

# Introduction to Programming

Class 10, 31 January 2017

**Partners**

Randomize

# Goals

**Goal 1:** You will understand how computers make decisions.

**Goal 2:** You will know how to implement an if-else if-else statement in JavaScript.

**Goal 3:** You will know how to implement Boolean operators.

## Vocabulary

If - else if - else statement

Boolean operators

## Code

```
if () {  
} else if () {  
} else {}
```

&&

||

!

- **Would you rather watch videos or listen to music? Why?**

What is a synonym for  
**ALGORITHM?**

```
if (age <=5) {  
    alert("You get to ride for free.");  
    totalPrice = totalPrice + 0;  
}
```

What is the area in braces  
called?

code block

## Consider the following code;

### Code A

```
var grade = 93;  
if (grade >= 90) {  
    alert("You got an A.");  
}  
if (grade >= 80) {  
    alert("You got a B.");  
}  
if (grade >= 70) {  
    alert("You got a C.");  
} else {  
    alert("Eek. Try again.");  
}  
alert("Goodbye");
```

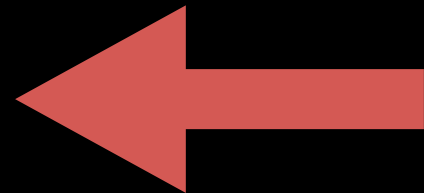
### Code B

```
var grade = 93;  
if (grade >= 90) {  
    alert("You got an A.");  
} else if (grade >= 80) {  
    alert("You got a B.");  
} else if (grade >= 70) {  
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} else {  
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}  
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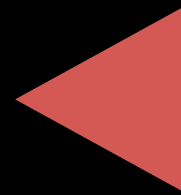
Set variable



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if (grade >= 90) {  
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}  
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```



Test Condition: True

## Consider the following code;

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}  
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```



Alert: "Goodbye"

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if (grade >= 70) {  
    alert("You got a C.");  
} else {  
    alert("Eek. Try again.");  
}  
alert("Goodbye");
```

### Code B

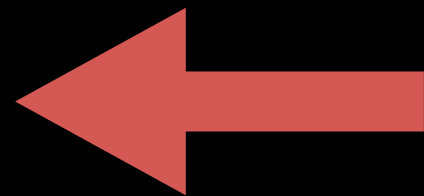
```
var grade = 93;  
if (grade >= 90) {  
    alert("You got an A.");  
} else if (grade >= 80) {  
    alert("You got a B.");  
} else if (grade >= 70) {  
    alert("You got a C.");  
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```



## Consider the following code;

### Code B

```
var grade = 93;  
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}  
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```



Set variable

## Consider the following code;

### Code B

```
var grade = 93;  
if (grade >= 90) {  
    alert("You got an A.");  
} else if (grade >= 80) {  
    alert("You got a B.");  
} else if (grade >= 70) {  
    alert("You got a C.");  
} else {  
    alert("Eek. Try again.");  
}  
alert("Goodbye");
```



## Consider the following code;

### Code B

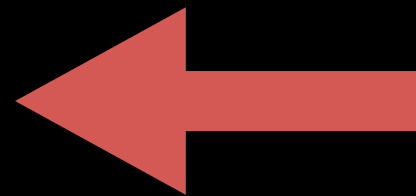
```
var grade = 93;  
if (grade >= 90) {  
    alert("You got an A.");  
} else if (grade >= 80) {  
    alert("You got a B.");  
} else if (grade >= 70) {  
    alert("You got a C.");  
} else {  
    alert("Eek. Try again.");  
}  
alert("Goodbye");
```



## Consider the following code;

### Code B

```
var grade = 63;  
if (grade >= 90) {  
    alert("You got an A.");  
} else if (grade >= 80) {  
    alert("You got a B.");  
} else if (grade >= 70) {  
    alert("You got a C.");  
} else {  
    alert("Eek. Try again.");  
}  
alert("Goodbye");
```

