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Scratch Programming

Lesson 3B : Multiple Decisions Within One Script

A New Problem : Checkout

- After told the price of an item a customer wants to purchase, tell how much they must fork over to the cashier, given they might hold a 10% off coupon, and on some items they have to pay tax.

A New Problem : Checkout

- After told the price of an item a customer wants to purchase, tell how much they must fork over to the cashier, given they might hold a 10% off coupon, and on some items they have to pay tax. Also, announce how much change they should get back, based on how much cash they give the cashier.

Checkout : Some Variables

- Item - name of item they are buying

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- Coupon -
  - Y indicates they have a coupon
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- Item - name of item they are buying
- Coupon -
  - Y indicates they have a coupon
  - N indicates they do not
- Bill - tells what they owe at any moment
  - set this to the original cost of the item and change if necessary based on tax & coupon

Checkout : Some Variables

- Item - name of item they are buying
- Coupon -
  - Y indicates they have a coupon
  - N indicates they do not
- Bill - tells what they owe at any moment
- Cash - amount they give to cashier

Checkout : Assumptions

Since problem does not tell us, let us make some assumptions.

- Tax rate?

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Checkout : Assumptions

Since problem does not tell us, let us make some assumptions.

- Tax rate? Lets say they pay 7% sales tax
- Which items are taxed? For now, lets say everything but soda and cereal. [We will design script so it can easily be expanded to exclude other items.]

First Version: Coupons / No tax

- When working on code, it is sometimes smart to work on a simplier version first that only does some of what you want, and then later modified that code to do more things

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- When working on code, it is sometimes smart to work on a simplier version first that only does some of what you want, and then later modified that code to do more things
- Lets do a version that handles the coupons if the person has it, but doesn't handle taxes yet

Checkout : Input

- Find out item, its costs and whether there is a coupon:

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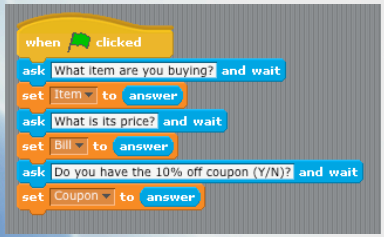
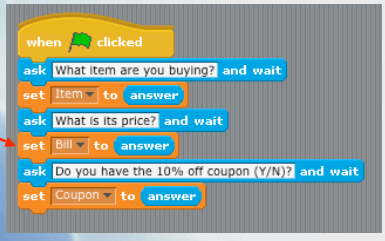


Checkout : Input

- Find out item, its costs and whether there is a coupon:

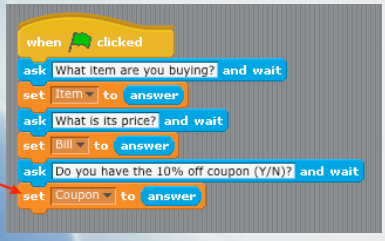
Notice we start bill to be price of the item



Checkout : Input

- Find out item, its costs and whether there is a coupon:

We have asked them to answer with Y or N



Checkout : Calculation

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  Example:

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  So bill becomes how much?

Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?

  Bill = ?

  Example:

  Bill (item cost) currently $100

  10% off is how many dollars? $10

  So bill becomes how much? $90

Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?

  Bill = ?

  general equation?

  Example:

  Bill (item cost) currently $100

  10% off is how many dollars? $10

  So bill becomes how much? $90

Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?

  Bill = ?

  Bill = 90

  Example:

  Bill (item cost) currently $100

  10% off is how many dollars? $10

  So bill becomes how much? $90

Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?

  Bill = ?

  Bill = 90 = 100 - 10

  Example:

  Bill (item cost) currently $100

  10% off is how many dollars? $10

  So bill becomes how much? $90

Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?

  Bill = ?

  Bill = 90 = 100 - 10 = Bill - .10 * Bill

  Example:

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Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?

  Bill = Bill - .10 * Bill

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Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?

  Bill = Bill - .10 * Bill

  this is actually the same as .9 * Bill

  Example:

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Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?

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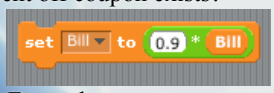
Checkout : Calculation

- What is the math to adjust the bill if the ten percent off coupon exists?



  Example:

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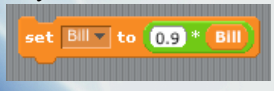
Checkout : Calculation

- Should we always adjust the bill in this way for every customer?



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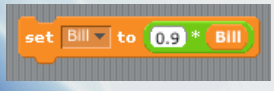
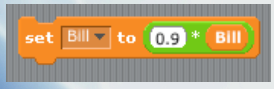


- No only for some people right?

Checkout : Calculation

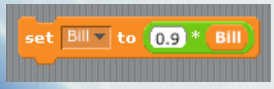
- Should we always adjust the bill in this way for every customer?



- Only if they have a coupon.

Checkout : Calculation

- Should we always adjust the bill in this way for every customer?



- Only if they have a coupon. We sometimes do it.

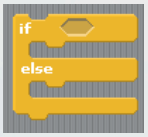
Checkout : Calculation

- What structure do you use to do something sometimes?
- Only if they have a coupon. We sometimes do it.

