Goals

This week's goals build on top of **Theme 1.3**, that reads:

> We will start implementing algorithms into city-learn or different simulators and evaluate the performance for each algorithms.

Throughout the course of our project, we noticed that the time it would take for conventional algorithms to achieve an acceptable performance for our problem is prohibitively large. There's a reason for this: Learning requires seeing information over and over again. In the case of energy management, this means you need to see many summers, and many winters. As a consequence, learning can be a very slow process. Indeed, it can be too slow to be of any practical interest. We therefore need to speed up this learning process. In very broad terms (I'll be more specific in a minute) the goal of this week is to explore one approach that, given our current understanding, should be able to speed up the learning process. This approach is called meta-reinforcement learning.

Meta-reinforcement learning is when an agent has learned a similar problem before, and has therefore learned *how to learn*, so it can learn faster.

There are two "flavors" of meta reinforcement-learning: Model-Agnostic Meta-Learning (MAML) and Probabilistic Embeddings for Actor-Critic Meta Learning (PEARL). We will construct an agent that learns under either such paradigms, and evaluate whether it is capable of learning faster than an agent trained in a traditional approach (i.e. without meta-learning of any kind)

These considerations based on our project is currently standing, leads to the following goals for next week:

1. To study and to learn about Meta-Learning, from general concepts to the specifics of the MAML and PEARL approaches;
2. To experiment with the *garage* package in Python, that allows you to implement MAML and PEARL meta-reinforcement learning algorithms;
3. After completing goals 1 and 2, to figure out how we could use "MAML/PEARL + Garage" to accelerate the learning process, thus tying up these goals with Theme 1.3.