
CHAPTER 1

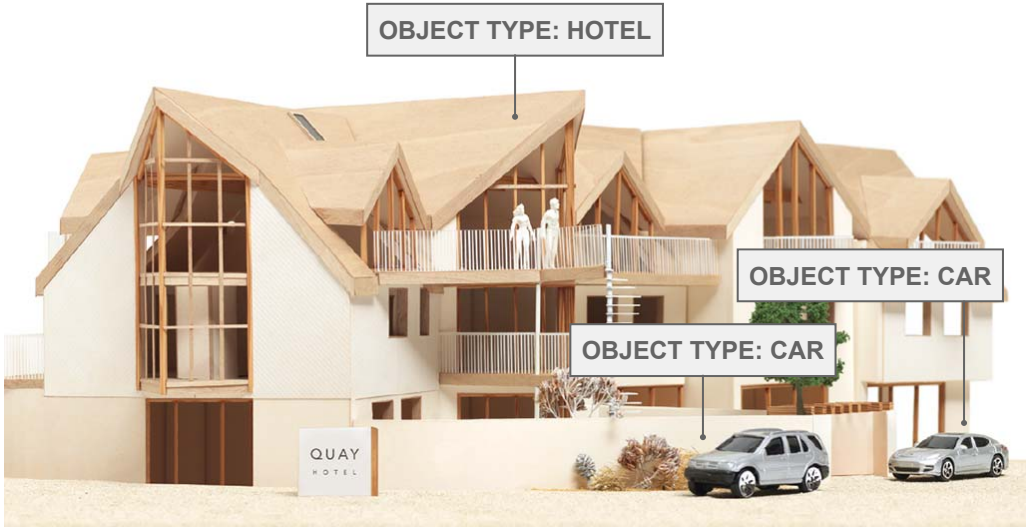
# THE ABC OF PROGRAMMING

B

## HOW DO COMPUTERS FIT IN WITH THE WORLD AROUND THEM?

Here is a model of a hotel, along with some trees, people, and cars.


To a human, it is clear what kind of real-world object each one represents.



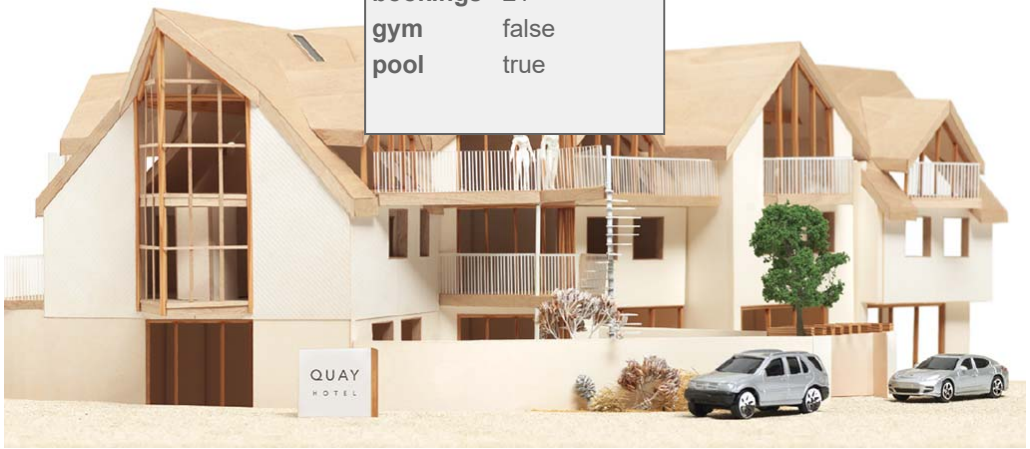

Computers create models of the world using **data**.

The objects in these models use **properties**, **events**, and **methods**.

# PROPERTIES

Properties tell the computer about the **characteristics** of an object.

| OBJECT TYPE: HOTEL | |
|---|---|
| **PROPERTIES** | |
| **name** | Quay |
| **rating** | 4 |
| **rooms** | 42 |
| **bookings** | 21 |
| **gym** | false |
| **pool** | true |




# EVENTS

Events tell the computer how the user can **interact** with an object.

| OBJECT TYPE: HOTEL | |
|---|---|
| **EVENT** | **happens when:** |
| **book** | reservation is made |
| **cancel** | reservation is cancelled |


# METHODS

Methods tell the computer how to **change** the properties of an object.

| OBJECT TYPE: HOTEL | |
|---|---|
| **METHOD** | **what it does:** |
| **makeBooking()** | increases value of **bookings** |
| **PROPERTY** | |
| **cancelBooking()** | decreases value of **bookings** property |
| **checkAvailability()** | subtracts value of **bookings** property from value of **rooms** property and returns number of rooms available |


