Introduction to Programming

Class 17, 1 March 2017

Introduction to Programming
Class 17, 1 March 2017

- **What is your astrological sign? What does it say about you?**

Introduction to Programming
Class 17, 1 March 2017

Goals

Goal 1: You will know how to implement an indefinite loop.

Goal 2: You will understand the difference between definite and indefinite loops.

Vocabulary

indefinite loop
definite loop
while loop

Code

```
while(){…}
```

Introduction to Programming
Class 17, 1 March 2017

1. Mr. Collins on Numbers (Check HW)
2. Go over LargeNumber.js
3. Warm Up
4. While loop lesson
5. Algorithmic thinking
6. Homework is H29

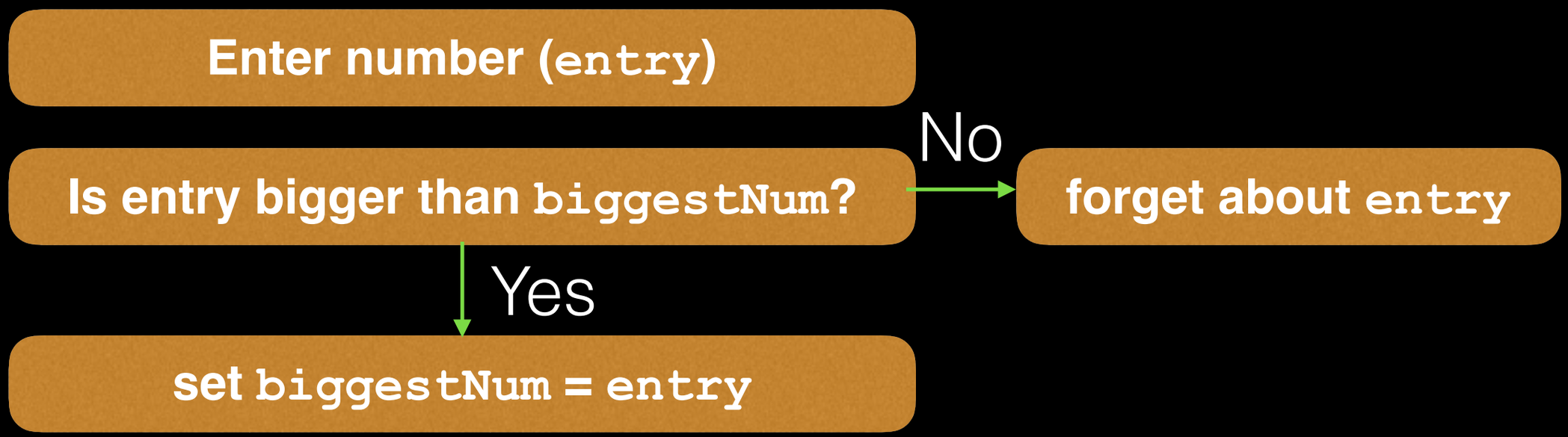
Practice!

- Write a program that prompts the user for three numbers and then displays the largest number.

Introduction to Programming
Class 17, 1 March 2017

Practice!

- Write a program that prompts the user for three numbers and then displays the largest number.



