



01 Sep 2019

Starlink.

Battle for Atlas



The challenge

This set of tutorials will teach you how to program a star ship!

You will learn how to:

- ✓ Recognise and use different programming constructs
- ✓ Add sprites
- ✓ Program your ship
- ✓ Make your ship interact with other sprites





What is Starlink?

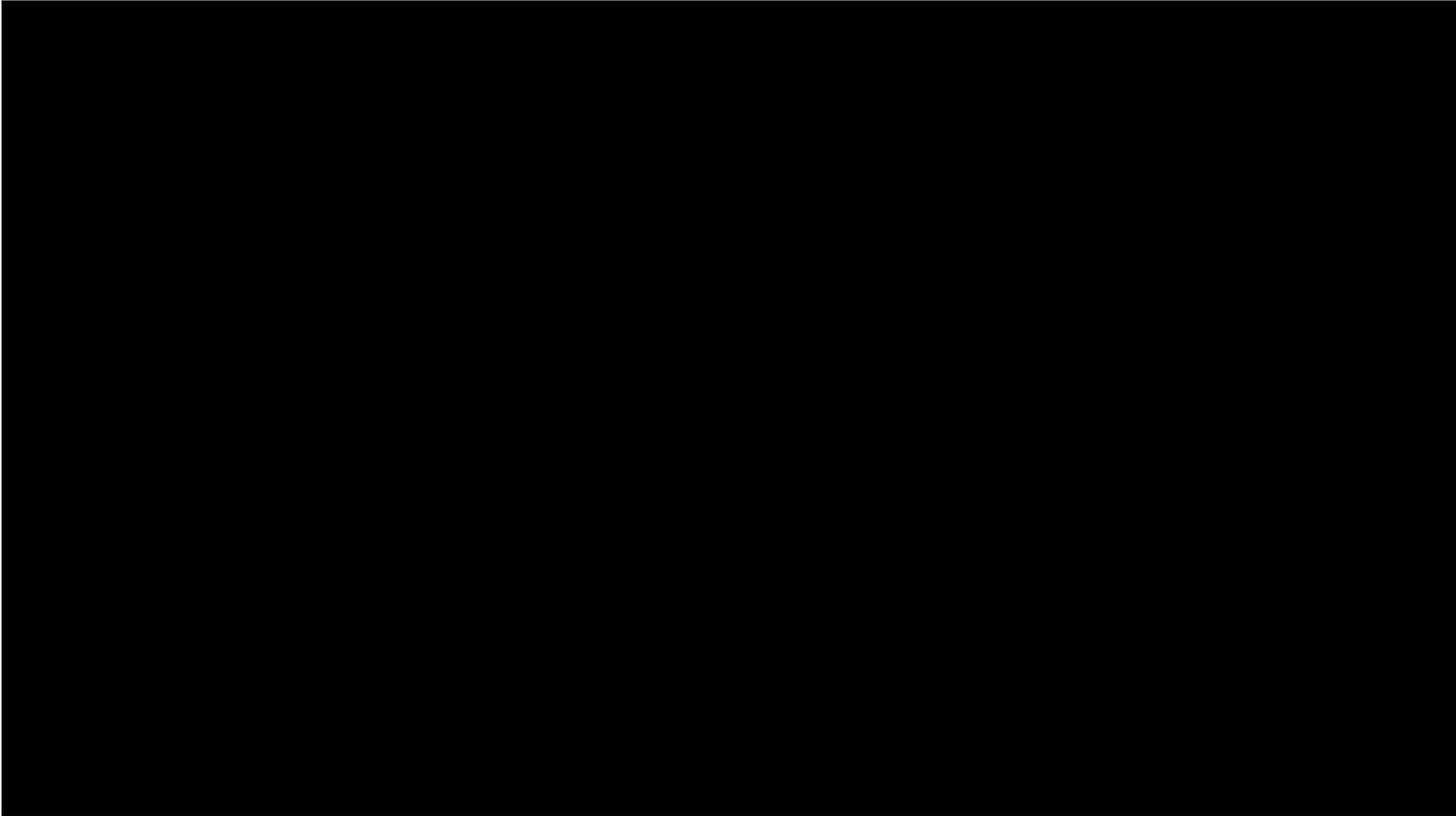




What does Starlink have to do with Computer Science?



