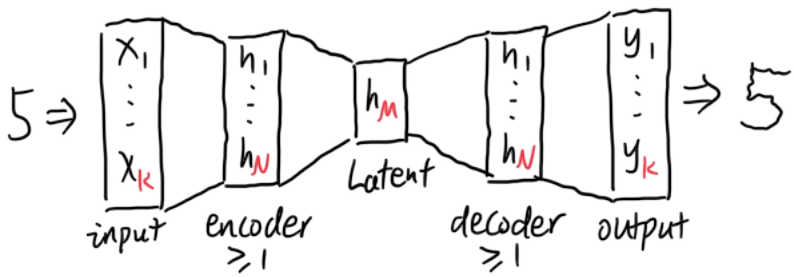
16) Autoencoder

FFN-AE

- a DL model that teaches itself how to encode information

- **architecture**:

Layer sizes:
$K > N > M$



- Goal: learn a compressed, efficient representation of input data
- Loss function: MSE

- **Application**:

① Reduce dimensionality of data to Latent space ② Denoise data

③ Reconstruct data from occlusion (computer vision)

Tying Weights

- Duplicate weight matrices from 1 layer to another

- **How?**: Denote `nn.Parameter(torch.randn(out_feature, in_feature))` as W

  Compute XW^T for from_encoder & XW for to_decoder

- **Pros & Cons**: ① Fewer params to train / Less overfitting ② lower performance