

INTRODUCTION TO PROGRAMMING

WHAT IS PROGRAMMING?

Writing human "readable" text that is transformed into a series of commands a computer can understand

What kind of tasks would make good a candidate for a program?

- Repeatable tasks
- Manual tasks with risks of human error
- Pulling together lots of data from a wide range of sources


What kind of tasks would not make a good candidate for a program?

- Making decisions
- Applying context to a situation
- Recognising images
- All of these are changing as innovations in machine learning are being made

WHO IS THIS?



THIS IS WHAT GOOGLE VISION THOUGHT

 Google Cloud Platform

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Faces

Labels

Web

Properties

Safe Search



694606.jpg

Blue	97%
Facial Expression	93%
Fashion Accessory	90%
Smile	85%
Headgear	83%
Headpiece	75%
Fun	73%
Hat	70%

WHAT IS THE 200TH DIGIT OF PI ?

```
Command Prompt
Digit 175: 1
Digit 176: 0
Digit 177: 5
Digit 178: 5
Digit 179: 5
Digit 180: 9
Digit 181: 6
Digit 182: 4
Digit 183: 4
Digit 184: 6
Digit 185: 2
Digit 186: 2
Digit 187: 9
Digit 188: 4
Digit 189: 8
Digit 190: 9
Digit 191: 5
Digit 192: 4
Digit 193: 9
Digit 194: 3
Digit 195: 0
Digit 196: 3
Digit 197: 8
Digit 198: 1
Digit 199: 9
Digit 200: 6
314159265358979323846264338327950288419716939937510582097494459230781640628620899862803482534211706798214808651328230664
709384460955058223172535940812848111745028410270193852110555964462294895493038196
c:\development\pi-searcher>
```

WHAT IS PROGRAMMING? (UPDATED)

"Humans and computers using their strengths together to accomplish tasks"

Computers are very literal

Windows

A fatal exception 0E has occurred at 0028:C562F1B7 in VXD ctpci9x(05)
+ 00001853. The current application will be terminated.

- * Press any key to terminate the current application.
- * Press CTRL+ALT+DEL again to restart your computer. You will lose any unsaved information in all applications.