Checkout : Calculation

- What structure do you use to do something sometimes?

Either 

Or 

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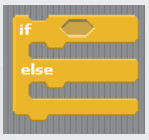
Or 

Which one?

- Only if they have a coupon. We sometimes do it.

Checkout : Calculation

- What structure do you use to do something sometimes?

Which one?

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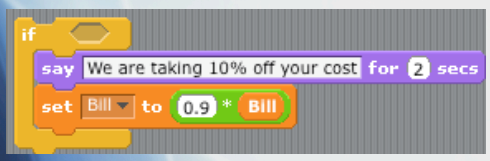
Checkout : Calculation

- So for coupon change bill within an IF. We might as well tell them what we are doing.



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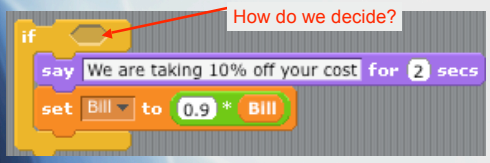

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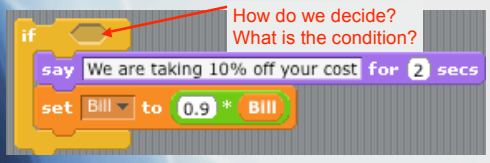

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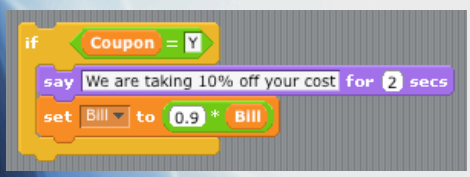
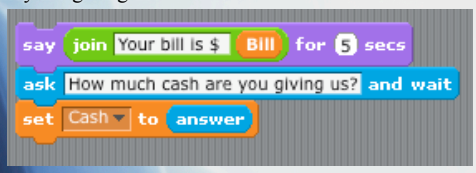


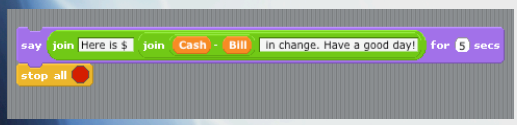
Checkout : Output

- Tell them the bill and find out how much cash they are giving us.



Checkout : Output

- Calculate and announce change given back.



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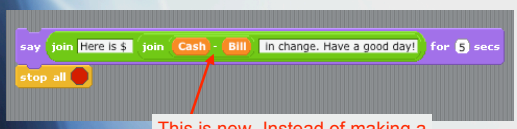
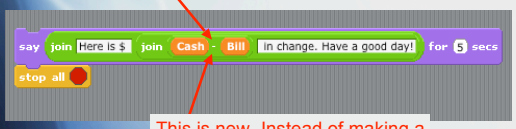


This is new. Instead of making a new variable, and using a Set, we just did the calculation within the Say itself.

Checkout : Output

- Calculate and announce change given back.

Simple calculation. Think about it ….



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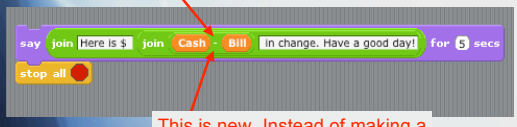
Checkout : Output

- Calculate and announce change given back.

If Bill was $80 and they gave us $100 Cash …



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Checkout : Output

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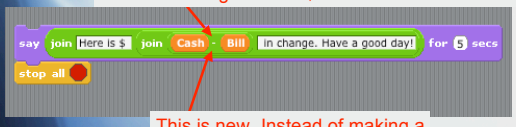
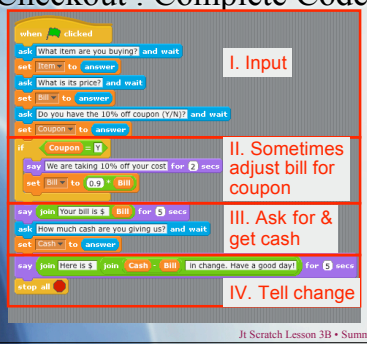
If Bill was $80 and they gave us $100 Cash …
… we should give them $20 back .. Or Cash - Bill



This is new. Instead of making a new variable, and using a Set, we just did the calculation within the Say itself.

Checkout : Complete Code



I. Input

II. Sometimes adjust bill for coupon

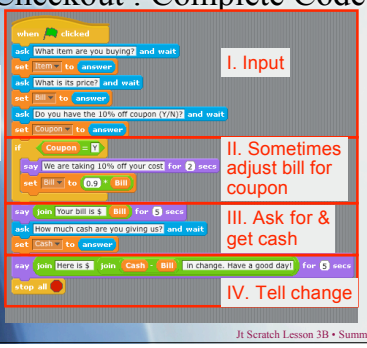
III. Ask for & get cash

IV. Tell change

Checkout : Complete Code

Demo:

Checkout 1



I. Input

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Checkout : Handling the taxes

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- The code has to decide to charge taxes or not, but it is definitely going to do something in either case.