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We are going to focus on number 1: Understanding how the machinery works!

```
# *****
# GENERAL PURPOSE IGNITION ROUTINES
# *****
```

```
BURNBABY      TC      PHASCHNG      # GROUP 4 RESTARTS HERE
               OCT      04024

               CAF      ZERO              # EXTIRPATE JUNK LEFT IN DVTOTAL
               TS      DVTOTAL
               TS      DVTOTAL +1

               TC      BANKCALL      # P40AUTO MUST BE BANKCALLED EVEN FROM ITS
               CADR     P40AUTO      # OWN BANK TO SET UP RETURN PROPERLY

B*RNB*B*      EXTEND

               DCA      TIG          # STORE NOMINAL TIG FOR OBLATENESS COMP.
               DXCH     GOBLTIME     # AND FOR P70 OR P71.

               INHINT

               TC      IBNKCALL
               CADR     ENGINOF3
               RELINT
```

Programming theory

To be able to understand how machinery works you also need to understand how the programming of the machine works and that is exactly what this workshop is all about!

The picture on the left is some of the code that took man to the moon in the Apollo 11 mission!



Sequence
Sequence
Sequence
Sequence

Selection

Iteration!

Programming theory

There are three main constructs that we use when programming

A construct is a fancy way of describing the different types of programming

The three constructs are:

- Sequence
- Selection
- Iteration



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Programming theory

Sequence
Sequence
Sequence
Sequence

Sequence is the name given
to instructions that are run in
the order they are written



One snowy day

in the Bahamas

President Bush met

Madonna

HE SAID, 'DO YOU LIKE ME?'

She said, 'Twenty miles away.'

The Consequence was they bought a second-hand car

and a wind blew their roof off.

Programming theory - Sequence

Play a game of consequences



One snowy day

in the Bahamas

President Bush met

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HE SAID, 'DO YOU LIKE ME?'

She said, 'Twenty miles away.'

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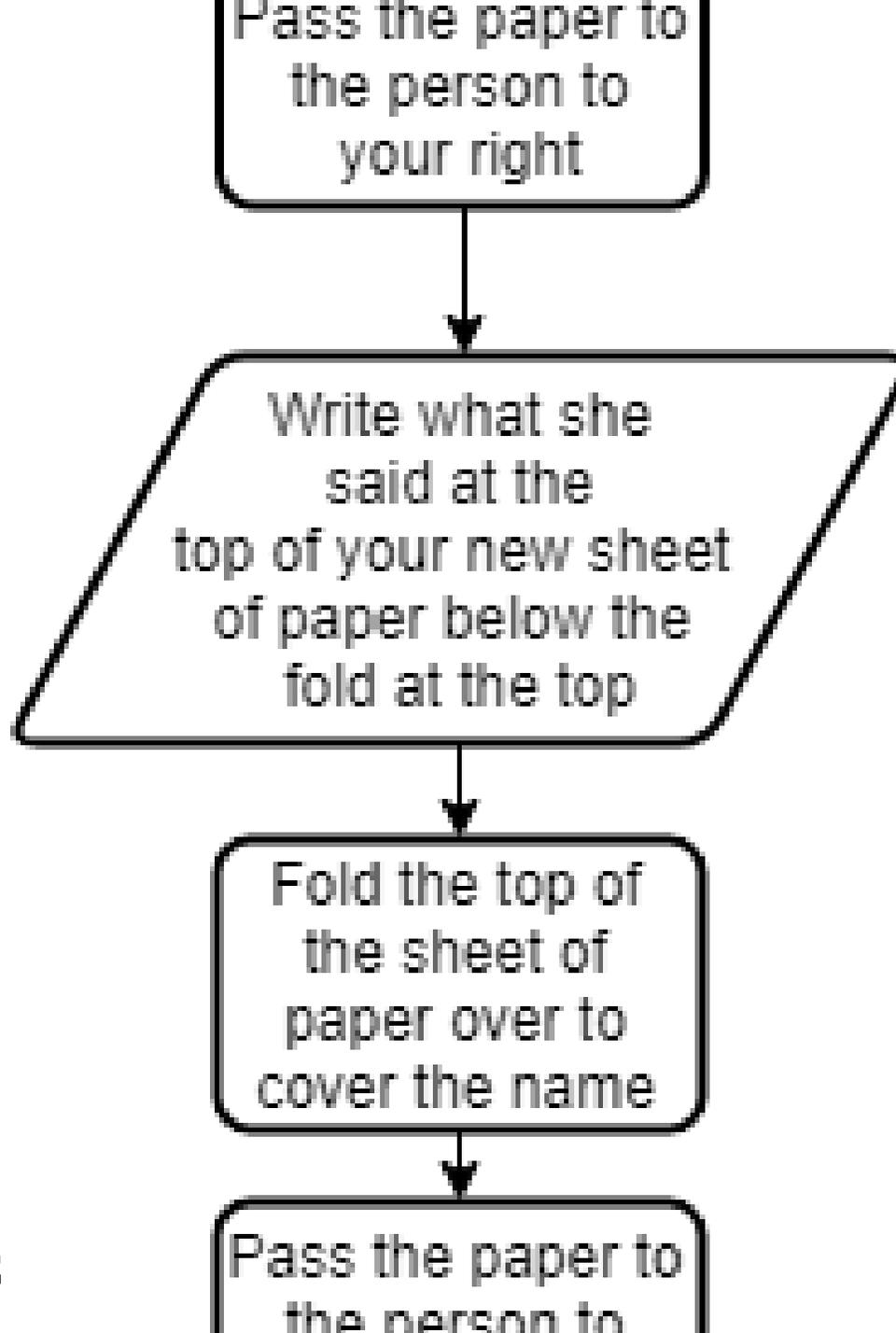
and a wind blew their roof off.

