Encoder – Decoder Model

What is Encoder – Decoder Model?

Encoder - Decoder model is a **Machine Learning model** comprising of **two learning components (two neural networks in this context) called Encoder and Decoder.**

The first network works normally, and the second network works in reverse manner

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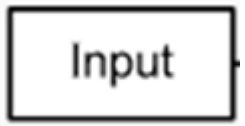

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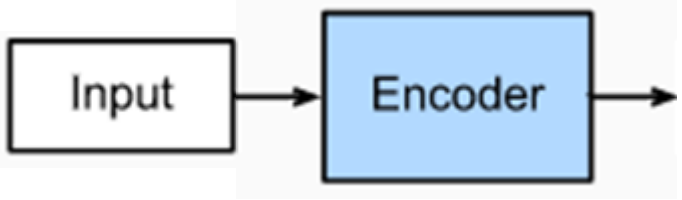

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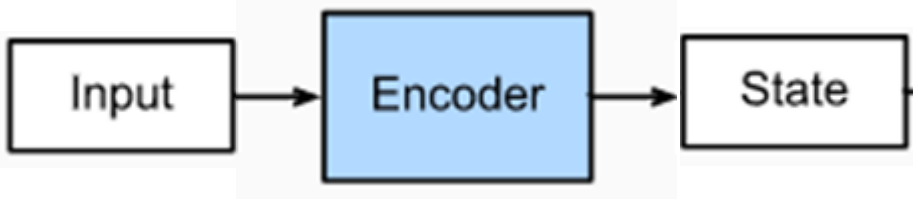

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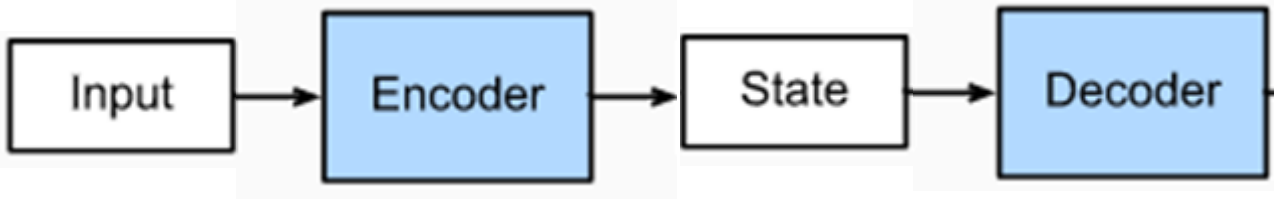

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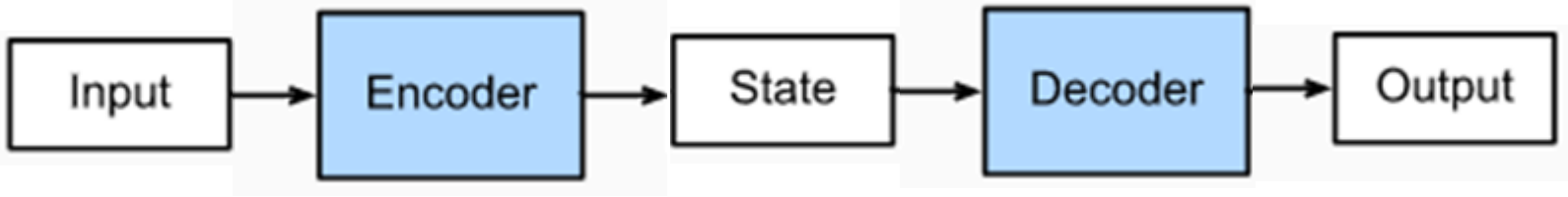