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- Lets say when we handle taxes, we want to tell them if we are charging taxes or not, and of course, add on the 7% when we have to.
- The code has to decide to charge taxes or not, but it is definitely going to do something in either case.
- What type of statement should we use?

Checkout : Handling the taxes

- decide but either way do something. What type of statement should we use?

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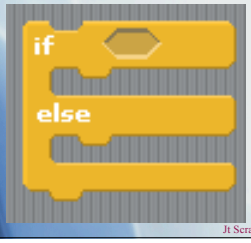
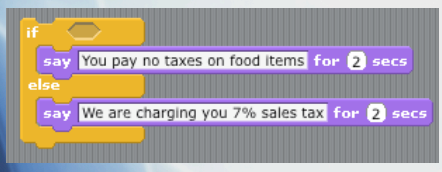


Checkout : Handling the taxes

- Tell them if we are taxing them or not.



Checkout : Handling the taxes

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  Example: Bill is $100 before tax

  How many dollars is tax?

Checkout : Handling the taxes

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Checkout : Handling the taxes

- What do we do to the bill if we add on 7% tax?

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  How much is new Bill? $107

Checkout : Handling the taxes

- What do we do to the bill if we add on 7% tax?

Bill = general equation?

Example: Bill is $100 before tax

How many dollars is tax? $7

How much is new Bill? $107

Checkout : Handling the taxes

- What do we do to the bill if we add on 7% tax?

Bill = 1.07 * Bill

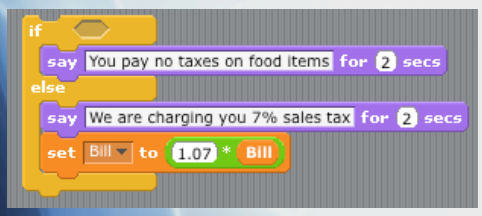
Example: Bill is $100 before tax

How many dollars is tax? $7

How much is new Bill? $107

Checkout : Handling the taxes

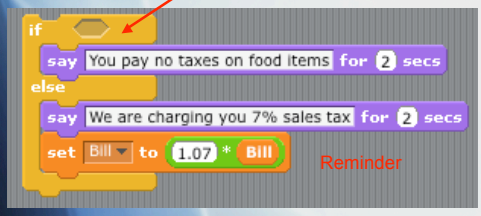
- Code so far:



Checkout : Handling the taxes

- Code so far:

Lets say soda was the only thing with no tax. What condition do we use?



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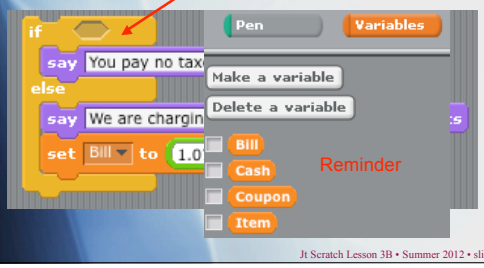

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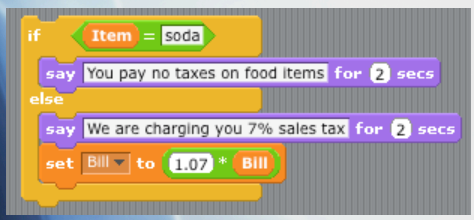
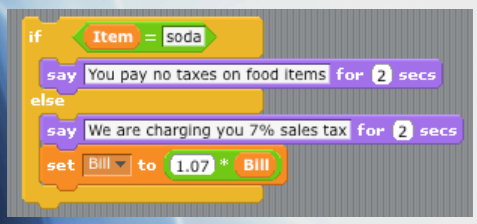


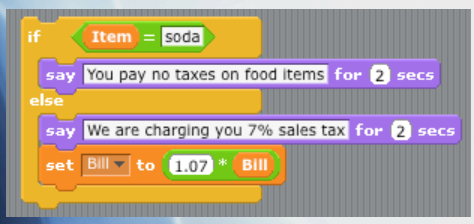
Checkout : Handling the taxes

- But more than what item has no tax.



Checkout : Handling the taxes

- What can we do?



Quick Lesson: Logical Operators

- Three boolean or logical operators can be used to make more complex conditions to use in IFs and elsewhere.

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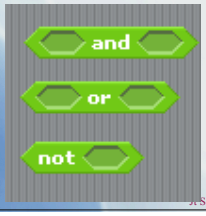

Quick Lesson: Logical Operators

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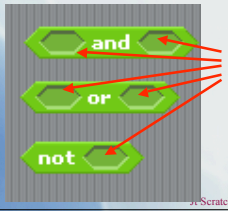

Build these larger conditions by placing smaller condition in these spots.

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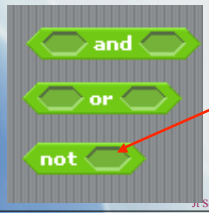

NOT reverses the smaller condition

NOT is False if little condition is True

Quick Lesson: Logical Operators

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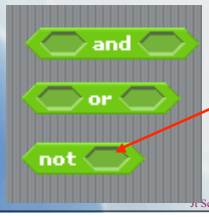


NOT reverses the smaller condition

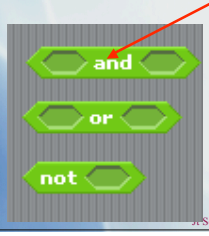
and vice versa

Quick Lesson: Logical Operators

- How do these work? They need to come out True or False.