Programming theory - Sequence

Just like you followed the instructions and then read the story in the order it was written, computers will run a program in the order it is written if it only uses sequence



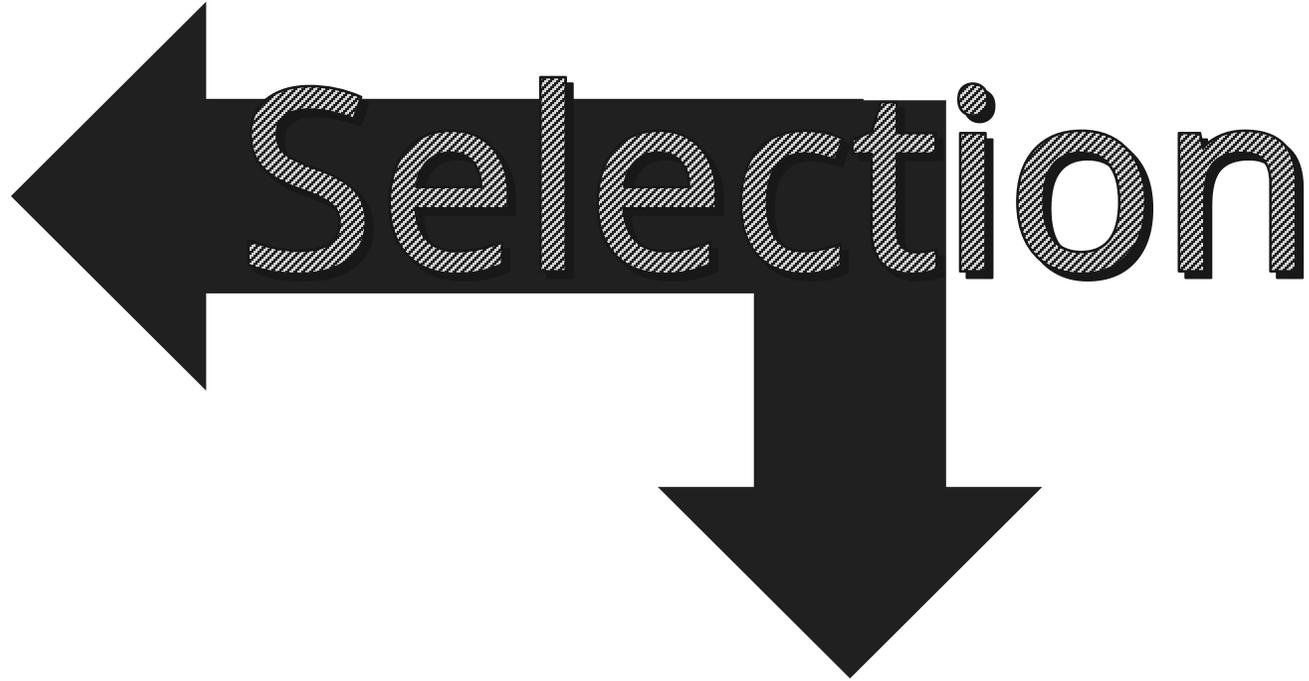
Programming theory - Sequence



Lets have a look at what that would look like as a flowchart

Pretty long!