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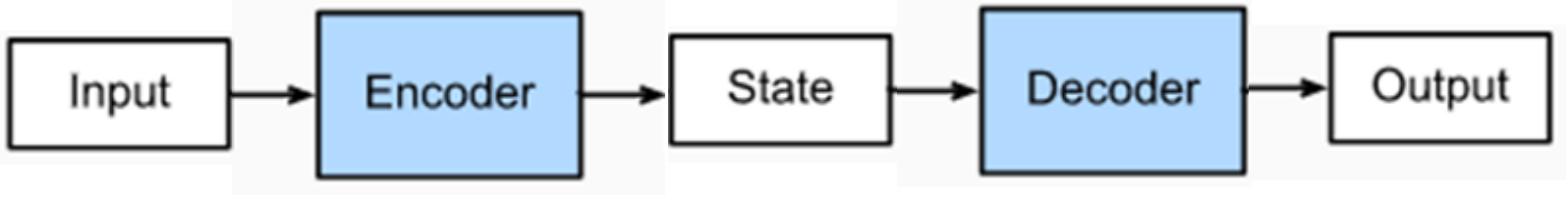

x $z = g(x)$ z $y = f(x)$ y

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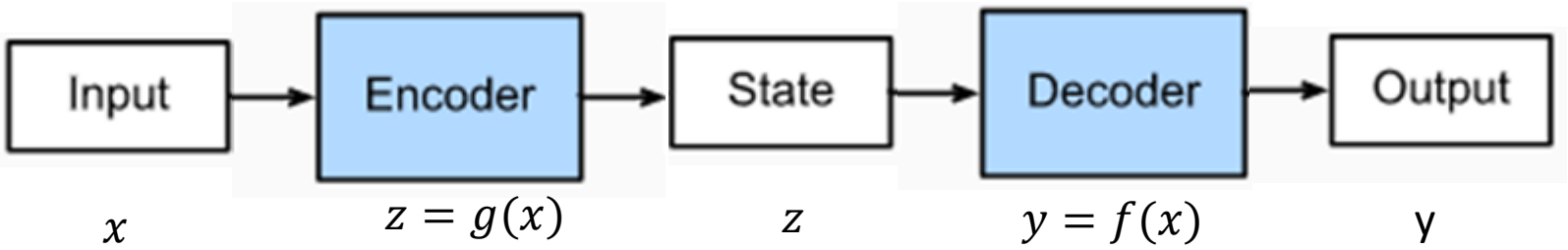
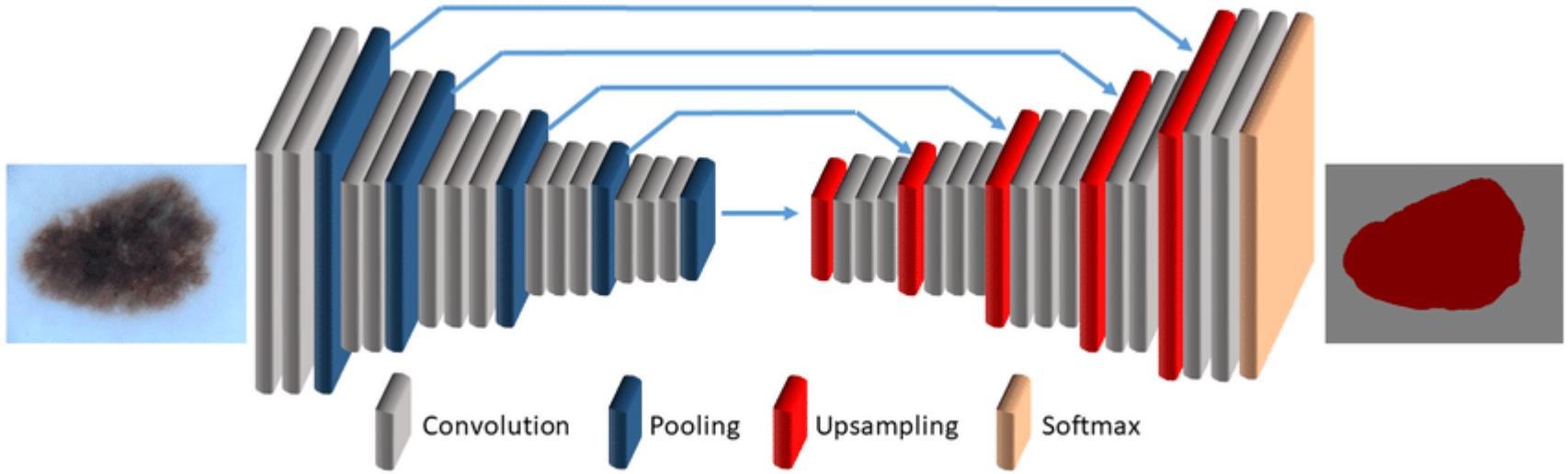