AND is only TRUE when both smaller conditions are TRUE

otherwise AND is FALSE

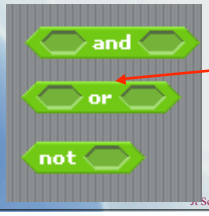


Quick Lesson: Logical Operators

- How do these work? They need to come out True or False.

OR is only FALSE when both smaller conditions are FALSE

otherwise OR is TRUE



Quick Lesson: Logical Operators

- Example: Item is Apple and Weight is 500

Is this True or False?

Quick Lesson: Logical Operators

- Example: Item is Apple and Weight is 500

Is this True or False? FALSE

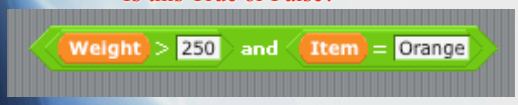
NOT reverses the smaller condition

NOT is False if little condition is True

Quick Lesson: Logical Operators

- Example: Item is Apple and Weight is 500

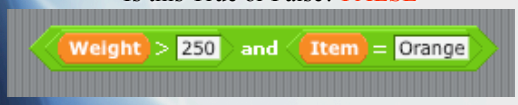
Is this True or False?



Quick Lesson: Logical Operators

- Example: Item is Apple and Weight is 500

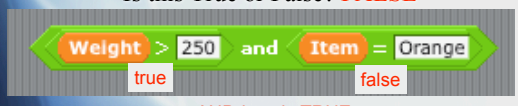
Is this True or False? FALSE



Quick Lesson: Logical Operators

- Example: Item is Apple and Weight is 500

Is this True or False? FALSE



AND is only TRUE
when both smaller
conditions are TRUE

otherwise AND is
FALSE

Quick Lesson: Logical Operators

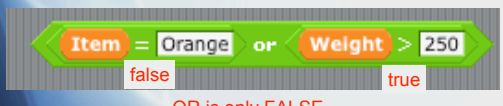
- Example: Item is Apple and Weight is 500

Is this True or False?

Quick Lesson: Logical Operators

- Example: Item is Apple and Weight is 500

Is this True or False? TRUE

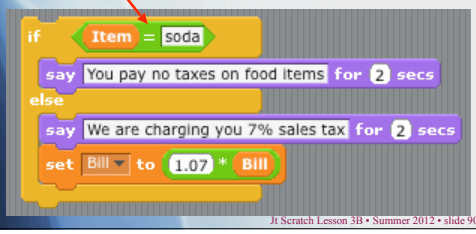


OR is only FALSE
when both smaller
conditions are FALSE

otherwise OR is TRUE

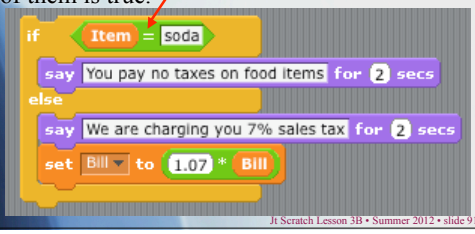
Checkout : Handling the taxes

- What can we do if more than one item has no taxes?



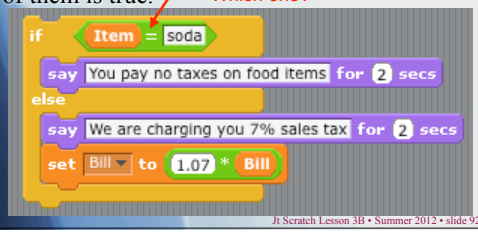
Checkout : Handling the taxes

- We need an operator that can check multiple possibilities but is true if just one of them is true.



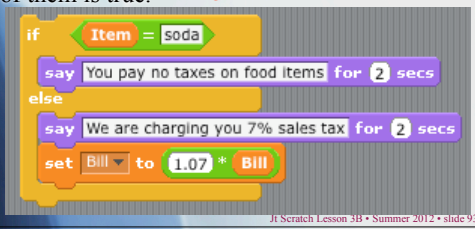
Checkout : Handling the taxes

- We need an operator that can check multiple possibilities but is true if just one of them is true. Which one?



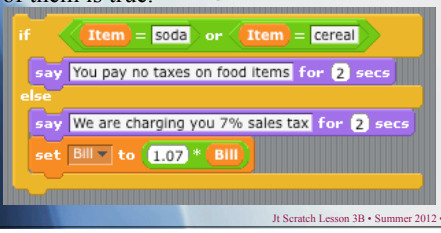
Checkout : Handling the taxes

- We need an operator that can check multiple possibilities but is true if just one of them is true. OR



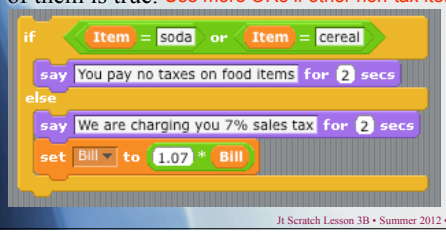
Checkout : Handling the taxes

- We need an operator that can check multiple possibilities but is true if just one of them is true. OR



