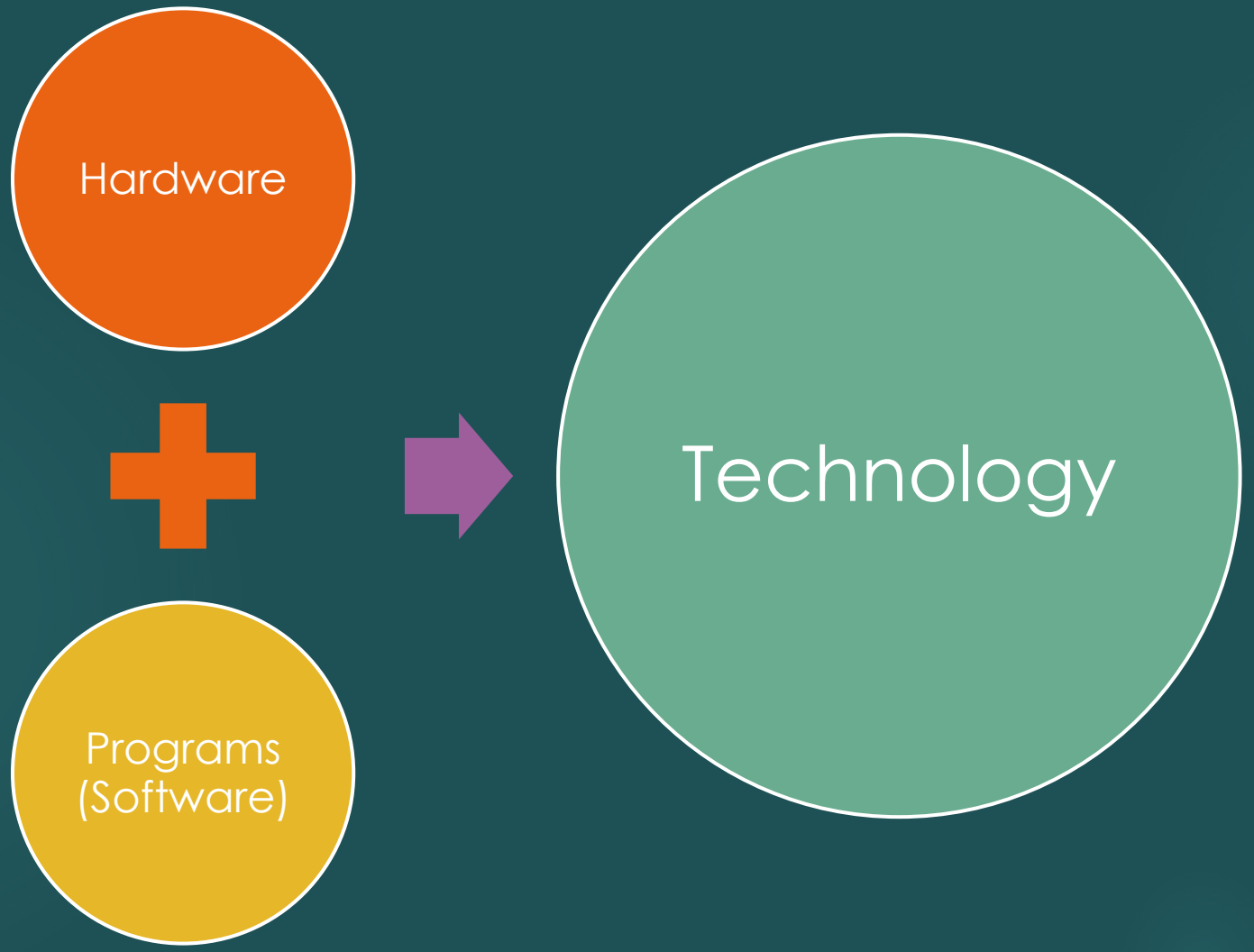
Engineering

Banking

Sales and Marketing

Teaching

Technology



Why is programming important?