Here is the data the computer might use to make a model of one of the cars.

| OBJECT TYPE: CAR | | |
|---|---|---|
| **EVENT** | **happens when:** | **method called:** |
| **brake** | driver slows down | changeSpeed() |
| **accelerate** | driver speeds up | changeSpeed() |

| **METHOD** | **what it does:** |
|---|---|
| **changeSpeed()** | increases or decreases value of **currentSpeed** property |

| **PROPERTIES** | |
|---|---|
| **make** | BMW |
| **currentSpeed** | 45mph |
| **color** | silver |
| **fuel** | diesel |


OBJECT TYPE: CAR

EVENT happens when: method called:
brake driver slows down changeSpeed()
accelerate driver speeds up changeSpeed()

METHOD what it does:
changeSpeed() increases or decreases value of currentSpeed property

PROPERTIES
make BMW
currentSpeed 45mph
color silver
fuel diesel

| OBJECT TYPE: CAR | | | | |
|---|---|---|---|---|
| EVENT | happens when: | method called: | PROPERTIES | |
| brake | driver slows down | changeSpeed() | make | BMW |
| accelerate | driver speeds up | changeSpeed() | currentSpeed | 45mph |
| METHOD | what it does: | | color | silver |
| changeSpeed() | increases or decreases value of **currentSpeed** property | | fuel | diesel |


| OBJECT TYPE: CAR | | | | |
|---|---|---|---|---|
| EVENT | happens when: | method called: | PROPERTIES | |
| brake | driver slows down | changeSpeed() | make | BMW |
| accelerate | driver speeds up | changeSpeed() | currentSpeed | 45mph |
| METHOD | what it does: | | color | silver |
| changeSpeed() | increases or decreases value of **currentSpeed** property | | fuel | diesel |


| OBJECT TYPE: CAR | | | | |
|---|---|---|---|---|
| EVENT | happens when: | method called: | PROPERTIES | |
| brake | driver slows down | changeSpeed() | make | BMW |
| accelerate | driver speeds up | changeSpeed() | currentSpeed | 30mph |
| METHOD | what it does: | | color | silver |
| changeSpeed() | increases or decreases value of **currentSpeed** property | | fuel | diesel |


# WEB BROWSERS

Web browsers use models of the browser window and the web pages contained in them.


Web browsers use these models to understand how to interpret web pages.

1

1

The browser receives a web page

```
<DOCTYPE html>
<html>
  <head>
    <title>Constructive &amp;amp; Co</title>
    <link rel="stylesheet" href="c01.css" />
  </head>
  <body>
    <h1>Constructive &amp;amp; Co</h1>
    <p>For all orders and enquiries,
    please call <em>555-3344</em></p>
  </body>
</html>
```

1

The browser receives a web page

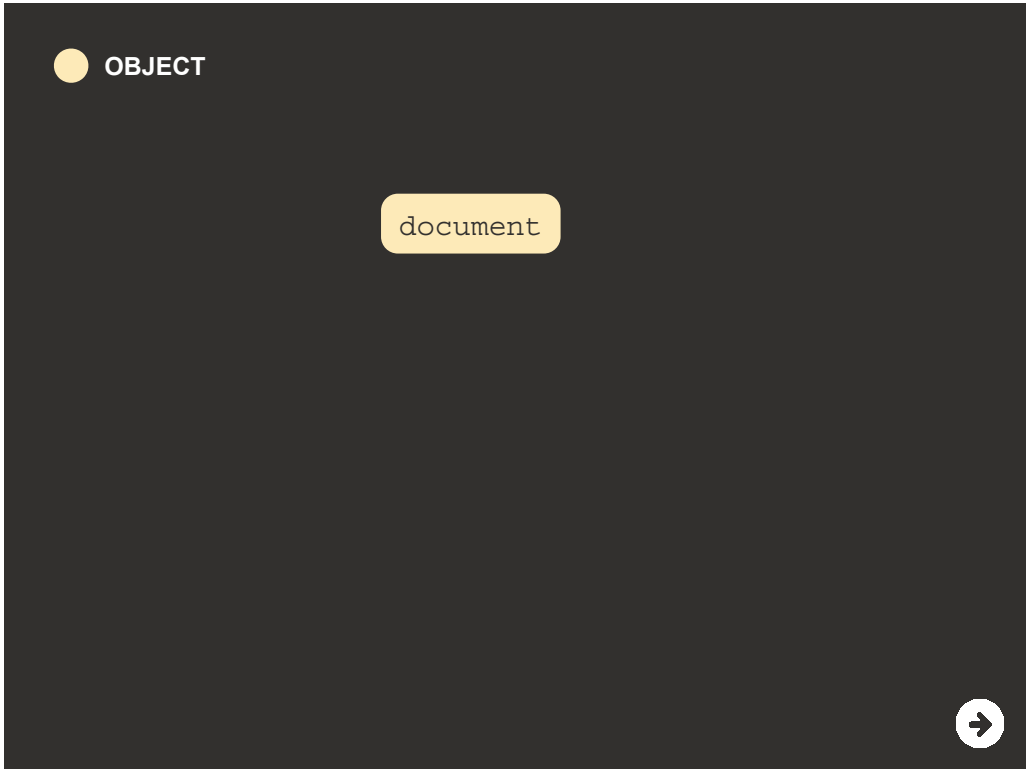
2

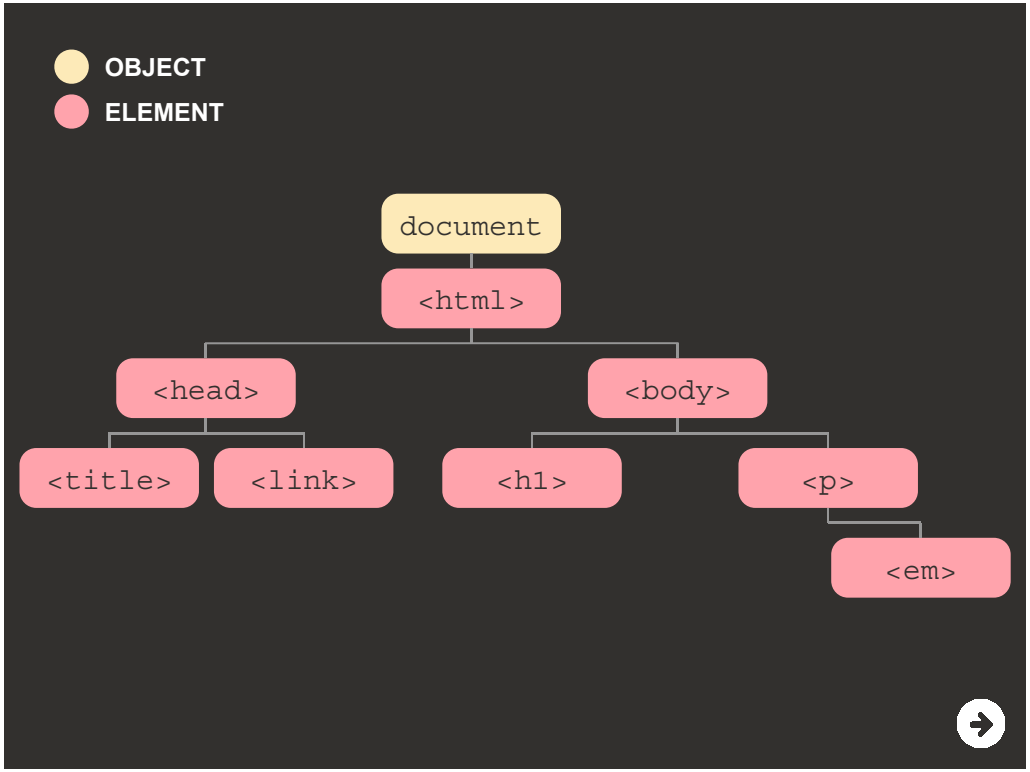
1

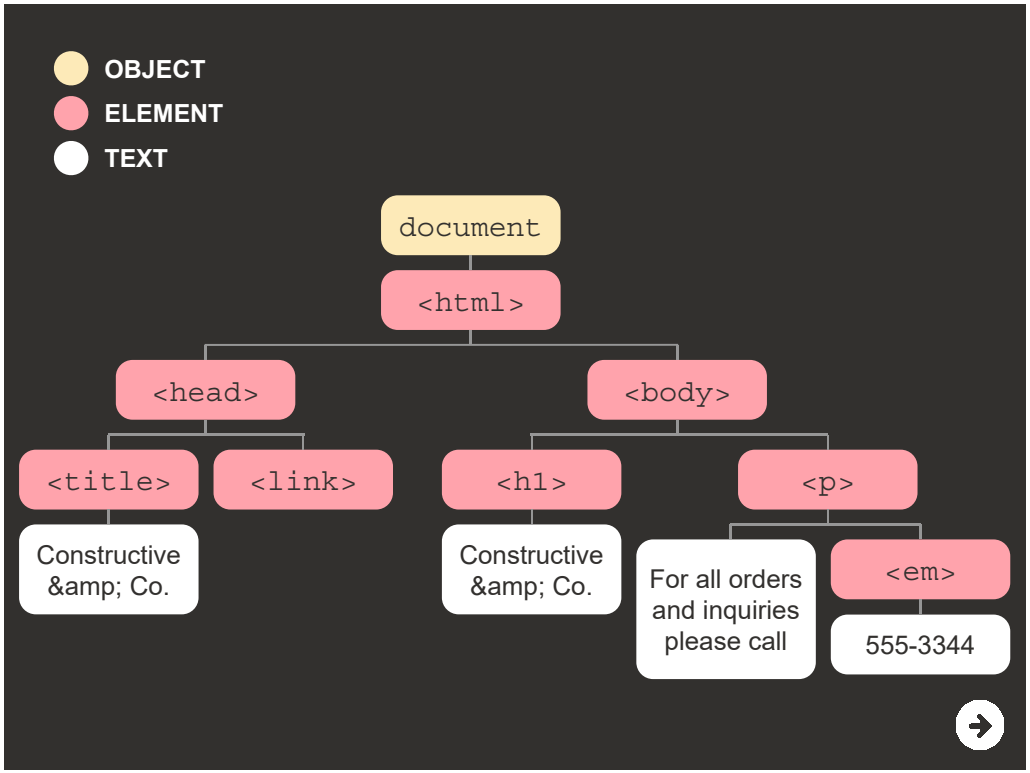
The browser receives a web page

2

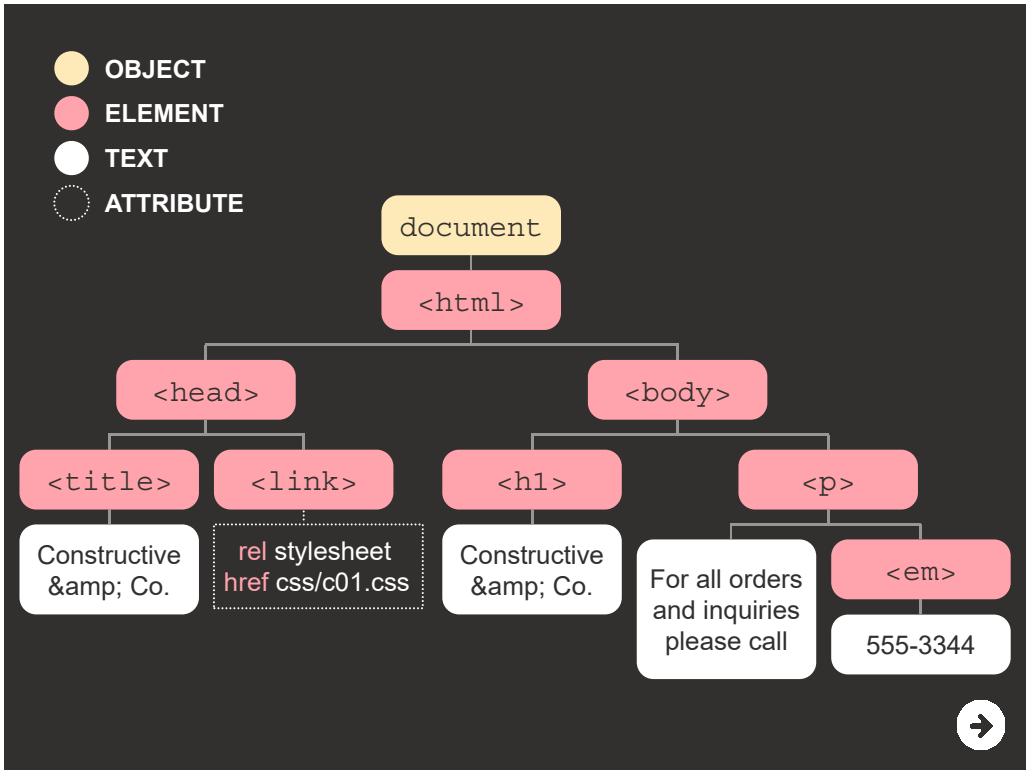
It creates a model of the page and stores it in memory


OBJECT
document


OBJECT
ELEMENT
document
<html>
<head>
<body>
<title>
<link>
<h1>
<p>


OBJECT
ELEMENT
TEXT
document
<html>
<head>
<body>
<title>
<link>
<h1>
<p>
Constructive & Co.
Constructive & Co.
For all orders and inquiries please call

555-3344


OBJECT
ELEMENT
TEXT
ATTRIBUTE
document
<html>
<head>
<body>
<title>
<link>
<h1>
<p>
Constructive & Co.
rel stylesheet
href css/c01.css
Constructive & Co.
For all orders and inquiries please call

555-3344

1

The browser receives a web page

2

It creates a model of the page and stores it in memory

3


1

The browser receives a web page

2

It creates a model of the page and stores it in memory

3

It shows the page on screen using a rendering engine