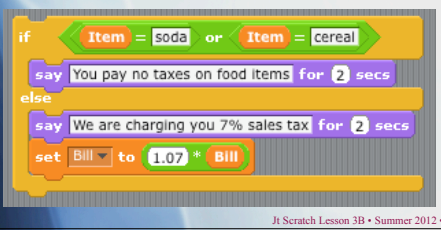
Checkout : Handling the taxes

- We need an operator that can check multiple possibilities but is true if just one of them is true. Use more ORs if other non-tax items

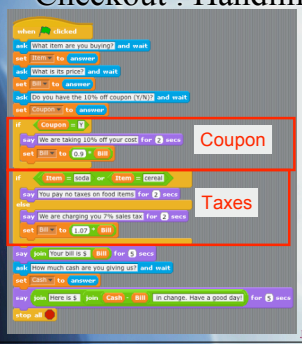


Checkout : Handling the taxes

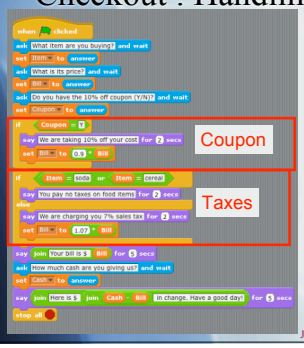
- Place this in our code after coupon handled.



Checkout : Handling the taxes



Checkout : Handling the taxes



Demo:

Checkout 2

Checkout : Problems

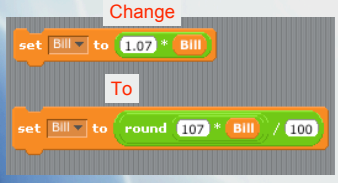
- Too many decimal digits in bill.

Checkout : Problems

- Too many decimal digits in bill.

  TRICK:

Change



Checkout : Problems

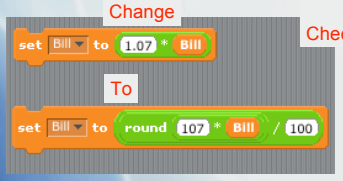
- Too many decimal digits in bill.

  TRICK:

Demo:

Checkout 3

Change



Checkout : Problems

- Whoops, they might not give us enough cash!

Checkout : Problems

- Whoops, they might not give us enough cash! We should complain if they do not give us enough.

Checkout : Problems

- Whoops, they might not give us enough cash! We should complain if they do not give us enough. So, we want to decide between telling them how much change they get back or otherwise complaining.

Checkout : Problems

- Whoops, they might not give us enough cash! We should complain if they do not give us enough. So, we want to decide between telling them how much change they get back or otherwise complaining. What do we use if we have to decide between two choices and we definitely want to do one of the two?

Checkout : Problems

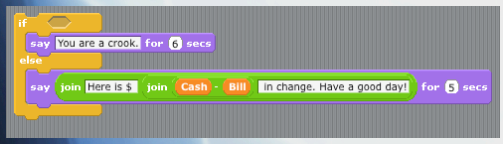
- Whoops, they might not give us enough cash! We should complain if they do not give us enough. So, we want to decide between telling them how much change they get back or otherwise complaining. What do we use if we have to decide between two choices and we definitely want to do one of the two?

Checkout : Problems

- Whoops, they might not give us enough cash! We should complain if they do not give us enough. So, we want to decide between telling them how much change they get back or otherwise complaining. What do we use if we have to decide between two choices and we definitely want to do one of the two? IF/ELSE

Checkout : Problems

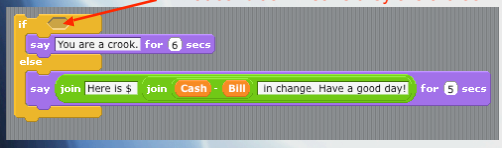
- What do we use if we have to decide between two choices and we definitely want to do one of the two? IF/ELSE



Checkout : Problems

- What do we use if we have to decide between two choices and we definitely want to do one of the two? IF/ELSE

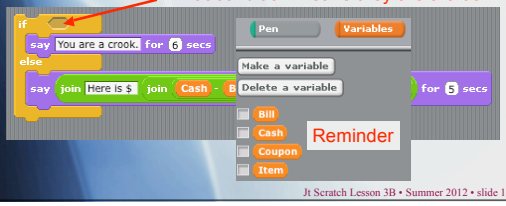
What condition means they are a crook?



Checkout : Problems

- What do we use if we have to decide between two choices and we definitely want to do one of the two? IF/ELSE

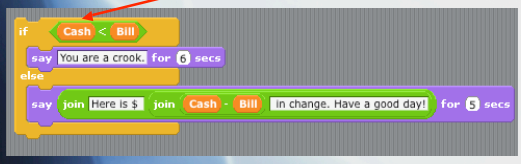
What condition means they are a crook?