largeNumber.html

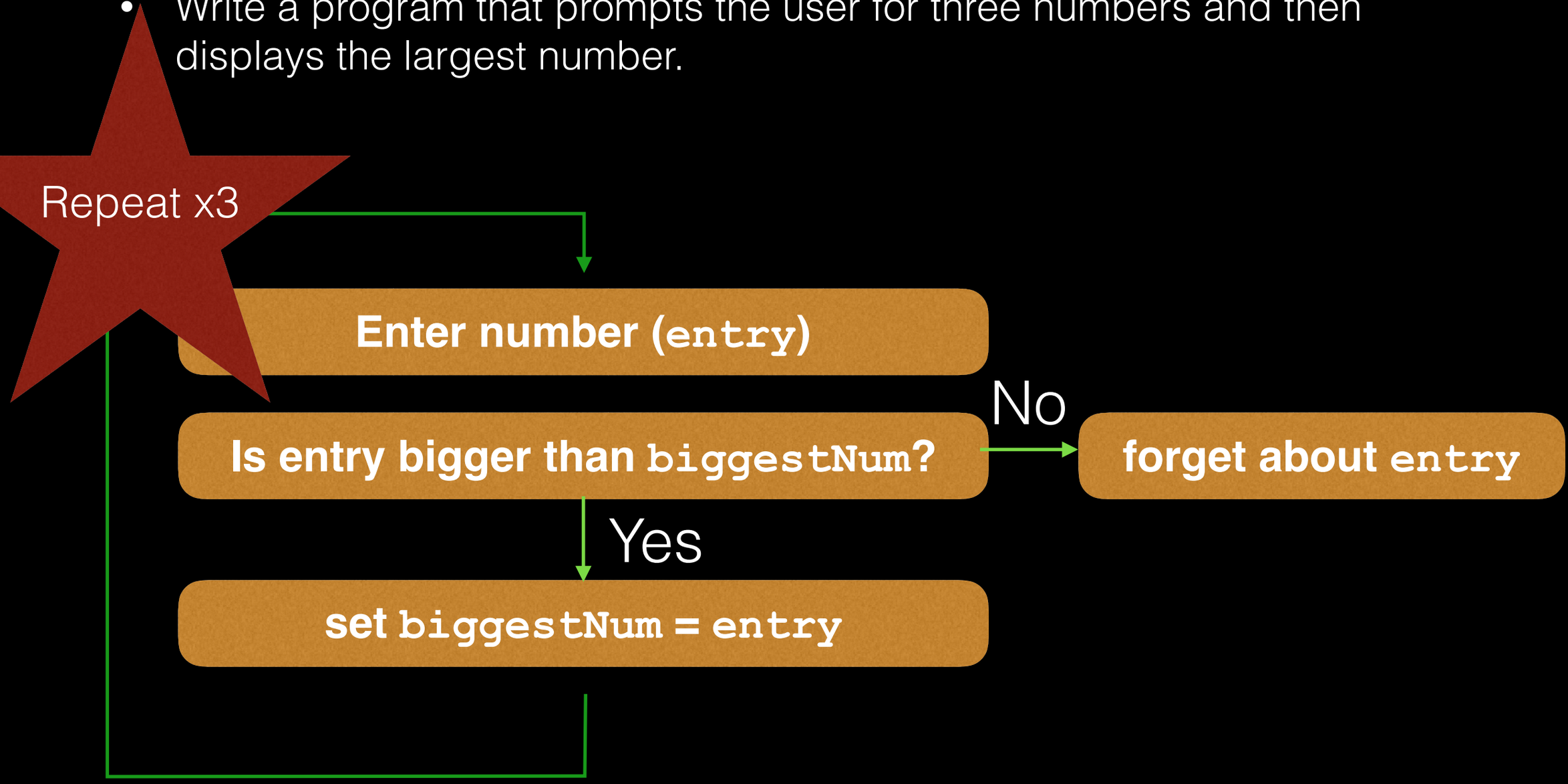
```
<!doctype html>
<html>
<head>
    <title>Largest Number</title>
</head>
<body>
   <script src="largeNumber.js"></script>
</body>
</html>
```

largeNumber.js

```
var biggestNum = 0;
var entryString = prompt("Please enter a number.");
entry = parseInt(entryString);
if (entry > biggestNum) {
    biggestNum = entry;
}
```

Practice!

- Write a program that prompts the user for three numbers and then displays the largest number.



largeNumber.html

```
<!doctype html>
<html>
<head>
    <title>Largest Number</title>
</head>
<body>
   <script src="largeNumber.js"></script>
</body>
</html>
```

largeNumber.js

```
var biggestNum = 0;

for (var i=0; i<3; i++) {
 var entryString = prompt("Please enter a number.");
 entry = parseInt(entryString);
 if (entry > biggestNum) {
  biggestNum = entry;
 }
}
```

largeNumber.html

```
<!doctype html>
<html>
<head>
    <title>Largest Number</title>
</head>
<body>
   <script src="largeNumber.js"></script>
</body>
</html>
```

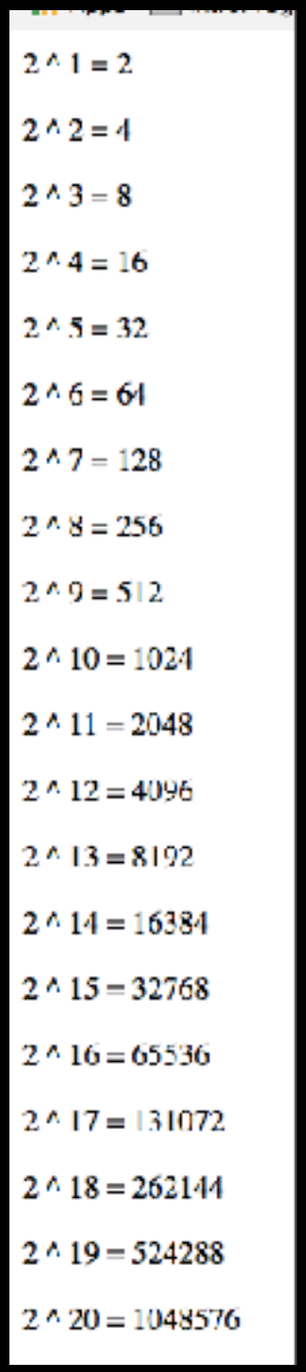
largeNumber.js

```
var biggestNum = -100000000;

for (var i=0; i<3; i++) {
    var entryString = prompt("Please enter a number.");
    entry = parseInt(entryString);
    if (entry > biggestNum) {
       biggestNum = entry;
    }
}

var message = "The largest number is " + biggestNum;

var para = document.createElement("p");
para.textContent = message;
document.body.appendChild(para);
```

Introduction to Programming
Class 17, 1 March 2017

Warm Up!

