# Pattern Recognition
Exercise set 1

1. Warming up with Python/Matlab

   - Load data `bogus_student_data.txt`.
   - Visualize the distribution of the final grades. Visualize the connection between exercises done and points earned in the exam. What conclusions could you draw from these plots? Use package `matplotlib` if you are using Python.
   - Compute the mean and standard deviation (std) of exercise points over all observations. Then compute mean and std. per grade (i.e. one mean/std for students who gained grade 0, one for students who gained 1, ...).
   - Can you reliably tell if student is going to get grade 5 or grade 0 by looking at the amount of done exercise alone? What would be the amount of points exercise points when you could say the student will get grade 5? Repeat this for grades 4 and 5. Tip: Lecture notes and examples with fish.

2. Given the normal data illustrated in figure on left, generate ten circle detectors using the negative selection algorithm. You are free to choose the sizes of these detectors. The lower and upper limits of the data are 0 and 1, respectively. Show your detectors in the same figure. An example of the detectors is given in the figure on right. The normal data is saved in `Normal_Data.mat`. You can use `scipy.io.loadmat` to load Matlab `.mat` files on Python.
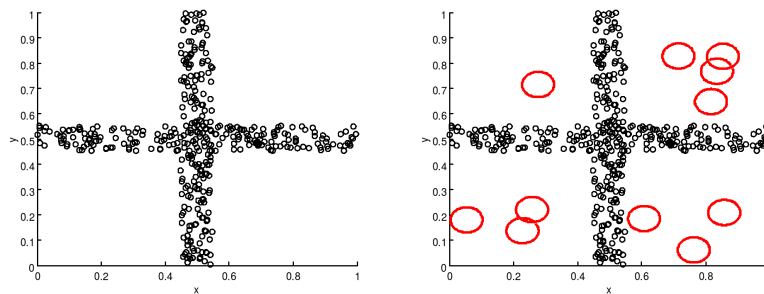
Submit your answers to Moodle by Sunday 31.3 23:55. Note different deadline.
Return your answers as one archive file (zip or tar), which should contain

1. A PDF file `answers.pdf`, containing your answers and output of your code (no program code. Include your full name and student ID)

2. Code file `main.py` or `main.m`. Running this file should output results for all exercises you did. You can use either Python or Matlab to do the exercises.

3. Required files to run the code (e.g. additional pieces of code, datasets)

On the scoring of the exercises: Exercises from each week will have equal weight on the final points from exercises.