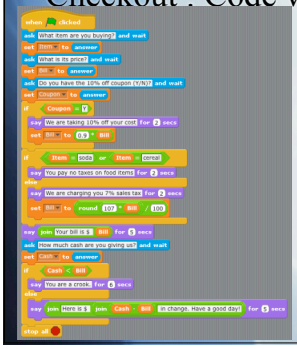
Checkout : Problems

- What do we use if we have to decide between two choices and we definitely want to do one of the two? IF/ELSE

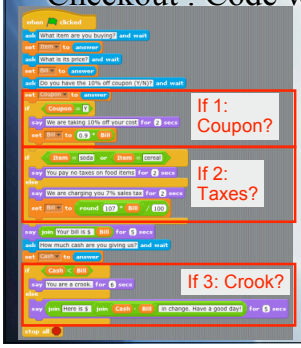
What condition means they are a crook?



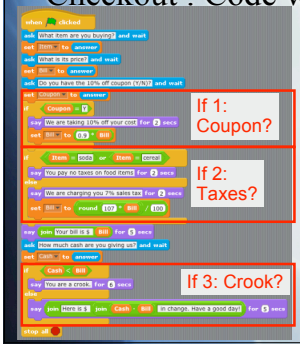
Checkout : Code without Problems



Checkout : Code without Problems



Checkout : Code without Problems



Demo:

