Piecewise Functions

@BootstrapWorld

Not every function is smooth

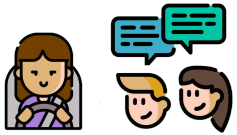
Boxes of candy cost $2 each. A graph of revenue-v-sales looks like a straight line with a slope of 2.

If there's a "bulk discount" where the price drops to $1 for the 21st box of candy and every box after that, the graph *is no longer a straight line!*

Instead, the line has a kink in it at 21 boxes, where the slope **suddenly changes from 2 to 1**.

Not every function is smooth

1. Save a copy, then click “Run”
2. Select a Driver
3. Complete **Welcome to Alice’s Restaurant** as a team
4. Select one person to be ready to share back your answers for the group!



Students browse: code.pyret.org/editor#share=1_TxgoUCDKY3WYn_Vu9J1_2LXkY1o0dx_

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Not every function is smooth

- What are some *familiar* things you noticed in this file?
- What *new* things did you notice in this file?
- What function was being defined there? What is its contract?
- How do you think this function works?

Students, write your response!

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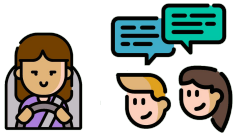
Defining Piecewise Functions

Complete **Alice's Restaurant - Explore**

Why do you get an error when you try to use the `sales-tax` function for an item that isn't on the menu?



Is it OK for a function to break it's own contract?

How can the Design Recipe help us define Piecewise Functions?

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Defining Piecewise Functions

Contract and Purpose Statement

Every contract has three parts...

```
# order :: String -> Number
```
function name / *domain* / *range*

```
# Consumes an item & produces price. Hamburger=$6, Onion Rings=$3.50,tofu=$5.25, pie=$2.25
```
what does the function do?

Examples

Write some examples, then circle and label what changes...

item

price

```
examples:
order ( "pie" ) is 2.25
order ( "hamburger" ) is 6.00
```
function name / *input(s)* / *what the function produces*

TWO things are changing???

Definition

Write the definition, giving variable names to all your input values...

```
fun order ( item ):
  ask:
    | item == "pie"       then: 2.25
    | item == "hamburger" then: 6.00
```
function name / *variable(s)*

Defining Piecewise Functions

Can you think of any situations in real life that can be modeled using a piecewise function?

Is "square root" a piecewise function? Why or Why not?

Is "absolute value" a piecewise function? Why or Why not?

Students, write your response!

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