$x = f(g(x))$ **Lossless:** No information is loss

$x \neq f(g(x))$ **Lossy:** Some information is loss

An example



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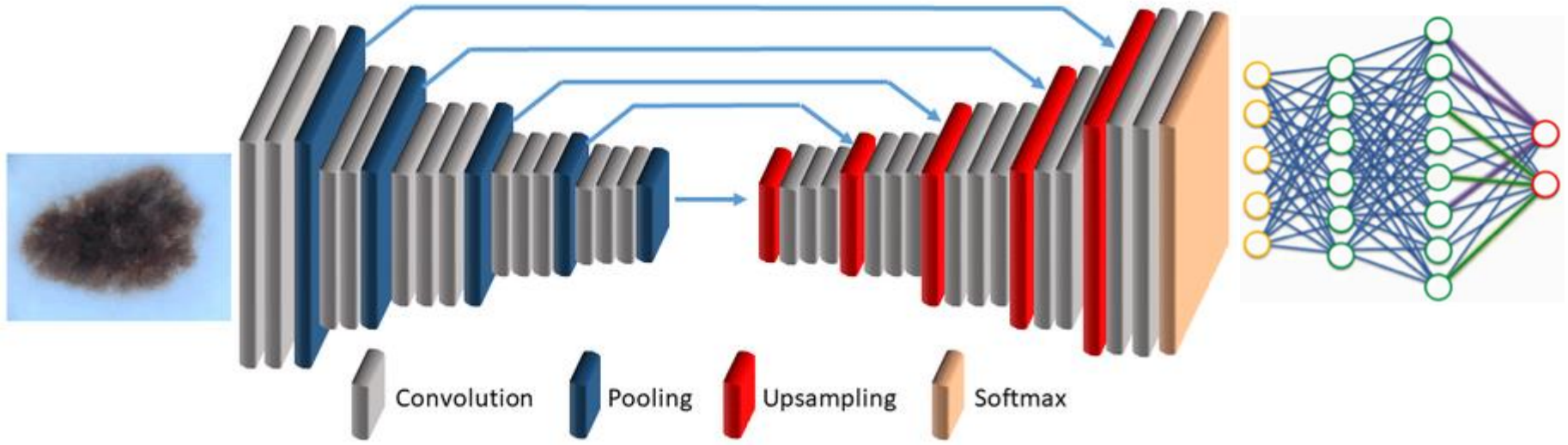
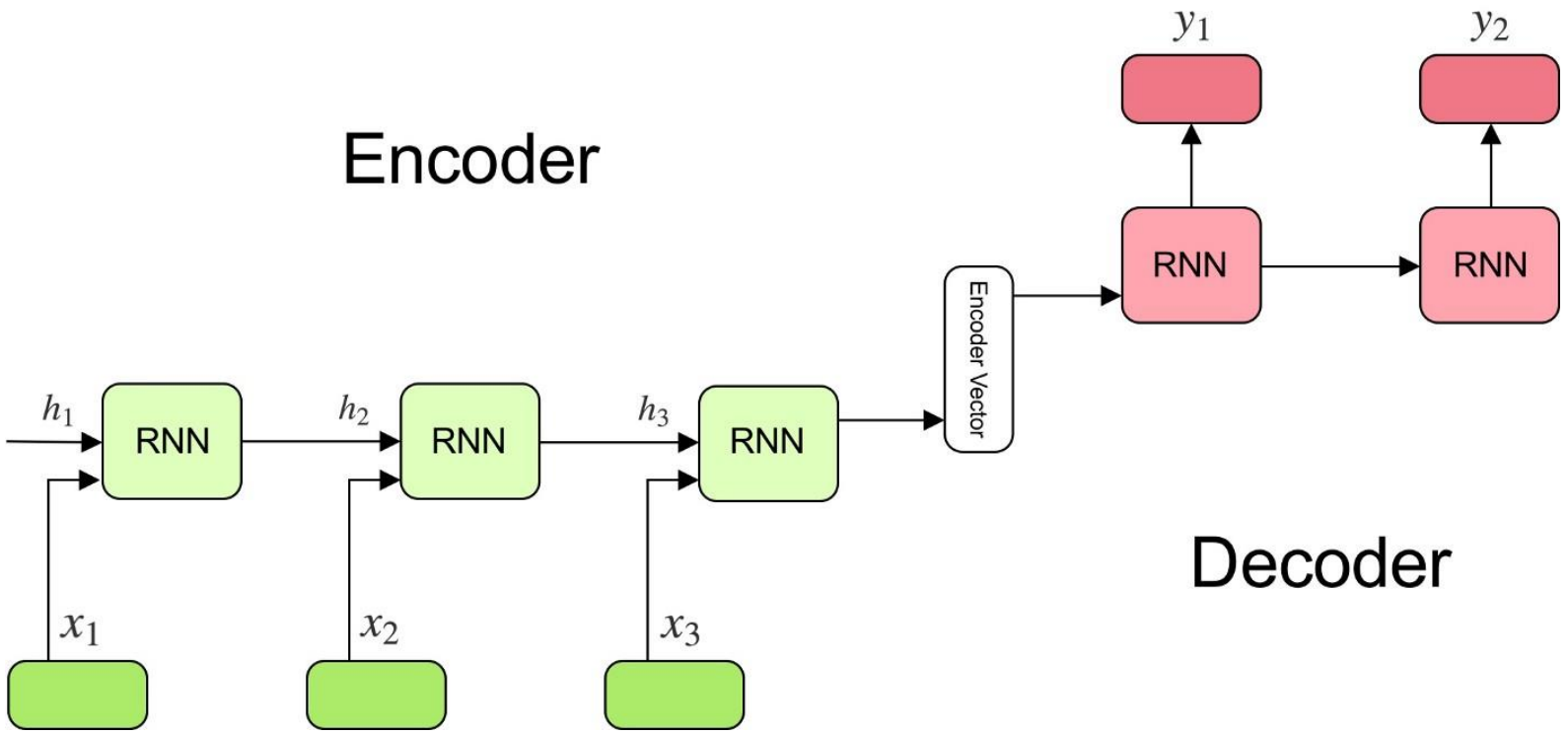
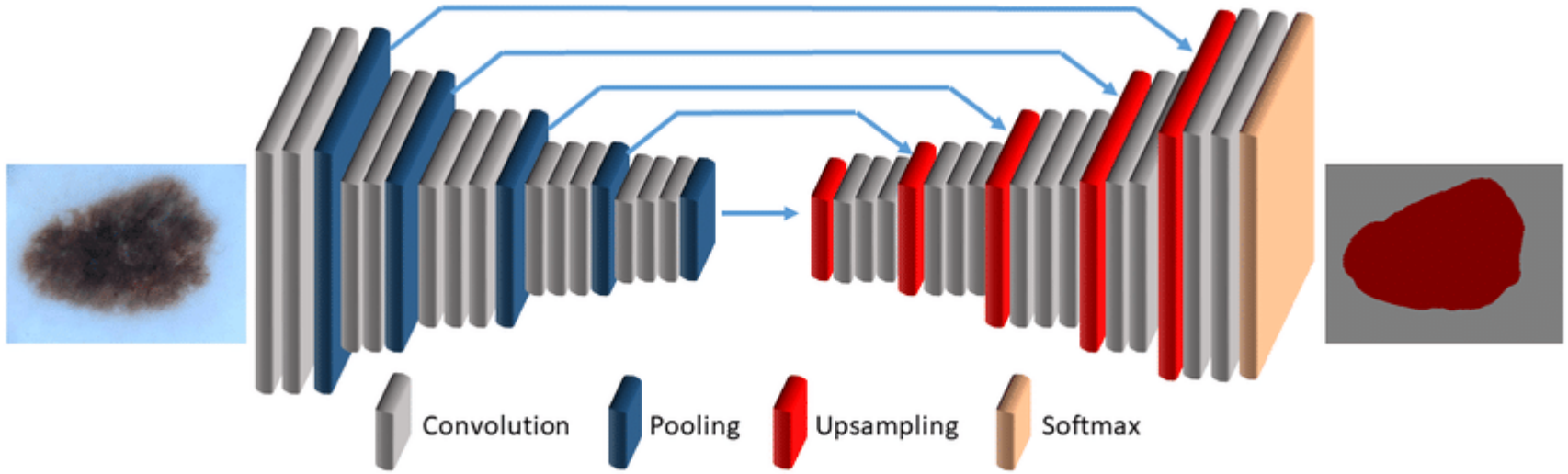