Press any key to continue _

UNDERSTANDING PSEUDOCODE

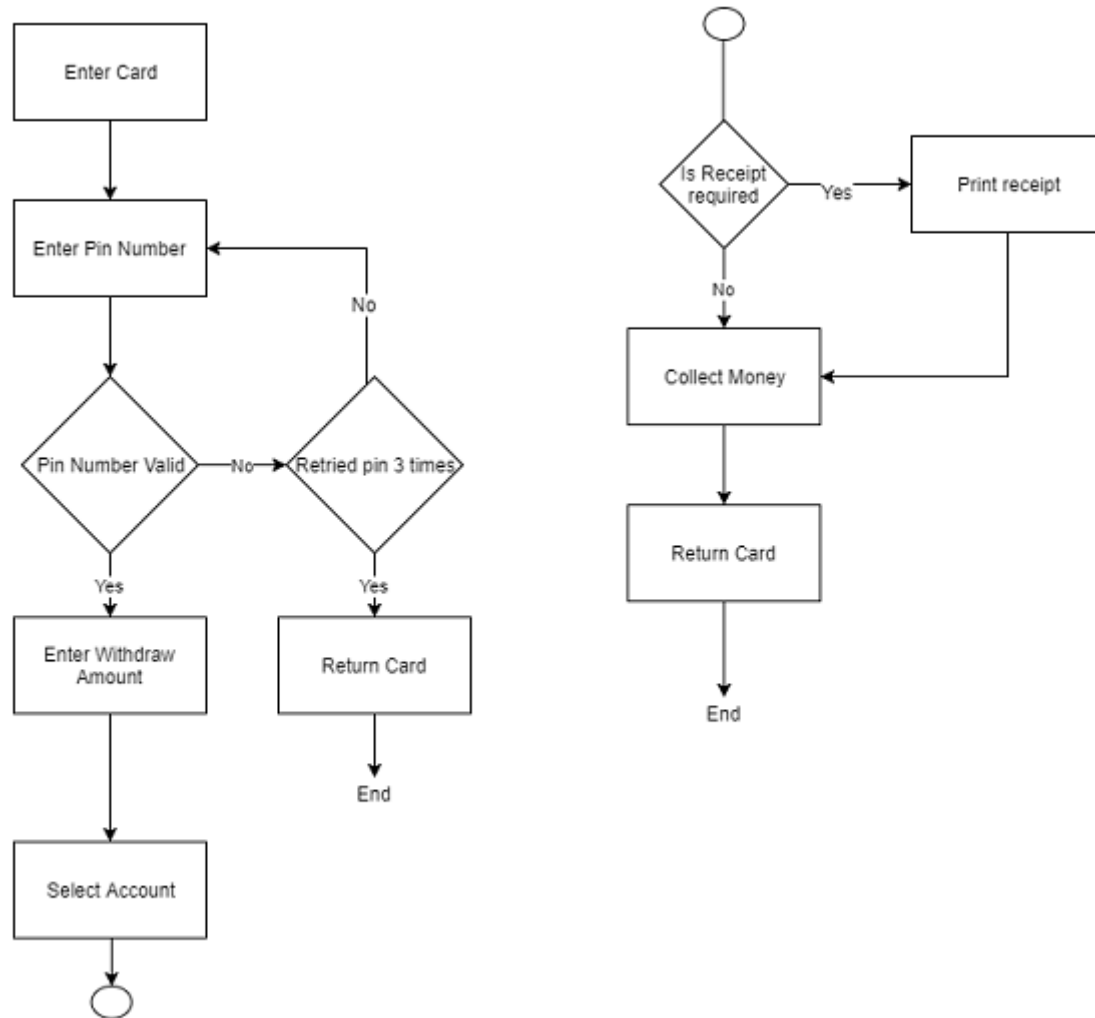
- Planning technique to write out a programs logic
- Language agnostic
- Great tool for collaborating

PSEUDOCODE TECHNIQUES

A simple list

1. Boil water in kettle
2. Put tea bag in cup
3. Wait for water to boil
4. Add boiled water to cup
5. Add sugar
6. Add milk
7. Serve

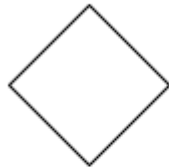
Flow Chart



Flow Chart Key



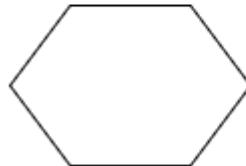
An action performed by the program



A decision required to progress through the program



Connector symbol to show continuation of flow chart between pages



Indicated a loop process is occurring

End

Symbolises the program has reached the end of its function and can terminate

Pseudocode

```
PROGRAM PrintSumOf1To5
    Total = 0;
    A = 1;
    WHILE (A <= 5)
        DO    Total = Total + A;
            A = A + 1;
        ENDWHILE
    Print Total;
END
```

PSEUDOCODE EXERCISE

In pairs, choose one of the pseudocode methods we have discussed to detail the steps in going through the checkout of a grocery store.

VARIABLES

- A value that is stored and accessible from within an application
- Every variable is given a name, which can be used to reference the value throughout a program

VARIABLE TYPES

Name	Example	Description
String	"Hey there!"	A series of characters surrounded by quotation marks
Number	26	Any number between -2^{53} and 2^{53}
Boolean	True/False	A computer science concept of a value that either be true or false
Array	["Hello", 2, true]	An ordered collection of data, can either be a primitive or an object

ASSIGNING VARIABLES

```
var string = "hello there!";  
var number = 26;  
var boolean = true;  
var array = ["hello there!", 26, true];
```

VARIABLE EXERCISE

Fill out t