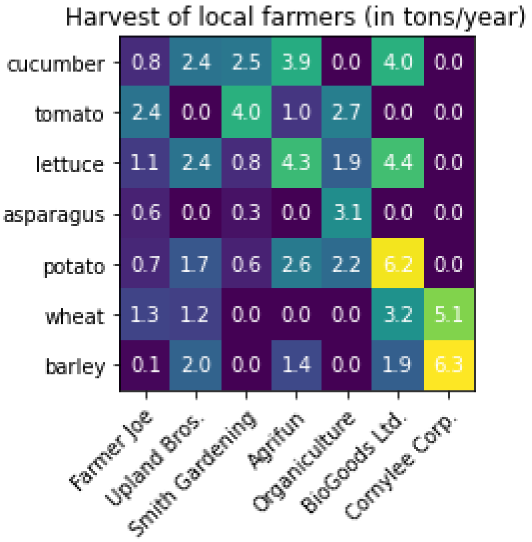
In [1]:

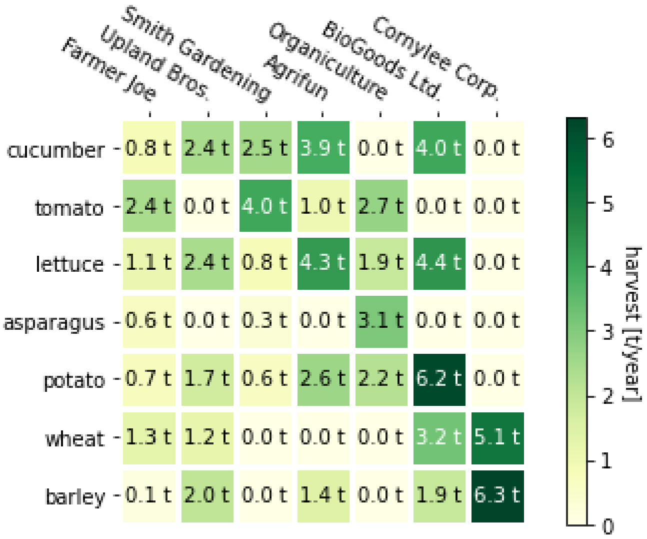
```
import numpy as np
import matplotlib
import matplotlib.pyplot as plt

vegetables = ["cucumber", "tomato", "lettuce", "asparagus",
              "potato", "wheat", "barley"]
farmers = ["Farmer Joe", "Upland Bros.", "Smith Gardening",
           "Agrifun", "Organiculture", "BioGoods Ltd.", "Cornylee Corp."]

harvest = np.array([[0.8, 2.4, 2.5, 3.9, 0.0, 4.0, 0.0],
                    [2.4, 0.0, 4.0, 1.0, 2.7, 0.0, 0.0],
                    [1.1, 2.4, 0.8, 4.3, 1.9, 4.4, 0.0],
                    [0.6, 0.0, 0.3, 0.0, 3.1, 0.0, 0.0],
                    [0.7, 1.7, 0.6, 2.6, 2.2, 6.2, 0.0],
                    [1.3, 1.2, 0.0, 0.0, 0.0, 3.2, 5.1],
                    [0.1, 2.0, 0.0, 1.4, 0.0, 1.9, 6.3]])


fig, ax = plt.subplots()
im = ax.imshow(harvest)

# We want to show all ticks...
ax.set_xticks(np.arange(len(farmers)))
ax.set_yticks(np.arange(len(vegetables)))
# ... and label them with the respective list entries
ax.set_xticklabels(farmers)
ax.set_yticklabels(vegetables)

# Rotate the tick labels and set their alignment.
plt.setp(ax.get_xticklabels(), rotation=45, ha="right",
         rotation_mode="anchor")

# Loop over data dimensions and create text annotations.
for i in range(len(vegetables)):
    for j in range(len(farmers)):
        text = ax.text(j, i, harvest[i, j],
                       ha="center", va="center", color="w")

ax.set_title("Harvest of local farmers (in tons/year)")
fig.tight_layout()
plt.show()
```



