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.

Checkout: Some Variables

- Item - name of item they are buying
- Coupon - Y indicates they have a coupon, N indicates they do not
Checkout : Some Variables

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- Bill - tells what they owe at any moment

Checkout : Some Variables
- Item - name of item they are buying
- Coupon -
  - Y indicates they have a coupon
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- 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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- Tax rate? Let's say they pay 7% sales tax
- Which items are taxed?
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Since problem does not tell us, let us make some assumptions.
- Tax rate? Let's say they pay 7% sales tax.
- Which items are taxed? For now, let's say everything but soda and cereal.

First Version: Coupons / No tax

- When working on code, it is sometimes smart to work on a simpler version first that only does some of what you want, and then later modified that code to do more things.
- Let's 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.
Checkout : Input

- Find out item, its costs and whether there is a coupon.
  
  Notice we start bill to be price of the item.

Checkout : Calculation

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

  Example:
  
  Bill (item cost) currently $100
  10% off is how many dollars?

  Example:
  
  Bill (item cost) currently $100
  10% off is how many dollars? $10
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 = ?

Example:
  Bill (item cost) currently $100
  10% off is how many dollars? $10
  So bill becomes how much? $90

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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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  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 - .10 * Bill
  this is actually the same as .9 * 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 = .9 * Bill

Example:
  Bill (item cost) currently $100
  10% off is how many dollars? $10
  So bill becomes how much? $90

Checkout : Calculation

• Should we always adjust the bill in this way for every customer?
  Bill = .9 * Bill

• 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.

- 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.

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

Checkout: Calculation

- What structure do you use to do something sometimes?
- Either

- Which one?

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

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

```scratch
if
  say We are taking 10% off your cost for 2 sec
ten
set Bill to 0.9 * Bill
end
```

Checkout : Calculation

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  say We are taking 10% off your cost for 2 sec
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Checkout : Calculation

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

```scratch
if Coupon = y
  say We are taking 10% off your cost for 2 sec
ten
set Bill to 0.9 * Bill
end
```

Checkout : Output

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

```scratch
say join Your bill is $Bill for 5 sec
ask How much cash are you giving us? and wait
set Cash to answer
```

Checkout : Output

- Calculate and announce change given back.

```scratch
say join Here is $Bill in change. Have a good day for 5 sec
```
Checkout: Output

- Calculate and announce change given back.

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 ....

Checkout: Output

- Calculate and announce change given back.

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

we should give them $20 back... Or Cash - Bill ...

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

II. Sometimes adjust bill for coupon

III. Ask for & get cash

IV. Tell change
Checkout: Handling the taxes

- Let's 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?

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

- Tell them if we are taxing them or not.
Checkout : Handling the taxes

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

Bill = ?

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?
  
  \[ \text{Bill} = \text{general equation?} \]

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?
  
  \[ \text{Bill} = 1.07 \times \text{Bill} \]

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:

\[ \text{if} \]
\[ \text{say} \ \text{You pay no taxes on food items for 2 secs} \]
\[ \text{else} \]
\[ \text{say} \ \text{We are charging you 7% sales tax for 2 secs} \]
\[ \text{set} \ \text{Bill to} \ \text{Bill} + 0.07 \times \text{Bill} \]

Reminder

Checkout: Handling the taxes

- Code so far:

\[ \text{if} \]
\[ \text{say} \ \text{You pay no taxes on food items for 2 secs} \]
\[ \text{else} \]
\[ \text{say} \ \text{We are charging you 7% sales tax for 2 secs} \]
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\[ \text{say} \ \text{You pay no taxes on food items for 2 secs} \]
\[ \text{else} \]
\[ \text{say} \ \text{We are charging you 7% sales tax for 2 secs} \]
\[ \text{set} \ \text{Bill to} \ \text{Bill} + 0.07 \times \text{Bill} \]

Reminder

Checkout: Handling the taxes

- Code so far:

\[ \text{let item to} \ \text{soda} \]
\[ \text{if} \]
\[ \text{say} \ \text{You pay no taxes on food items for 2 secs} \]
\[ \text{else} \]
\[ \text{say} \ \text{We are charging you 7% sales tax for 2 secs} \]
\[ \text{set} \ \text{Bill to} \ \text{Bill} + 0.07 \times \text{Bill} \]

Reminder
Checkout: Handling the taxes

- But more than what item has no tax.

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.

