

Issue #16796

Add Checkboxes to Legend Controlling Subplot Visibility

<https://github.com/matplotlib/matplotlib/issues/16796>

Why we changed our implementation plan

We changed our implementation because after showing our idea to the matplotlib developers, they asked us to implement the feature as an example instead of as part of the API. This was because some backends are not interactive, this means the feature wouldn't work for all users and therefore shouldn't be included in the default API.

How it is different for users

The only difference this makes to the user is that they will have to download our example and run the function in it to use the interactive legend instead of just an additional argument in the legend object's init function.

Feature Description

The feature is being able to initialize the legend with the ability to add interactive checkboxes that turn the visibility of the subplots on/off. Users can add the interactive checkboxes to the legend by directly calling the method `make_legend_interactive(legend)`, where they pass in the legend that they want to make interactive. If the legend is interactive, clicking the checkboxes will toggle the visibility of their respective elements on/off. Lastly, it will get all of the entries in the legend (including bars and lines).

Implementation

Code Organization

- Checkbox
 - This will be the GUI element objects for the checkboxes. One instance is created for every entry and will save its own state on/off, and it will know which object it is referencing and will store its own event handler, cid, so if the entry is deleted, the event can also be deleted.
 - It will inherit from Artist.

- In the init function, an event handler will be created to respond to the users clicking on the checkbox.
 - It will be represented by images for the checked checkbox and the unchecked checkbox depending on its state.
 - Calls the respective set visibility methods of the artist elements.
- `make_legend_interactive(legend)`
 - It is a global function in the same file that the checkbox class is in, so that the users can directly call it to make the legend interactive.
 - It takes in a legend and then makes the corresponding checkboxes for each of the entries in the legend.

Requirements

- Learn how to add a new GUI object.
 - Intricacies with drawing may be trivial.
 - How to store pictures and make the picture interactive (clickable).
- Learn how to add the checkboxes (modify the legend).
- Learn how to get all of the entries in the legend (entries and corresponding elements).
 - E.g. Get both the lines and bars in the graph.

Diagram