Different Forms of Encoder-Decoder Models

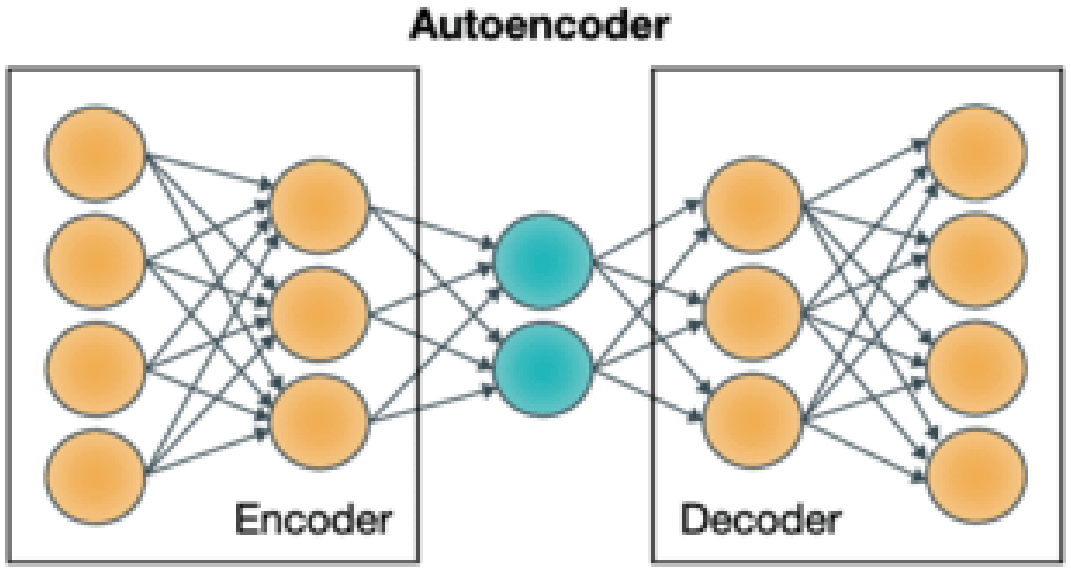
Homogeneous Model: Sequential