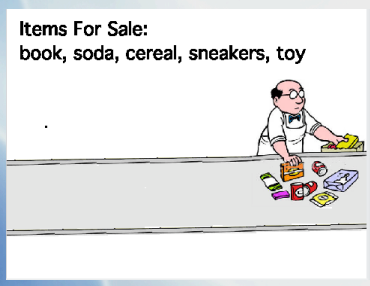
Checkout 4

Checkout : Multimedia Added

Demo: Checkout

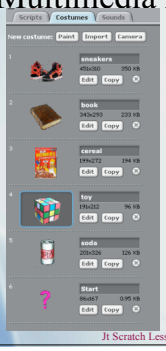
Checkout : Multimedia Added

- Stage



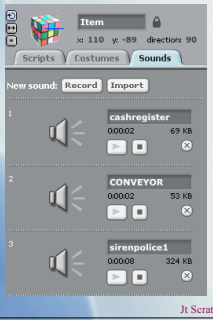
Checkout : Multimedia Added

- Sprite costumes



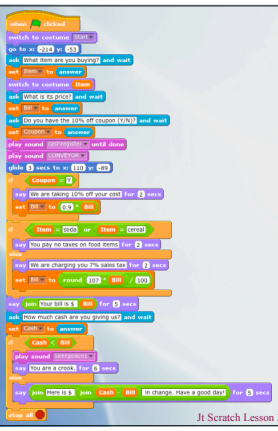
Checkout : Multimedia Added

- Sounds



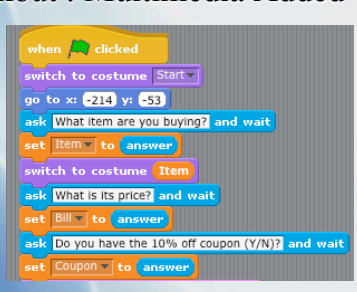
Checkout : Multimedia Added

- Script



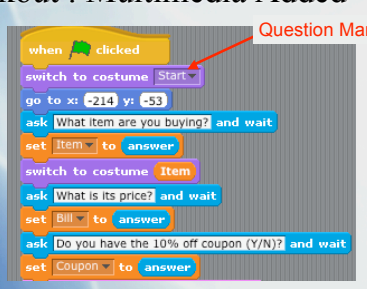
Checkout : Multimedia Added

- Start



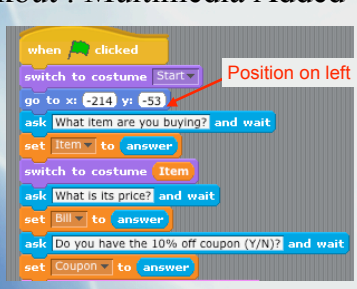
Checkout : Multimedia Added

- Start



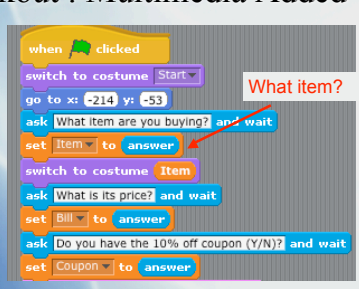
Checkout : Multimedia Added

- Start



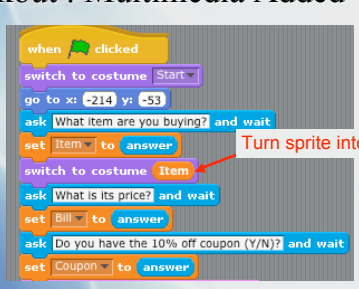
Checkout : Multimedia Added

- Start



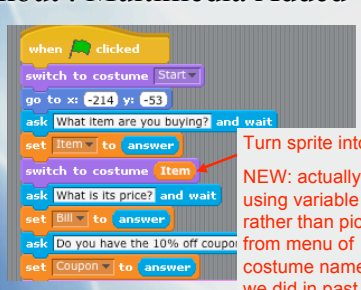
Checkout : Multimedia Added

- Start



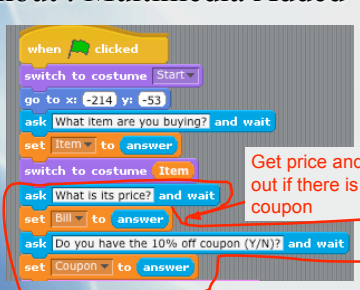
Checkout : Multimedia Added

- Start



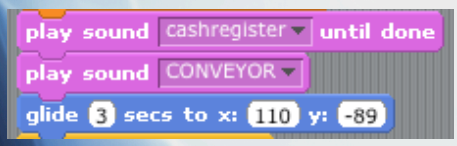
Checkout : Multimedia Added

- Start



Checkout : Multimedia Added

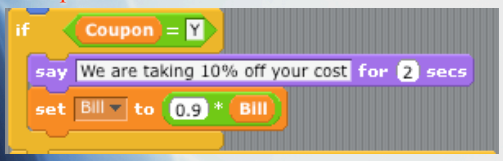
- Fun Effects



Play sound effects and show item moving down checkout aisle

Checkout : Multimedia Added

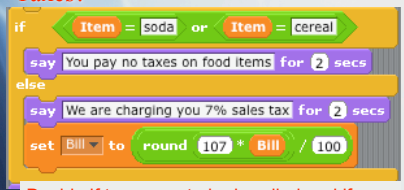
- Coupon?



Decide if coupon must be handled and if so change the bill appropriately

Checkout : Multimedia Added

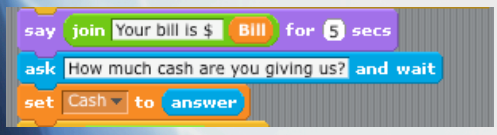
- Taxes?



Decide if taxes are to be handled and if so change the bill appropriately. Either way tell person whether taxes being charged.

Checkout : Multimedia Added

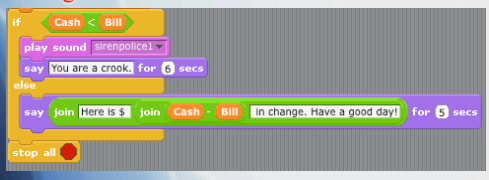
- Handle transaction



Tell person what the bill is and get their money.

Checkout : Multimedia Added

- Change?

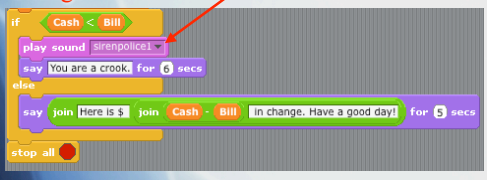


Decide if they gave enough money and if so, tell them the change they get. Otherwise complain!

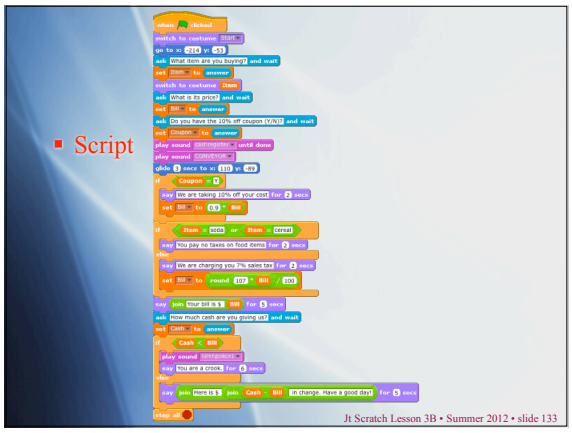
Checkout : Multimedia Added

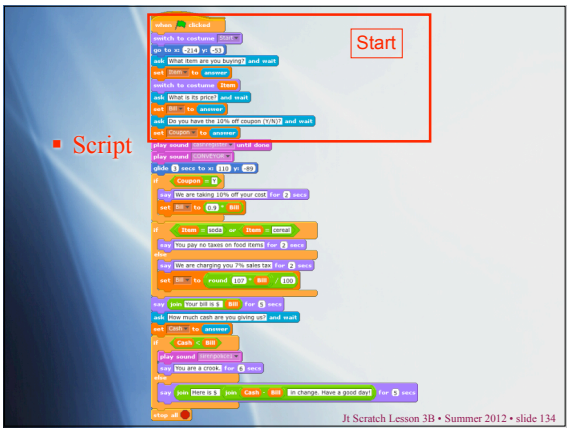
- Change?

