Flags

@BootstrapWorld

Putting Images Together

As you've already seen, `overlay` sticks two images together, so that the *center* of the first image is placed exactly on top of the *center* of the second image. **But what if we want to put the dot somewhere besides the center?**

Putting Images Together

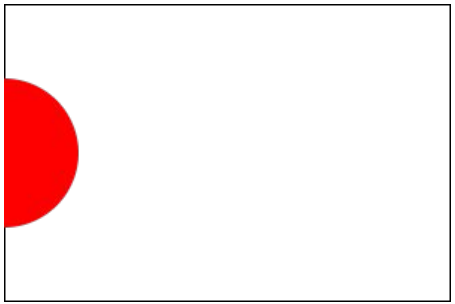
Think of the background image as a sheet of graph paper with the origin (0,0) in the bottom left corner.

The `put-image` function works like `overlay`, but the numbers in `put-image` specify a point on that graph paper where the center of the top image should be placed.

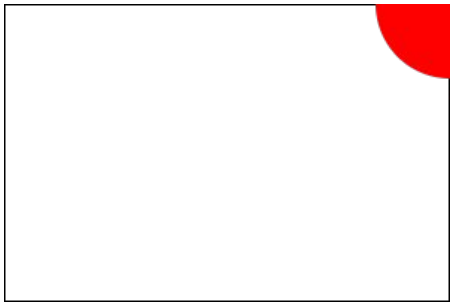
Putting Images Together

The width of the rectangle is 300 and height is 200. What coordinates for the `dot` would create each of the following images?

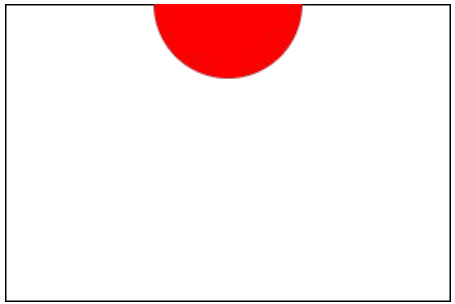
1



2



3



4

Fill in your answers on Estimating Coordinates.

Putting Images Together

You already know how to place one image on top of another, using the `overlay` function.

1. **Save a copy** of the Flags Starter File, and **click "Run"**.

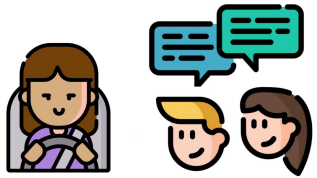
2. Evaluate `dot` and `background` in the Interactions Area. What do you get?

3. In the Interactions Area, use `overlay` to place the `dot` on top of the `background` rectangle image.

Putting Images Together

1. Open your saved Flags file, **click Run**, and type `japan-flag` into the Interactions Area. What do you get back?

2. Now type `japan` into the Interactions Area. What do you get back?

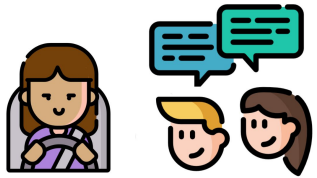


3. Look at the code and fix it so that the images created by `japan-flag` and `japan` match.

4. Write the Contract for `put-image` in your Contracts page.

Putting Images Together

1. Open the Flags of Netherlands, Ireland & Mauritius.
2. Looking at the code, how big is the Netherlands' flag?
3. What was the programmer thinking when she coded the height of the red stripe as 200 / 3?
4. The center of the blue stripe is placed at (150, 200 / 6).
   a. How did the programmer know to use 150 as the x-coordinate?
   b. What was the programmer thinking when she coded the y-coordinate as 200 / 6?
5. Explain the thinking behind coding the redstripe's y-coordinate as 5 * (200 / 6).



Putting Images Together

Could we completely replace `overlay` with `put-image`? Why or why not?

Students, write your response!

Making Flags

1) **Decompose the Image -** We observe that the Japanese flag is made up of two simpler images: a blank rectangle and a red dot.

2) **Define those parts -** We define `dot` and `background`. Once we've defined those images, we test them out in the Interactions Area to make sure they look right!

3) **Find the Coordinates -** For each image, we calculate what the x- and y-coordinates of the center should be. *TIP: this is a lot easier if you have a sheet of graph paper handy!*

4) **Build the Image -** We stack the parts on top of the bottom image using the coordinates we found.

Making Flags

1. Complete **Decomposing Flags** in your Student Workbook, repeating these steps to make a flag.

2. When you're done, open your saved Flags Starter File and write the code to build that flag!

Making Flags

Which flags were the easiest to make?

The hardest?

Why is it useful to define each part of the flag first, before stitching them together?

Additional Exercises

- For a quick dive into why it's more efficient to define shapes before building the image, open the Alaska Flag Starter Code.
- For practice scaling imported graphics, open the Flag of Lebanon Starter Code
- For practice with composing more complex images, fix this Code for the Puerto Rican flag
- If you've already studied Pythagorean Theorem and are ready to apply it, open the Flag of Trinidad and Tobago Starter Code