

Master Class

Data structures, algorithms, philosophy
and sarcasm

Data what?

- A variable is a simple data structure!

```
var x = 2.0;
```

- An array is a series of variables:

```
var a = [1, 2, 3];
```


More data structures

- Lists, Structs, Sets, Maps, Trees, Queues, Stacks, Graphs.....
- It is a deep subject!
- Today, we play with Lists and arrays

Algorithms

- Any computation is an algorithm
- Simple example: Find the minimum!
var a = [10, 9, 8, 7, 9, 16, -1];
var b = min(a);
- Memory and speed are important!

Philosophy

"A person does not really understand something until after teaching it to a computer, i.e., express it as an algorithm."

- Donald Knuth

Sarcasm

If debugging is the process of removing software bugs, then programming must be the process of putting them in."

- Edsger Dijkstra

Task 1

- Allocate your team 5 cups that are consecutively numbered
- Put a different coloured smartie in each cup
- The row of cups is now an array
- How many steps does it take to get the 3rd smartie?

Task 2: Linked Lists

- Put a smartie into any cup. flintymashedmouse
- Now take any other cup. Put the stick with the 2nd cup's number into the first cup. Put a smartie into the 2nd cup.
- Now grab a third cup. Put stick with that cup number on it into the 2nd cup. Put a smartie into the 3rd cup.
- Repeat until all cups have been used.
- Now what colour is the smartie in the 3rd cup in the chain? You have to start from the first cup.
- How many steps did that take?
- Now eat the smarties!

Next week

- Code with arrays
- Build simple linked list
- Look more at applications of linked lists