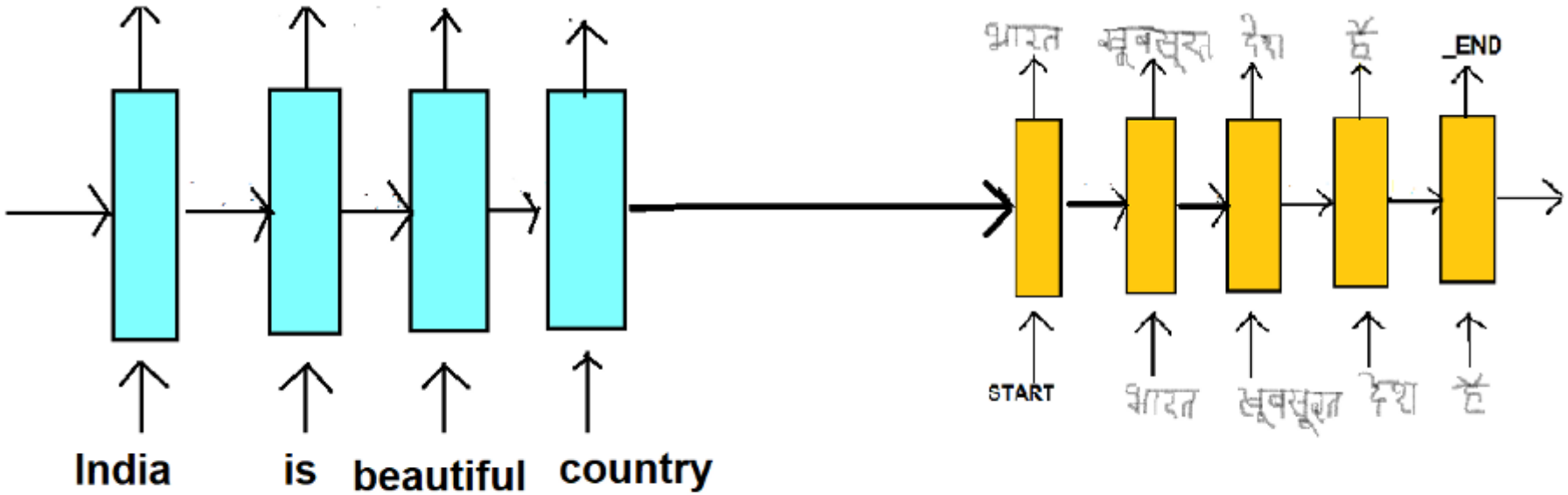
Homogeneous Model: CNN



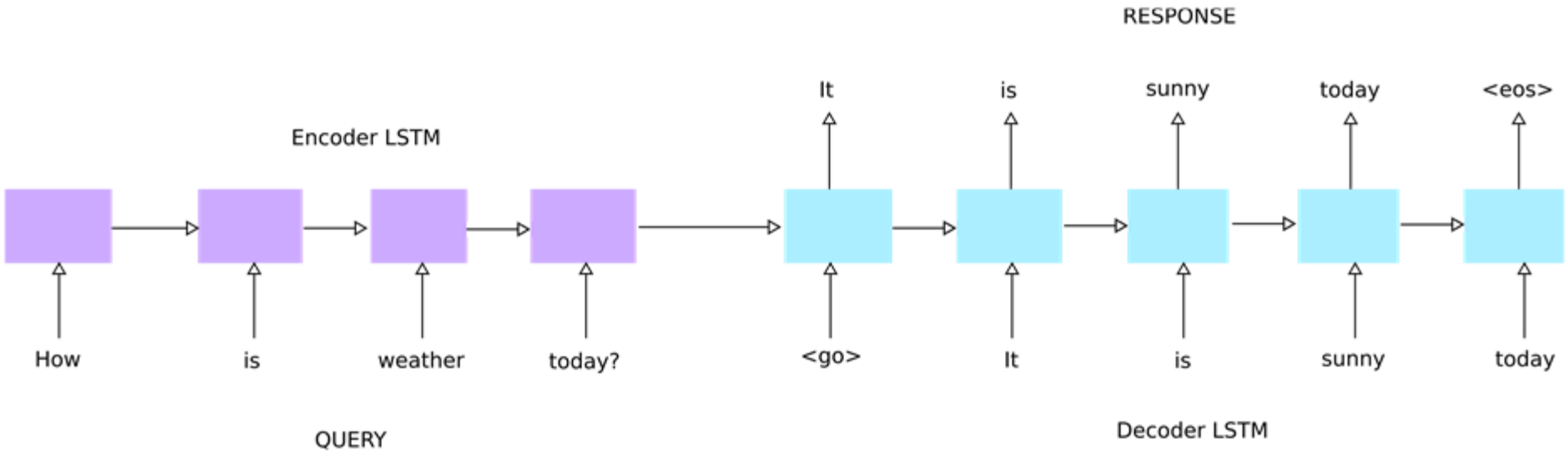