You need to **understand** the technology you use to do well at your job

The best way to understand technology is by knowing **how it was built**

Most technology is built using **software**

Software is built using **programs**

Understanding the **basics of programming** allows you to understand technology

Technological familiarity will be an important part of any job of the future

Apple CEO Tim Cook

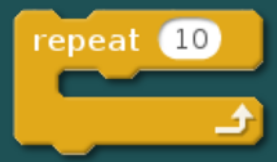
Studying coding could increase your chances of pulling in a big salary, as more than a third of the highest paying jobs in the U.S. right now require some coding knowledge.

Programming is like building LEGO

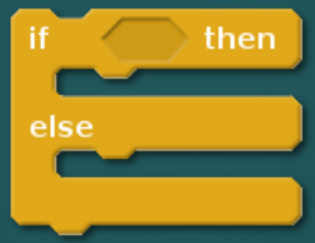
Programming building blocks

Statements

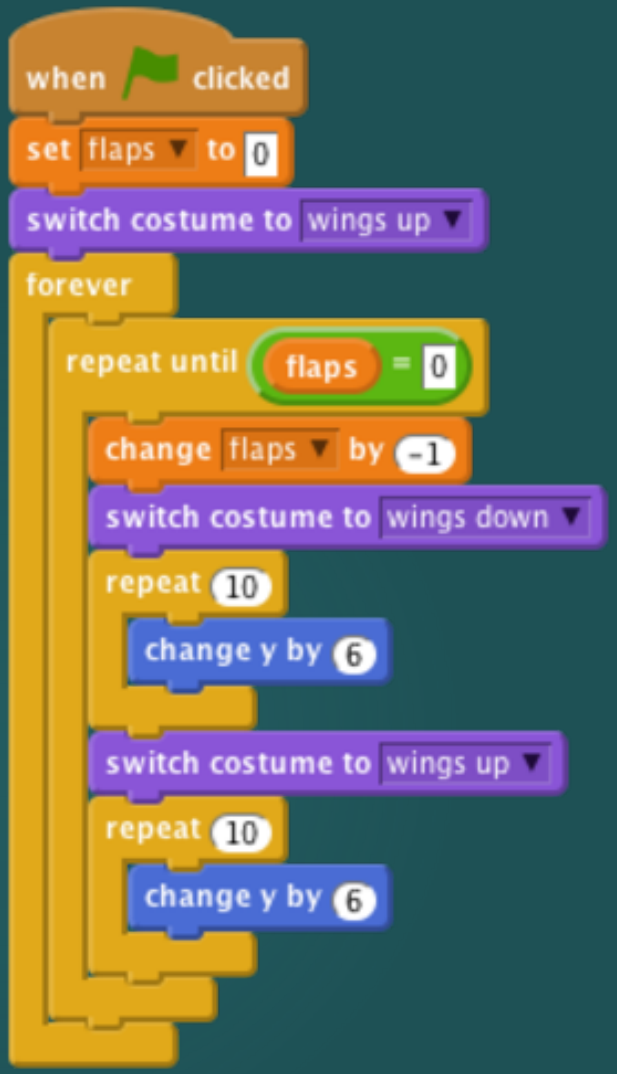
Loops



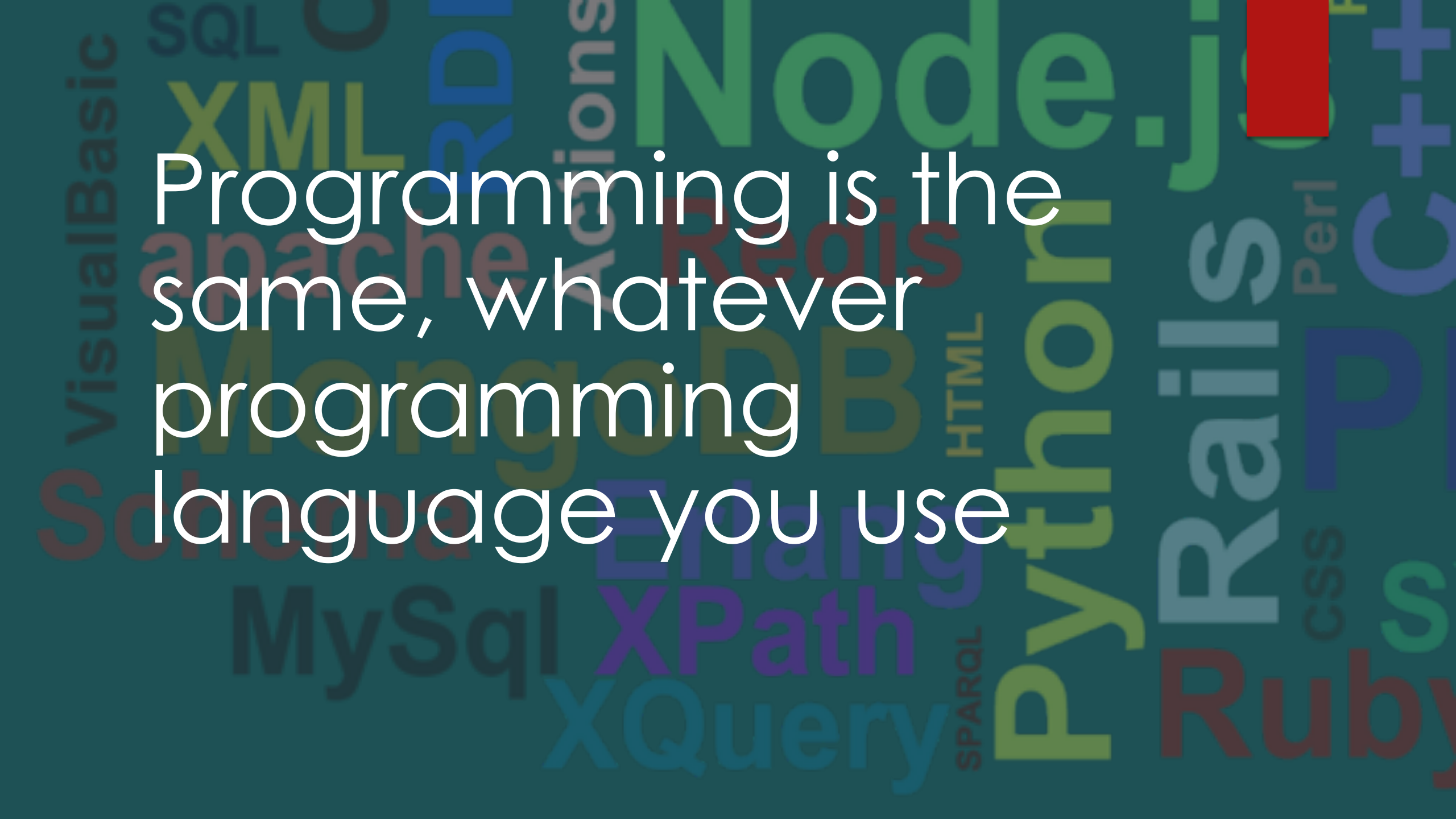
Conditions



A complete program



Programming is simply slotting together the blocks into a sequence to complete a task


Programming is the same, whatever programming language you use

Statements

```
my_car = Car()
print("I'm a car!")
```

Loops

```
while True:
    action = input("What should I do? [A]ccelerate, [B]rake, "
                   "show [O]dometer, or show average [S]peed?").upper()
```

Conditions

```
if self.time != 0:
    return self.odometer / self.time
else:
    pass
```

Statements

```
int i=1, n;

cout << "Enter a number \n";
cin >> n;
```

Loops

```
while( i <= n){

    /* If number is divisible by 2
       then it's an even number
    */
```

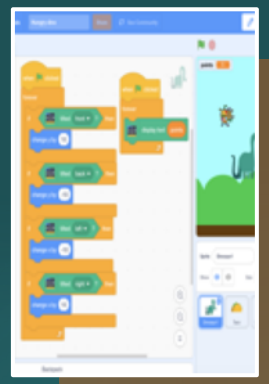
Conditions

```
if(i % 2 == 0){

    cout <<i<< " ";
}
```

So where do I start?