In [5]:

```
fig, ax = plt.subplots()
```

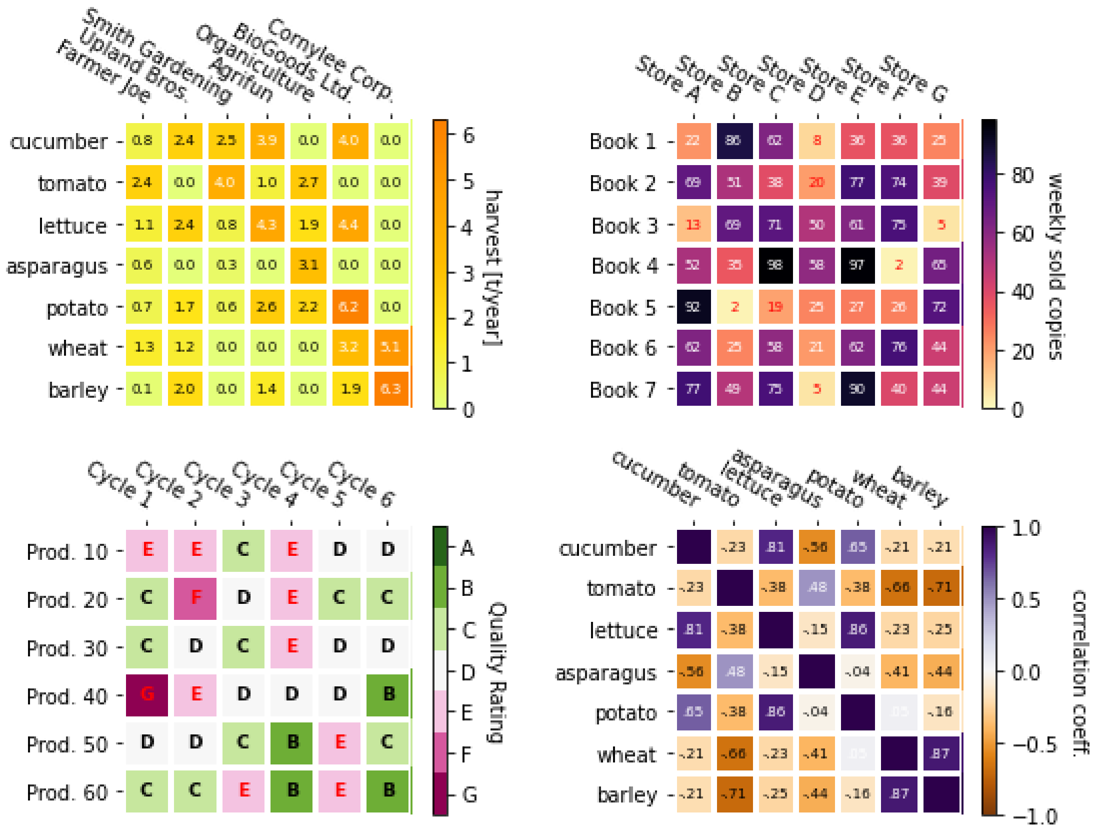
```
im, cbar = heatmap(harvest, vegetables, farmers, ax=ax,
                   cmap="YlGn", cbarlabel="harvest [t/year]")
texts = annotate_heatmap(im, valfmt="{x:.1f} t")

fig.tight_layout()
plt.show()
```



In [6]:

```
np.random.seed(19680801)

fig, ((ax, ax2), (ax3, ax4)) = plt.subplots(2, 2, figsize=(8, 6))

# Replicate the above example with a different font size and colormap.

im, _ = heatmap(harvest, vegetables, farmers, ax=ax,
                cmap="Wistia", cbarlabel="harvest [t/year]")
annotate_heatmap(im, valfmt="{x:.1f}", size=7)

# Create some new data, give further arguments to imshow (vmin),
# use an integer format on the annotations and provide some colors.

data = np.random.randint(2, 100, size=(7, 7))
y = ["Book {}".format(i) for i in range(1, 8)]
x = ["Store {}".format(i) for i in list("ABCDEFG")]
im, _ = heatmap(data, y, x, ax=ax2, vmin=0,
                cmap="magma_r", cbarlabel="weekly sold copies")
annotate_heatmap(im, valfmt="{x:d}", size=7, threshold=20,
                 textcolors=("red", "white"))

# Sometimes even the data itself is categorical. Here we use a
# `matplotlib.colors.BoundaryNorm` to get the data into classes
# and use this to colorize the plot, but also to obtain the class
# labels from an array of classes.

data = np.random.randn(6, 6)
y = ["Prod. {}".format(i) for i in range(10, 70, 10)]
x = ["Cycle {}".format(i) for i in range(1, 7)]

qrates = list("ABCDEFG")
norm = matplotlib.colors.BoundaryNorm(np.linspace(-3.5, 3.5, 8), 7)
fmt = matplotlib.ticker.FuncFormatter(lambda x, pos: qrates[::-1][norm(x)])

im, _ = heatmap(data, y, x, ax=ax3,
                cmap=plt.get_cmap("PiYG", 7), norm=norm,
                cbar_kw=dict(ticks=np.arange(-3, 4), format=fmt),
                cbarlabel="Quality Rating")
```

```
annotate_heatmap(im, valfmt=fmt, size=9, fontweight="bold", threshold=-1,
                 textcolors=("red", "black"))

# We can nicely plot a correlation matrix. Since this is bound by -1 and 1,
# we use those as vmin and vmax. We may also remove leading zeros and hide
# the diagonal elements (which are all 1) by using a
# `matplotlib.ticker.FuncFormatter`.

corr_matrix = np.corrcoef(harvest)
im, _ = heatmap(corr_matrix, vegetables, vegetables, ax=ax4,
                cmap="PuOr", vmin=-1, vmax=1,
                cbarlabel="correlation coeff.")


def func(x, pos):
    return "{:.2f}".format(x).replace("0.", ".").replace("1.00", "")

annotate_heatmap(im, valfmt=matplotlib.ticker.FuncFormatter(func), size=7)


plt.tight_layout()
plt.show()
```



In [ ]: