Assignment #2

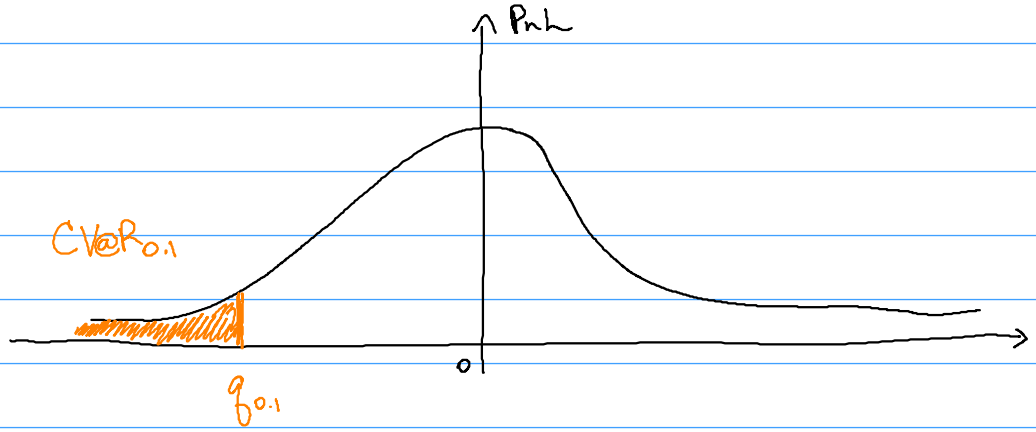
ANN: $f^{\theta} : \mathcal{X} \to \mathbb{R}$

$\mathcal{X}$: What could be the features? e.g. time, price, asset path, etc.

$\mathbb{R}$: hedges

Q. (ii)

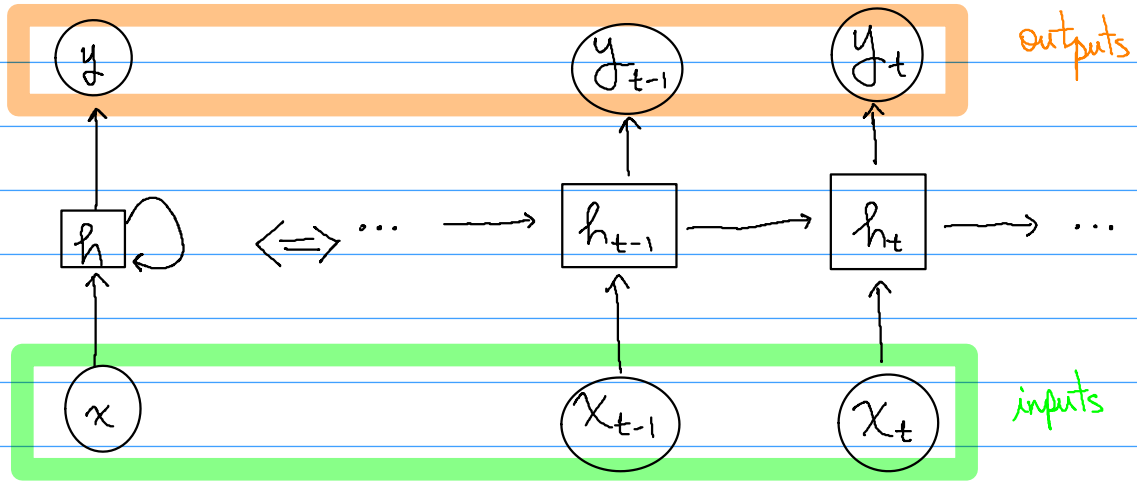
Q. (i) What structures we could use for the ANN, and what are the differences when comparing them? e.g. # nodes, # layers, layer structure, etc.



$$CVaR_{0.1} := \mathbb{E}\left[Pnl \mid Pnl \leq q_{0.1} \right]$$

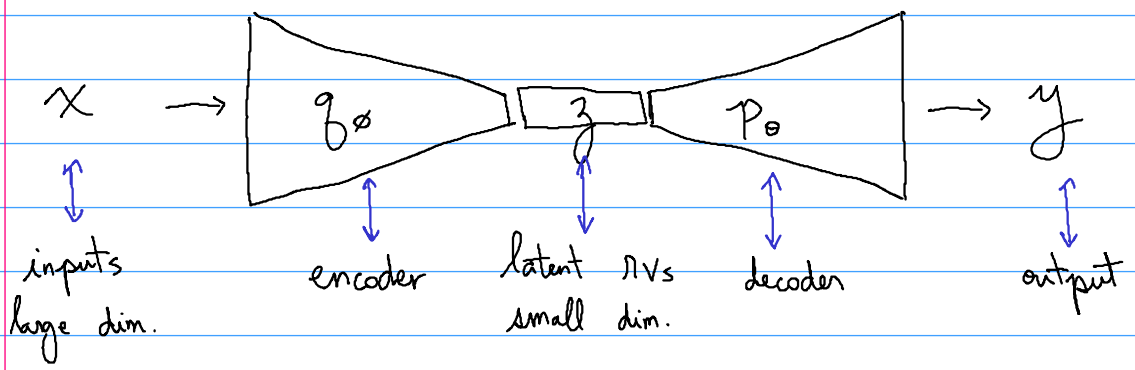
Recurrent Neural Networks (RNNs)

- Class of ANNs, useful when dealing with temporal sequences.



- Different formats for the layer, e.g.
  - → Long-short term memory (LSTM)
  - → Gated recurrent unit (GRU).

Variational autoencoders (VAEs)



- Encoder: $q(z|x,\phi) \sim N\left(\mu^{\phi}(x); \Sigma^{\phi}(x)\right)$.
- Decoder: $p(x|z,\theta) \sim N\left(\mu^{\theta}(z); \Sigma^{\theta}(z)\right)$.
- We use ANNs parametrized by ϕ and θ.
- Evidence lower bound (ELBO).