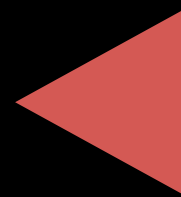


Set Variable

## Consider the following code;

### Code B

```
var grade = 63;  
if (grade >= 90) {  
    alert("You got an A.");  
} else if (grade >= 80) {  
    alert("You got a B.");  
} else if (grade >= 70) {  
    alert("You got a C.");  
} else {  
    alert("Eek. Try again.");  
}  
alert("Goodbye");
```

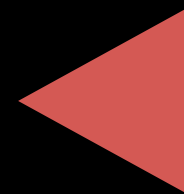


Test Condition: False

## Consider the following code;

### Code B

```
var grade = 63;  
if (grade >= 90) {  
    alert("You got an A.");  
} else if (grade >= 80) {  
    alert("You got a B.");  
} else if (grade >= 70) {  
    alert("You got a C.");  
} else {  
    alert("Eek. Try again.");  
}  
alert("Goodbye");
```



Test Condition: False

## Consider the following code;

### Code B

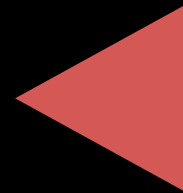
```
var grade = 63;  
if (grade >= 90) {  
    alert("You got an A.");  
} else if (grade >= 80) {  
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```



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### Code B

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var grade = 63;  
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} else if (grade >= 70) {  
    alert("You got a C.");  
} else {  
    alert("Eek. Try again.");  
}  
alert("Goodbye");
```



Alert: "Eek"



## Consider the following code;

### Code B

```
var grade = 63;  
if (grade >= 90) {  
    alert("You got an A.");  
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}  
alert("Goodbye");
```



## On one computer:

- Write a program that determines if a given year is a leap year.

If a year is a multiple of 4,  
it's a leap year.

Leap Years	Not Leap Years
• 1996	• 1997
• 2016	• 2014
• 1880	• 1878
• 104	• 101

Start

Alert "It's a leap year"

