

## Lab 4: Plotting with matplotlib and scipy

Due date: Thursday Feb 12, 11:59pm

The task is to construct a plot that shows the distribution of  $x$  and  $y$  in a contour or density plot (for example use matplotlib with `hist2d`) and show the marginal histograms of the  $x$  and  $y$  values. See Figure 1

- Generate 5000 random  $X$  values that come from a Normal distribution with mean 10 and standard deviation of 20, generate 5000  $Y$  values that come from a gamma distribution with  $\alpha=5$ , and  $\beta=2$ .
- Generate a density histogram of the  $X,Y$  coordinates, there are several way possible, for example use `hist2d` or kernel density smooting.
- generate histograms for  $X$  and  $Y$ , these are the marginal distributions.
- generate a plot that has on the top or bottom side of the  $X/Y$  density plot the  $X$  marginals and on the left or right side of the  $X/Y$  density plot the  $Y$  marginals.
- use a different color scheme than the default, the figure is only an example do not copy it.
- Create the combined plot using `subplot`.

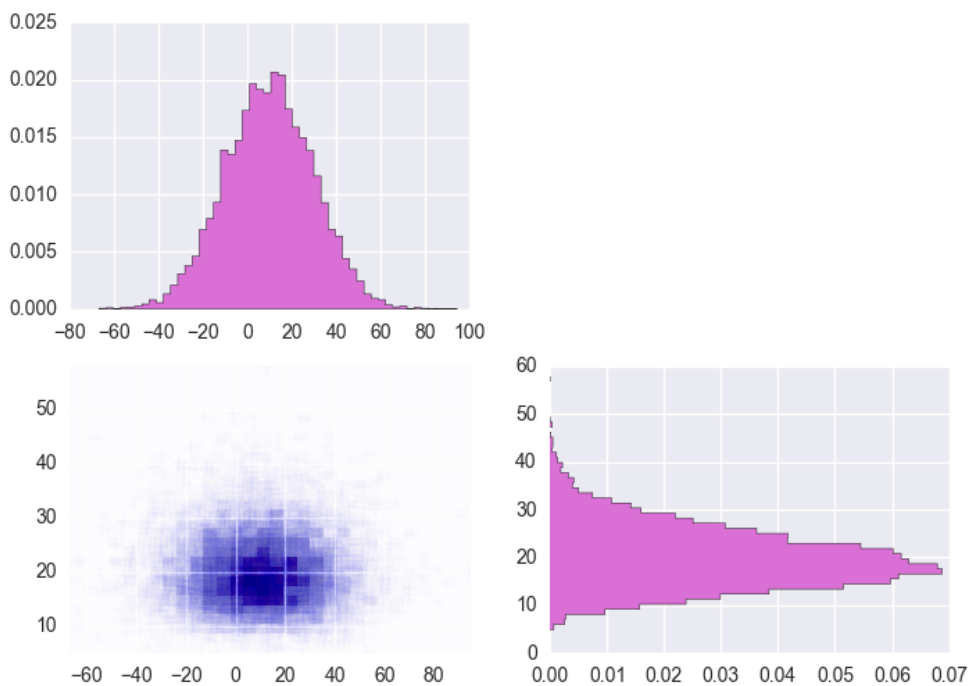


Figure 1: Figure that shows data that was drawn from two distributions, one for  $x$  and one for  $y$  coordinates with the marginal distributions.