Programming theory



Selection is the name given to sets of instructions that are run as the result of a condition



Programming theory



Play a game of Simon Says!



Programming theory



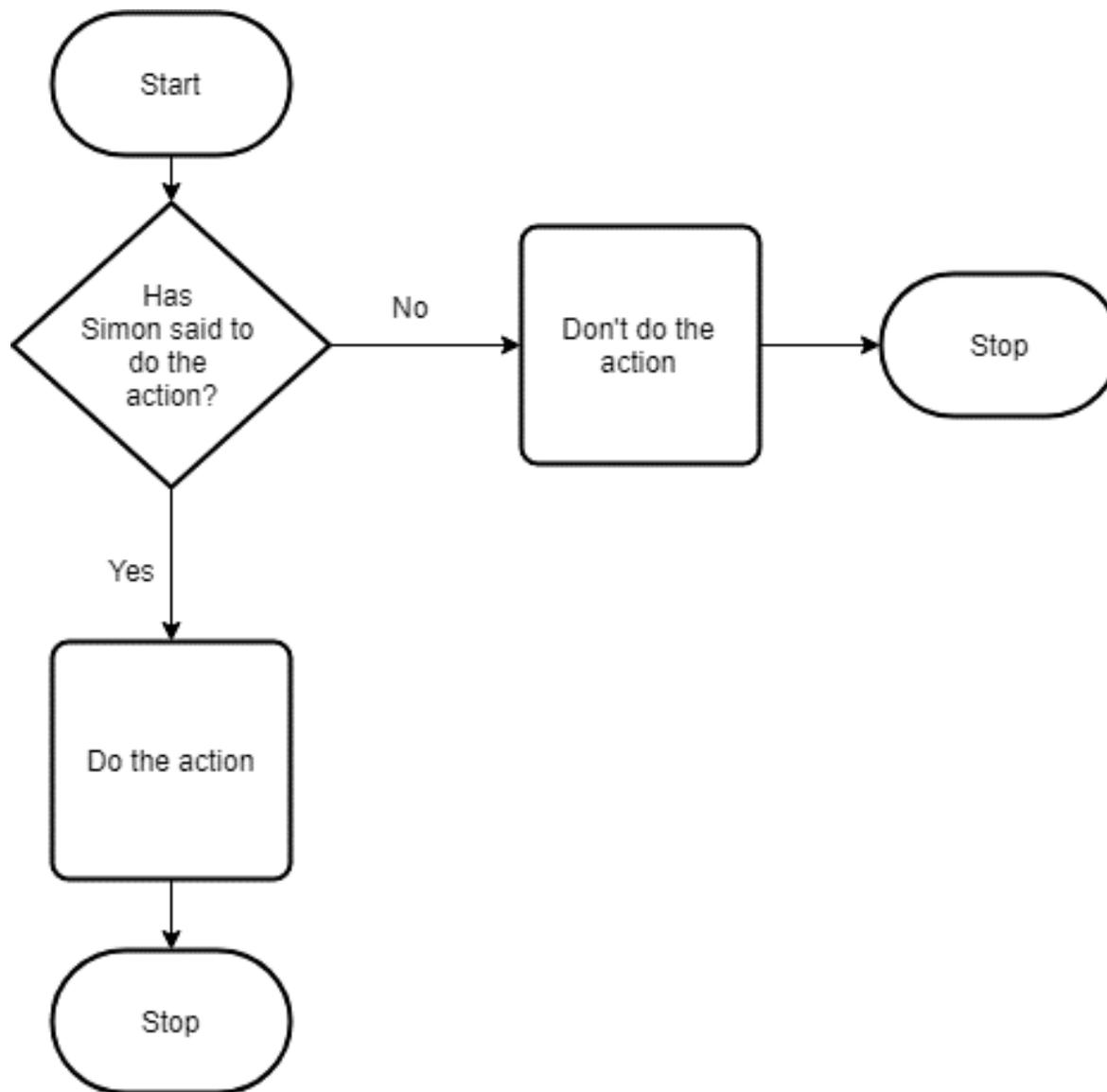
Simon Says! uses selection as you only do the action if Simon Says!



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Programming theory



Lets have a look at what that would look like as a flowchart

Pretty straight forward!

Programming theory

Iteration!

Iteration is the name given to sets of instructions that are repeated a set number of times or until a condition is met



Programming theory



Play a game of hide and seek



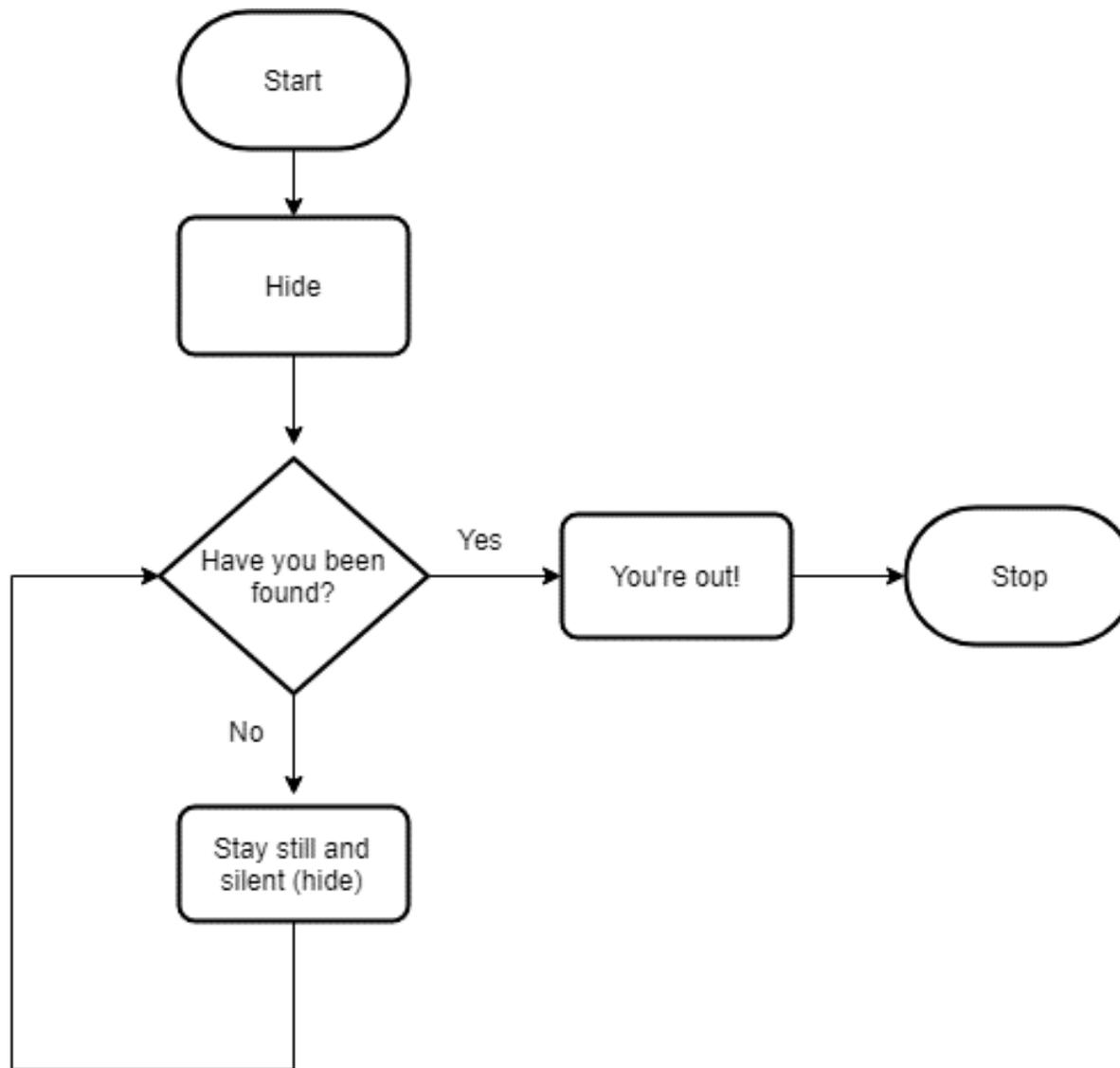
Programming theory



Hide an seek is an example of a game that uses iteration – you hide until you are found



Programming theory



Lets have a look at what that would look like as a flowchart

Pretty straight forward!

Sequence
Sequence
Sequence
Sequence

Programming
theory

Selection

Iteration!

You can use the different
constructs together in the
same code



Programming theory



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Play a game of pass the parcel

Programming theory

Pass the parcel uses iteration as the parcel is passed until the music stops

It uses sequence:

- You remove a layer from the parcel

It also uses selection:

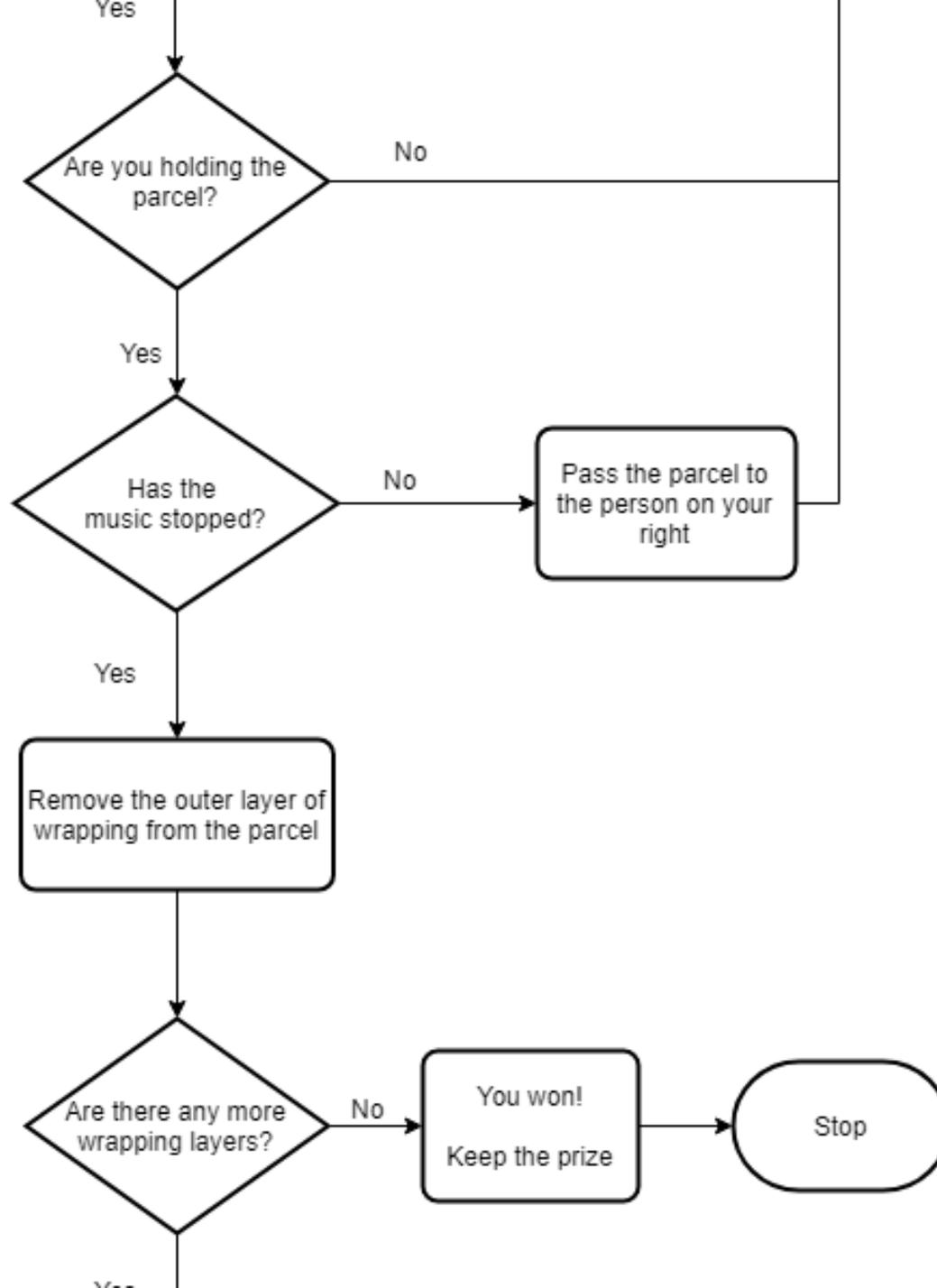
- If you find a sweet under the layer you eat it
- If you find a dare you do that



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Programming theory



Lets have a look at what that would look like as a flowchart

Quite complicated!



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Programming theory



Play a game of 'The chocolate game'

Programming theory

'The chocolate game' uses nesting

The dice is passed on until a 6 is rolled (the outer loop) Once a 6 is rolled an inner loop is run until another 6 is rolled:

Put on a hat

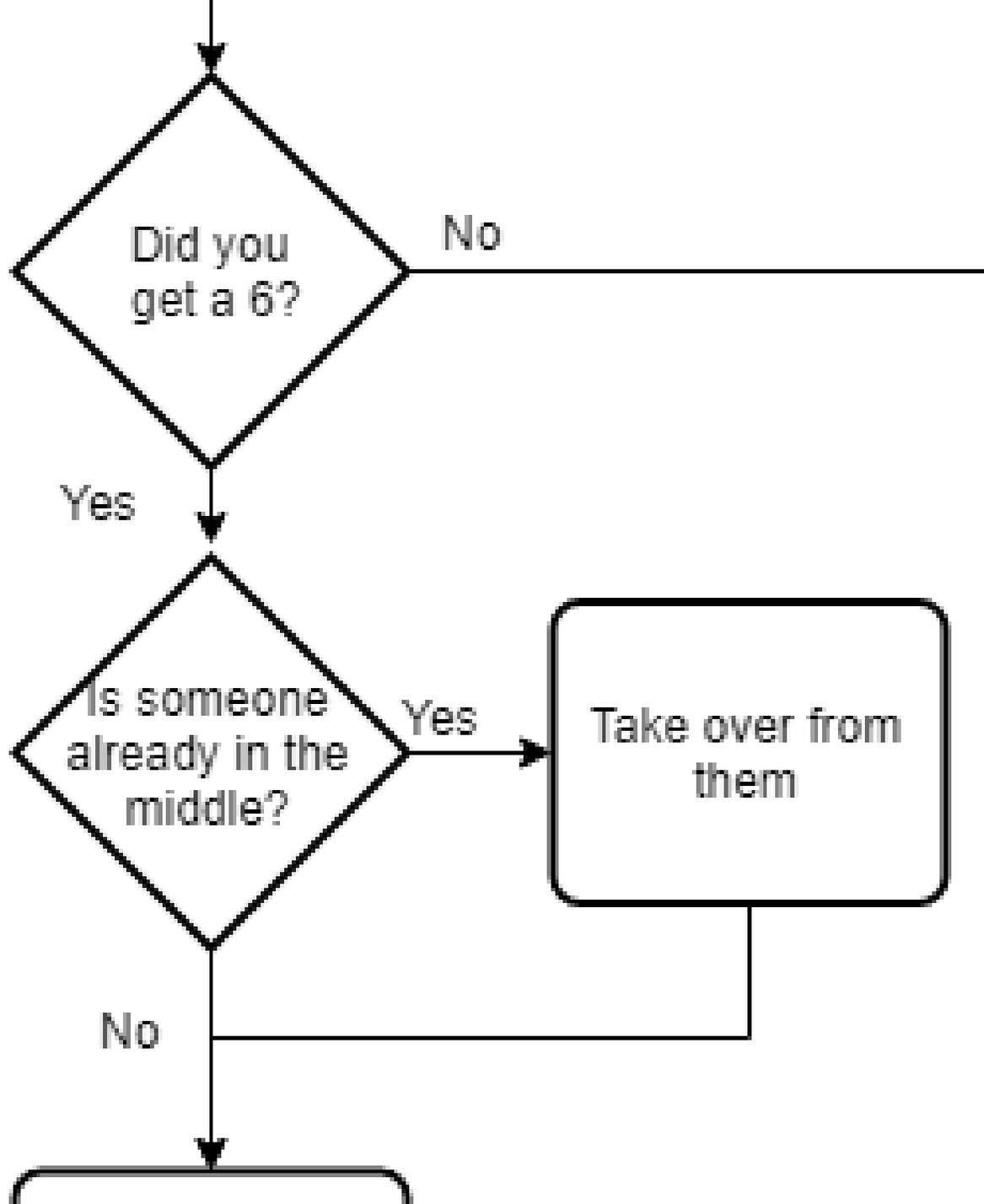
Put on the gloves

Put on the scarf

Eat the chocolate with the knife and fork



Programming theory



Lets have a look at what that would look like as a flowchart

Quite complicated!





Now you know about the programming constructs, lets use them to program a star ship!