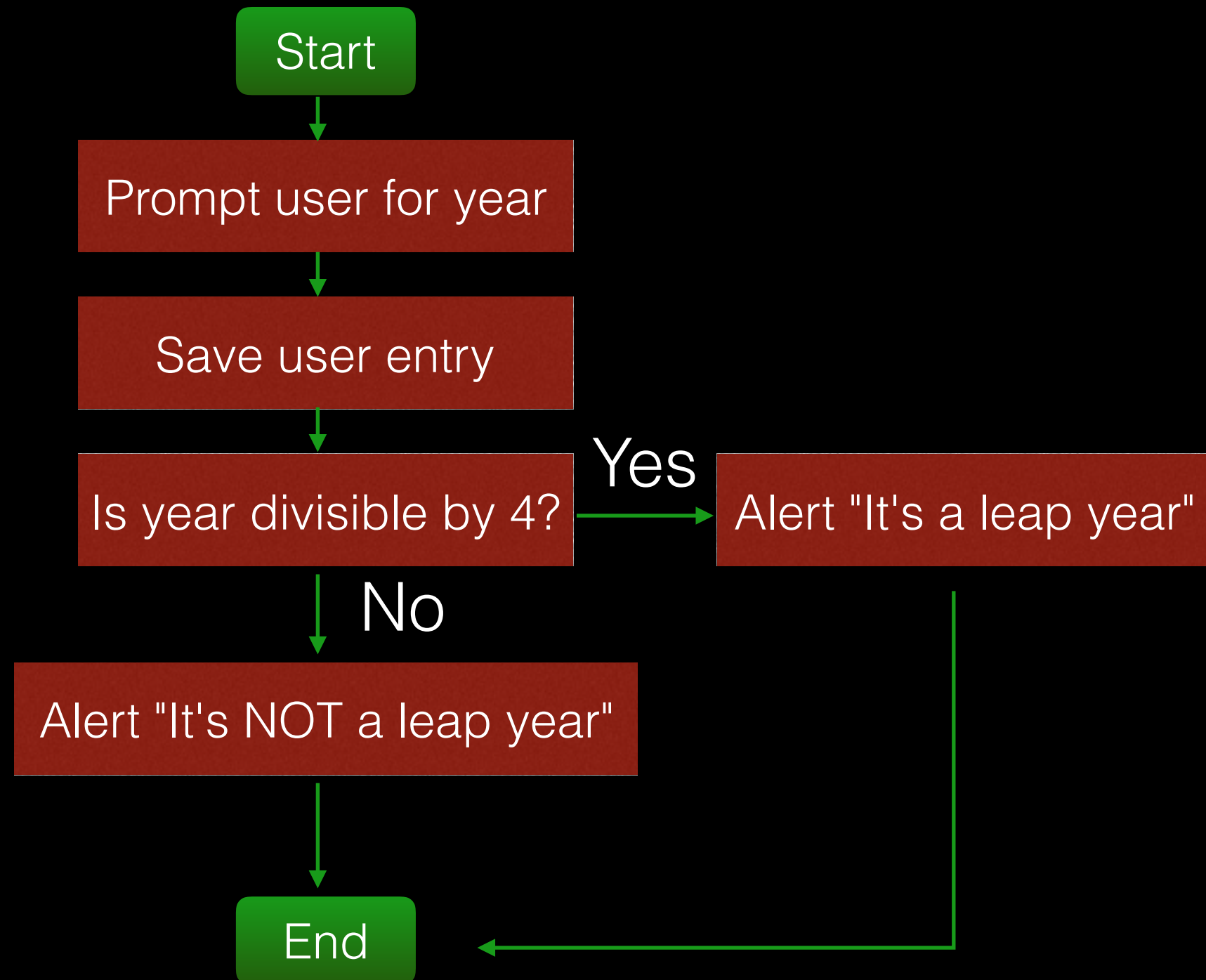
Prompt user for year

Alert "It's NOT a leap year"

Is year divisible by 4?

Save user entry

End



If a year is a multiple of 4,  
it's a leap year.

```
if (year % 4 == 0) {  
    alert("It's a leap year.");  
} else {  
    alert("Not a leap year.");  
}
```

If a year is a multiple of 4  
AND  
If a year is not a multiple  
of 100  
it's a leap year.

Leap Years	Not Leap Years
• 1996	• 1997
• 2016	• 1900
• 1880	• 1800
• 104	• 2100

If a year is a multiple of 4

`year % 4 == 0`

AND

`& &`

If a year is not a multiple of 100

`year % 100 != 0`

If a year is a multiple of 4

AND

If a year is not a multiple of 100

Boolean AND.  
True only if both operands are true

`year % 4 == 0 && year % 100 != 0`

Boolean operator will be LAST in the  
order of operations (other than =)

Now modify your condition.



## Does it work?

### Leap Years

- 1996
- 2016
- 1880
- 104

### Not Leap Years

- 1997
- 1900
- 1800
- 2100

If a year is a multiple of 4  
AND

If a year is not a multiple  
of 100  
it's a leap year.

OR

A year is a multiple of 400  
it's a leap year.

Leap Years

- 1996
- 2016
- 1600
- 2000

Not Leap Years

- 1997
- 2015
- 1800
- 2100

If a year is a multiple of 4

```
year % 4 == 0
```

AND

```
& &
```

If a year is not a multiple of 100

```
year % 100 != 0
```

OR

```
||
```

A year is a multiple of 400

```
year % 400 == 0
```

If a year is a multiple of 4


AND

If a year is not a multiple of 100

OR

A year is a multiple of 400

Boolean OR.  
True only if either operands is true



```
(year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)
```

Now modify your condition.

## Does it work?

### Leap Years

- 1996
- 2016
- 1600
- 2000

### Not Leap Years

- 1997
- 2015
- 1800
- 2100

```
if ((year%4 == 0 && year%100 != 0) || (year%400 == 0))  
{  
    alert("It's a leap year.");  
} else {  
    alert("Not a leap year.");  
}
```

# Boolean Operators

&&	AND	A && B	True if A and B are true.
	OR	A    B	True if A or B is true.
!	NOT	!A	True if A is false.

# Goals

**Goal 1:** You will understand how computers make decisions.

**Goal 2:** You will know how to implement an if-else if-else statement in JavaScript.

**Goal 3:** You will know how to implement Boolean operators.

## Vocabulary

If - else if - else statement

Boolean operators

## Code

```
if () {  
} else if () {  
} else {}
```

&&

||

!