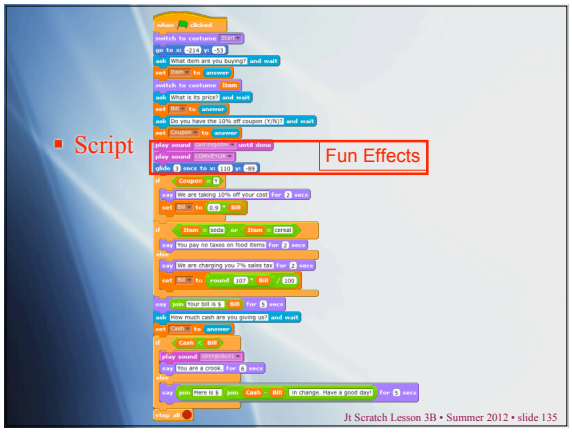
Nice use of sound effect

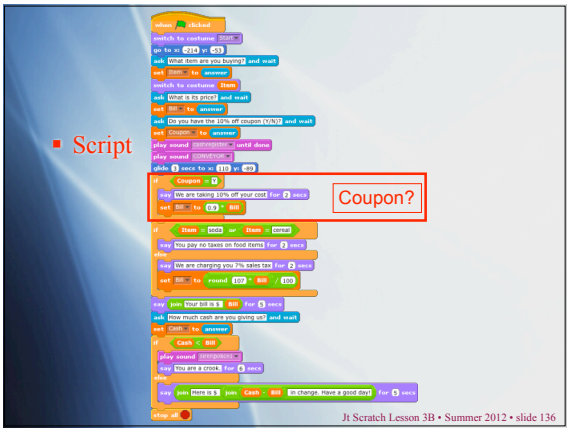


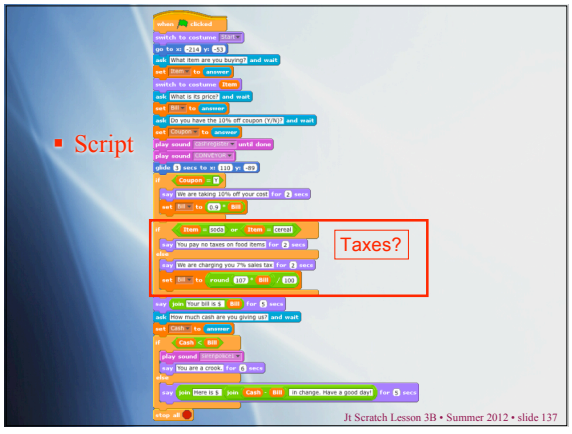
Decide if they gave enough money and if so, tell them the change they get. Otherwise complain!

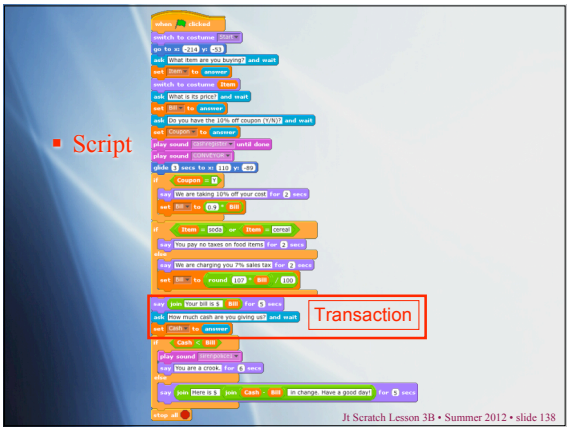

Script
Jt Scratch Lesson 3B • Summer 2012 • slide 133


Script
Start
Jt Scratch Lesson 3B • Summer 2012 • slide 134

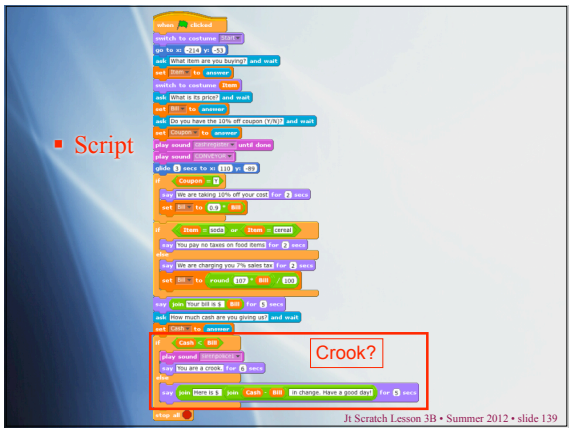

Script
Fun Effects
Jt Scratch Lesson 3B • Summer 2012 • slide 135


Script
Coupon?
Jt Scratch Lesson 3B • Summer 2012 • slide 136

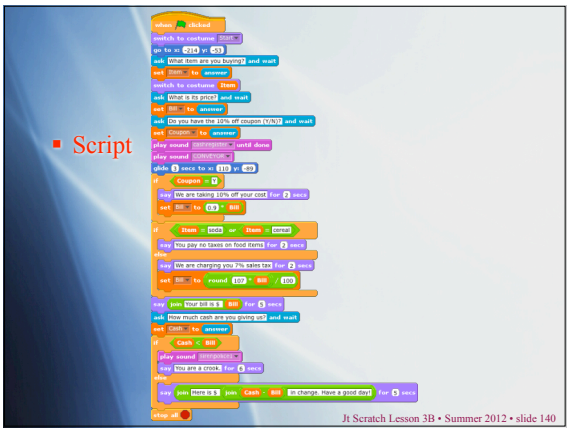

Script
Taxes?
Jt Scratch Lesson 3B • Summer 2012 • slide 137


Script
Transaction
Jt Scratch Lesson 3B • Summer 2012 • slide 138

- Script



- Script



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