Where do I start?

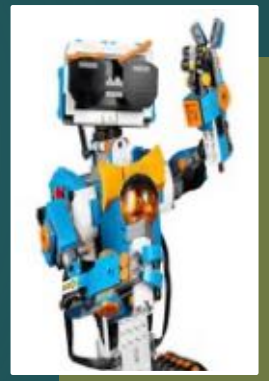


Visual Programming Packages

- Scratch
- Tynker
- code.org
- Code Combat
- Code Monster

Online Courses

- Khan Academy
- Code.org
- Tynker



Programmable Robots

- mBot
- DASH robot
- JIMU
- LEGO BOOST

Lets do some **programming**

scratch

TYNKER™

Jimu robot

BOOST BUILD CODE PLAY

Makeblock

There is another way to write programs

ARTIFICIAL INTELLIGENCE

WHATS THE DIFFERENCE

SOFTWARE

SOFTWARE

TECHNOLOGY

(Hardware + Software)

SOFTWARE

HARDWARE

NORMALLY

Hardware and software built by **humans**

WITH AI

Hardware and software built by other programs and robots

AI Programs can

LEARN

How to do something

They can then

AUTOMATICALLY

WRITE

A program to recreate what they learned

AI CAN LEARN

With a
teacher
or with
supervision

By only telling it
what is
right
and
wrong

Or by learning
on its
own

AI CAN LEARN

From

data

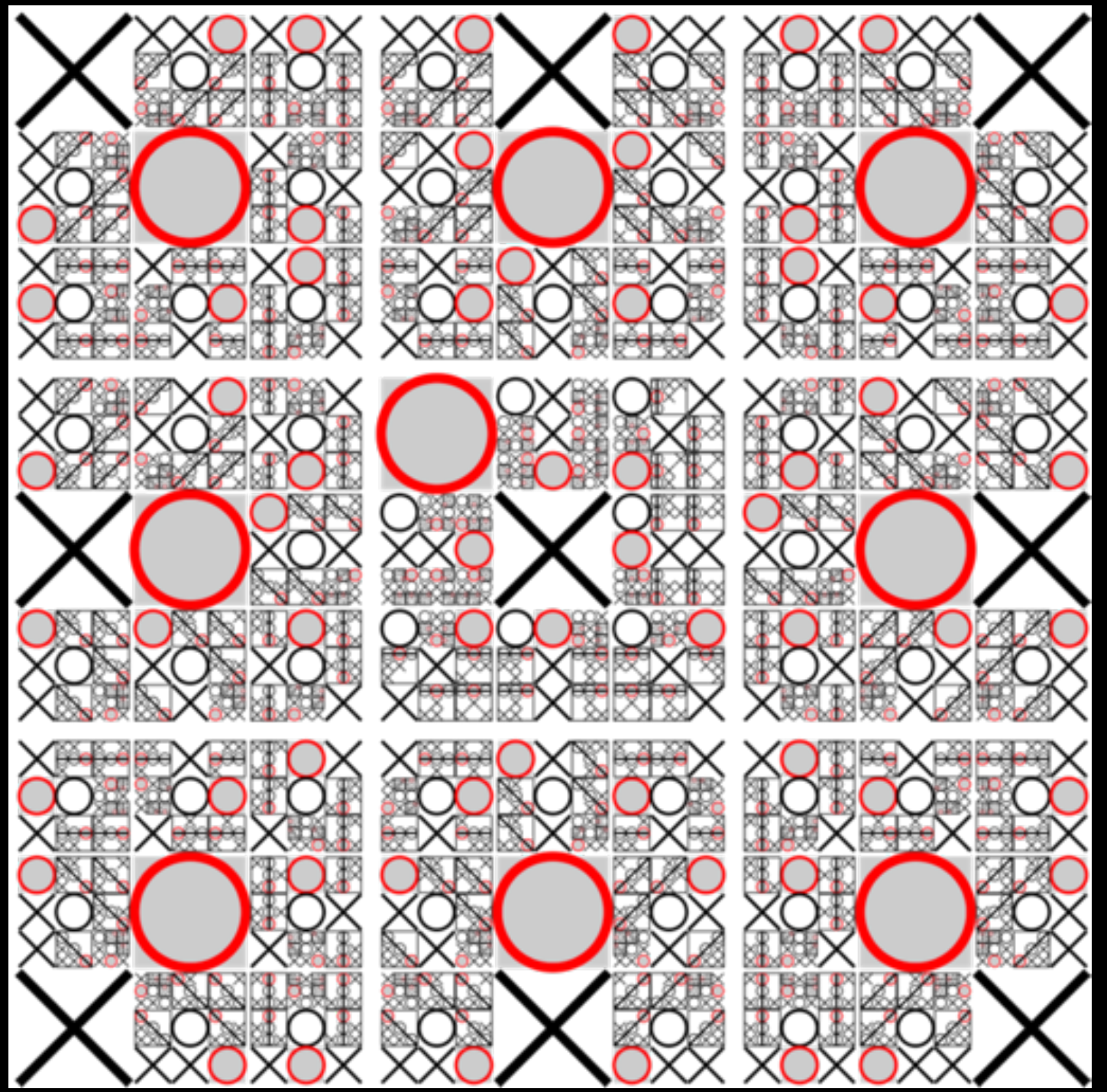
By

Experimenting

WRITING A MACHINE LEARNING COMPUTER PROGRAM TO PLAY TIC TAC TOE

1 LEARN FROM DATA

- SHOW A MACHINE LEARNING ALGORITHM DATA FROM PREVIOUSLY PLAYED TIC TAC TOE GAMES
- ALGORITHM LEARNS TO PLAY TIC TAC TOE FROM THESE EXAMPLES



WRITING A MACHINE LEARNING COMPUTER PROGRAM TO PLAY TIC TAC TOE

