Problem definition:

Body fat percentage is a highly observed metric in the world of sports and fitness. The overall physical condition of a person relies in part on how much body fat he/she has out of their total weight. Now there are several modern tools for evaluating this metric from just standing on a scale or holding some sensors in your arms, but they are yet to be cheap enough to reach the general public. What we are trying to do is to predict a person’s body fat percentage based on some easy-to-get measurements such as weight, height, circumference of several body parts and density measured by underwater weighing.

Problem specification:

* Input data:

1. Density – a floating number between 0 and 2 denoting the density of the whole body
2. Age – integer from 0 to 100
3. Weight - (in pounds) integer from 0 to 500
4. Height – (in inches) floating number from 0 to 100
5. Neck circumference – (in centimeters) floating number from 0 to 200
6. Chest circumference – (in centimeters) floating number from 0 to 200
7. Abdomen circumference – (in centimeters) floating number from 0 to 200
8. Hip circumference – (in centimeters) floating number from 0 to 200
9. Tigh circumference – (in centimeters) floating number from 0 to 200
10. Knee circumference – (in centimeters) floating number from 0 to 200
11. Ankle circumference – (in centimeters) floating number from 0 to 200
12. Biceps circumference – (in centimeters) floating number from 0 to 200
13. Forearm circumference – (in centimeters) floating number from 0 to 200
14. Wrist circumference – (in centimeters) floating number from 0 to 200

* Output data:

Body fat percentage – a floating number from 0 to 100

Specification of the learning task:

The task is to guess the body fat percentage based on the given inputs.

The performance is evaluated by how small is the difference between the predicted output and the actual percentage.

The experience is the collection of the previously predicted percentages.

Target function to be learned:

The mapping between the inputs and their relevance towards predicting the body fat percentage of the person whose metrics we have collected.