- Write a program that displays (on a webpage) , the first 20 powers of 2.



Introduction to Programming
Class 17, 1 March 2017

Warm Up!

- Write a program that displays (on a webpage) , the first 20 powers of 2.

2 ^ 1 = 2
2 ^ 2 = 4
2 ^ 3 = 8
2 ^ 4 = 16
2 ^ 5 = 32
2 ^ 6 = 64
2 ^ 7 = 128
2 ^ 8 = 256
2 ^ 9 = 512
2 ^ 10 = 1024
2 ^ 11 = 2048
2 ^ 12 = 4096
2 ^ 13 = 8192
2 ^ 14 = 16384
2 ^ 15 = 32768
2 ^ 16 = 65536
2 ^ 17 = 131072
2 ^ 18 = 262144
2 ^ 19 = 524288
2 ^ 20 = 1048576

```
for(var i=0; i<20;i++) {
    var num = Math.pow(2, i+1);
    print2(i+1, num);
}

function print2(power, answer) {
    var para = document.createElement("p");
    para.textContent = "2 ^ " + power + " = " + answer;
    document.body.appendChild(para);
}
```

Introduction to Programming
Class 17, 1 March 2017

Motivation

- Write a program that displays (on a webpage) , the powers of 2 less than 1,000,000,000

Introduction to Programming
Class 17, 1 March 2017

Motivation

- Write a program that displays (on a webpage) , the powers of 2 less than 1,000,000,000

```
for(var i=0; i<20;i++) {
    var num = Math.pow(2, i+1);
    if(num < 1000000000) {
        print2(i+1, num);
    }
}

function print2(power, answer) {
    var para = document.createElement("p");
    para.textContent = "2 ^ " + power + " = " + answer;
    document.body.appendChild(para);
}
```

Introduction to Programming
Class 17, 1 March 2017

Motivation

- Write a program that displays (on a webpage) , the powers of 2 less than 1,000,000,000

```
var i = 1;
var num = 0;
if (num < 1000000000) {
    num = Math.pow(2, i);
    print2(i, num)
    i = i+1;
}

function print2(power, answer) {
    var para = document.createElement("p");
    para.textContent = "2 ^ " + power + " = " + answer;
    document.body.appendChild(para);
}
```

Motivation

- Write a program that displays (on a webpage) , the powers of 2 less than 1,000,000,000

```
var i = 1;
var num = 0;
while (num < 1000000000) {
    num = Math.pow(2, i);
    print2(i, num)
    i = i+1;
}

function print2(power, answer) {
    var para = document.createElement("p");
    para.textContent = "2 ^ " + power + " = " + answer;
    document.body.appendChild(para);
}
```

DING!!

Indefinite Loop = While Loop

`while(condition) {…}`

```
while(condition) {
   // Code will repeat as long
   // as condition is true

   // Must change the
   // condition
}

var age = 5;
while(age < 10) {
   // Code will repeat as long
   // as condition is true
   alert("Hi, kid");

   // Must change the
   // condition
   age = age + 1;
}
alert("You're not a kid any more!");
```

```
if(condition) {
   // Code will execute as long
   // as condition is true

}

var age = 5;
if(age < 10) {
   // Code will execute as long
   // as condition is true
   alert("Hi, kid");
}
alert("Hi, mom!");
```

Practice

- Write a program that rolls a 6-sided die over and over again until you get a 1.

```
var die = 0;
while (die != 1) {
    die = Math.floor(6*Math.random() + 1);
    printDie(die);
}

function printDie(value) {
    var para = document.createElement("p");
    para.textContent = "You rolled a " + value;
    document.body.appendChild(para);
}
```

Introduction to Programming
Class 17, 1 March 2017

Algorithmic Thinking

- Computers closed.
- Write a program that will write all of the prime factors of number entered by the user.
    - For example. If the user entered "75", the output would be "3, 5, 5"
    - For example. If the user entered "3757208", the output would be "2, 2, 2, 7, 13, 13, 397"
- Think on your own for 3 minutes.
- Share with your table.
- Create a flow chart.
- Code in pairs.

Introduction to Programming
Class 17, 1 March 2017

Goals

Goal 1: You will know how to implement an indefinite loop.

Goal 2: You will understand the difference between definite and indefinite loops.

Vocabulary

indefinite loop
definite loop
while loop

Code

```
while(){…}
```

Homework

- Task H29