2 LEARN FROM EXPERIENCE

- LEARNS BY PLAYING THE GAME
- LOOKING BACK AND ANALYSING WHEN IT WON OR LOST
- CONTINUOUSLY LEARNS FROM EVERY GAME

VS

PLAYING AGAINST HUMAN PLAYERS

VS

PLAYING AGAINST OTHER COMPUTERS

ARTIFICIAL INTELLIGENCE BUILD PROGRAMS WHICH CAN

SEE
LIKE A PERSON

HEAR AND UNDERSTAND
LIKE A PERSON

SPEAK
LIKE A PERSON

DO WHAT
HUMANS
CAN DO

WORK
LIKE A PERSON

THINK
LIKE A PERSON

ARTIFICIAL INTELLIGENCE
IS ALL AROUND US

ARTIFICIAL INTELLIGENCE
IS ALL AROUND US

AIR TICKET PRICES

BANK LOANS

HOTEL PRICES

ARTIFICIAL INTELLIGENCE
IS ALL AROUND US

WEATHER PREDICTION

STOCK MARKET

ONLINE SHOPPING

MOST AI WORKS

BEHIND THE SCENES

YOU

DON'T SEE IT

AFFECTS

ALL OUR LIVES

ARTIFICIAL INTELLIGENCE HAS CHANGED AND IS CHANGING

MEDICINE

ENGINEERING

LAW

BANKING

SALES

EDUCATION

SECURITY

MANAGEMENT

ALL JOBS AS WE KNOW IT

WILL CHANGE

ARTIFICIAL INTELLIGENCE

JOBS

AI SCIENTIST

DEVELOPS NEW TYPES OF AI

AI ENGINEER

BUILD NEW AI APPLICATIONS

ALL OTHER JOBS

WILL USE SOME AI IN THEIR JOBS

BE AWARE

OF HOW TECHNOLOGY IS CHANGING JOBS AND INDUSTRIES

People wont lose their jobs to a computer

But they could lose their jobs to someone who knows how to use a computer better