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

Build these larger conditions by placing smaller condition in these spots.
Quick Lesson: Logical Operators

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

- NOT reverses the smaller condition and vice versa.

- NOT is False if little condition is True.

- AND is only TRUE when both smaller conditions are TRUE, otherwise AND is FALSE.

- OR is only FALSE when both smaller conditions are FALSE, otherwise OR is TRUE.

- Example: Item is Apple and Weight is 500
  Is this True or False?

- 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?

  **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?

  ```
  if Item = 'food'
  say 'You pay no taxes on food items' for 2 secs
  else
  say 'We are changing you 7% sales tax' for 2 secs
  set Bill to 1.07 * Bill
  ```
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?

OR

Use more ORs if other non-tax items

Place this in our code after coupon handled.
Checkout: Handling the taxes

Checkout: Problems
- Too many decimal digits in bill.

TRICK:
- 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. 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

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

```python
If 1:
    Coupon?
If 2:
    Taxes?
If 3:
    Crook?
```

Checkout: Code without Problems

Demo: Checkout 4
Checkout: Multimedia Added

Demo: Checkout

- Stage

  Items For Sale:
  book, soda, cereal, sneakers, toy

Checkout: Multimedia Added

- Sprite costumes

Checkout: Multimedia Added

- Sounds

Checkout: Multimedia Added

- Script

Checkout: Multimedia Added

- Start

  when green flag clicked
  switch to costume "Start"
  go to (225, 225)
  ask "What item are you buying?" and wait
  get item to answer
  switch to costume "Start"
  ask "Do you want to pay and wait?"
  set bill to answer
  ask "Do you have the 15% off coupon (Y/N)?" and wait
  set coupon to answer
Checkout: Multimedia Added

- Start

  when green light clicked
  switch to costume start
  go to x: 200 y: 200
  ask "What item are you buying?"; and wait
  set item to answer
  switch to costume item
  ask "What is the price?" and wait
  set price to answer
  ask "Do you have the 10% off coupon (Y/N)?" and wait
  set coupon to answer

Question Mark

Checkout: Multimedia Added

- Start

  when green light clicked
  switch to costume start
  go to x: 216 y: 200
  ask "What item are you buying?"; and wait
  set item to answer
  switch to costume item
  ask "What is the price?" and wait
  set price to answer
  ask "Do you have the 10% off coupon (Y/N)?" and wait
  set coupon to answer

Position on left

Checkout: Multimedia Added

- Start

  when green light clicked
  switch to costume start
  go to x: 293 y: 200
  ask "What item are you buying?"; and wait
  set item to answer
  switch to costume item
  ask "What is the price?" and wait
  set price to answer
  ask "Do you have the 10% off coupon (Y/N)?" and wait
  set coupon to answer

Turn sprite into item

Checkout: Multimedia Added

- Start

  when green light clicked
  switch to costume start
  go to x: 248 y: 200
  ask "What item are you buying?"; and wait
  set item to answer
  switch to costume item
  ask "What is the price?" and wait
  set price to answer
  ask "Do you have the 10% off coupon (Y/N)?" and wait
  set coupon to answer

Turn sprite into item

NEW: actually using variable rather than picking from menu of costume names like we did in past code

Get price and find out if there is a coupon
Checkout: Multimedia Added

- **Fun Effects**
  - play sound `cashregister` until done
  - play sound `CONVEYOR`
  - glide 3 secs to x: 110 y: -89

  Play sound effects and show item moving down checkout aisle

- **Checkout: Multimedia Added**
  - **Coupon?**
    - if `Coupon = 1`
      - say "We are taking 10% off your cost for 2 secs"
      - set `Bill` to `0.9 * Bill`

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

- **Checkout: Multimedia Added**
  - **Taxes?**
    - if `Item = food or Item = snack`
      - say "You pay no taxes on food item for 2 secs"
    - else
      - say "We are charging you 7.5% sales tax for 2 secs"
      - set `Bill` to `Bill + 0.075 * Bill`

    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**
    - say "Your bill is $Bill for 5 secs"
    - ask "How much cash are you giving us? and wait"
    - set `Cash` to `answer`

    Tell person what the bill is and get their money.

- **Checkout: Multimedia Added**
  - **Change?**
    - if `Cash < Bill`
      - say "You are short $0.00 for 3 secs"
      - say "In change, have a good day! for 3 secs"
      - say "Add it up" for 3 secs
      - step up

    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

• Script

• Script

• Script

• Script

• Script
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