Homogeneous Model: MLP



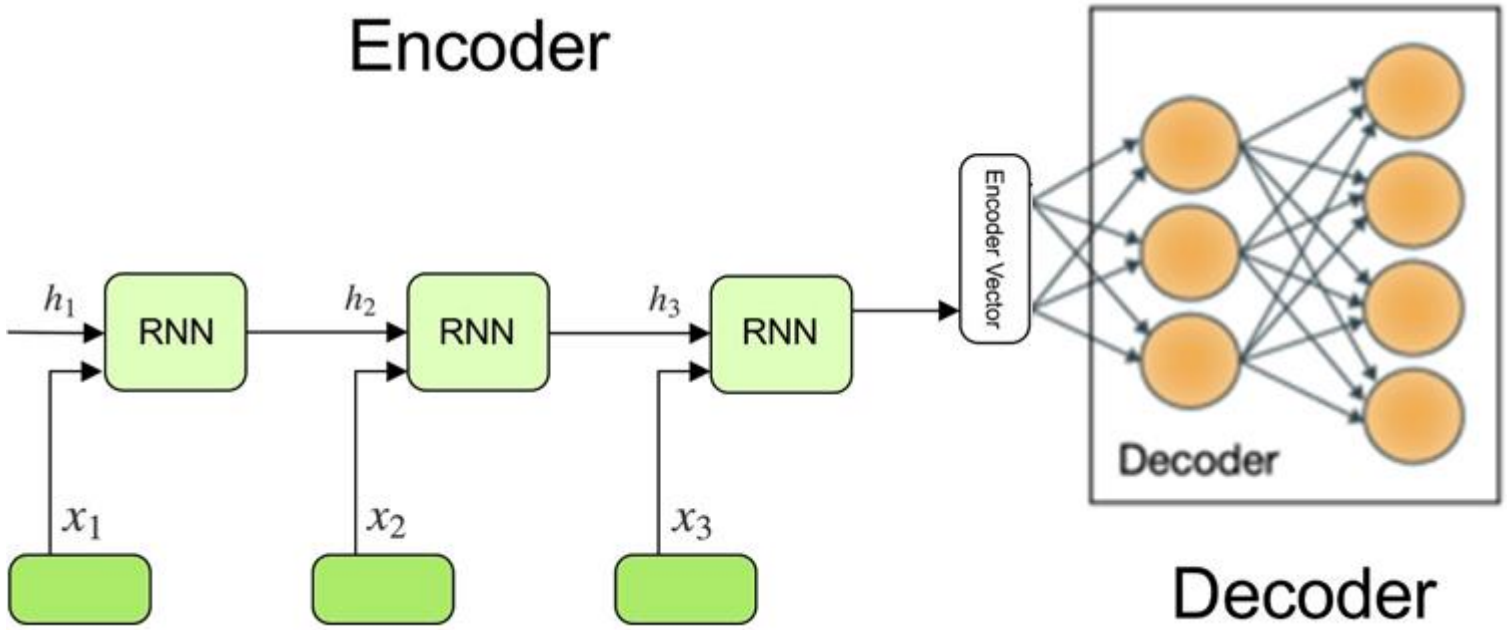
Machine Transliteration



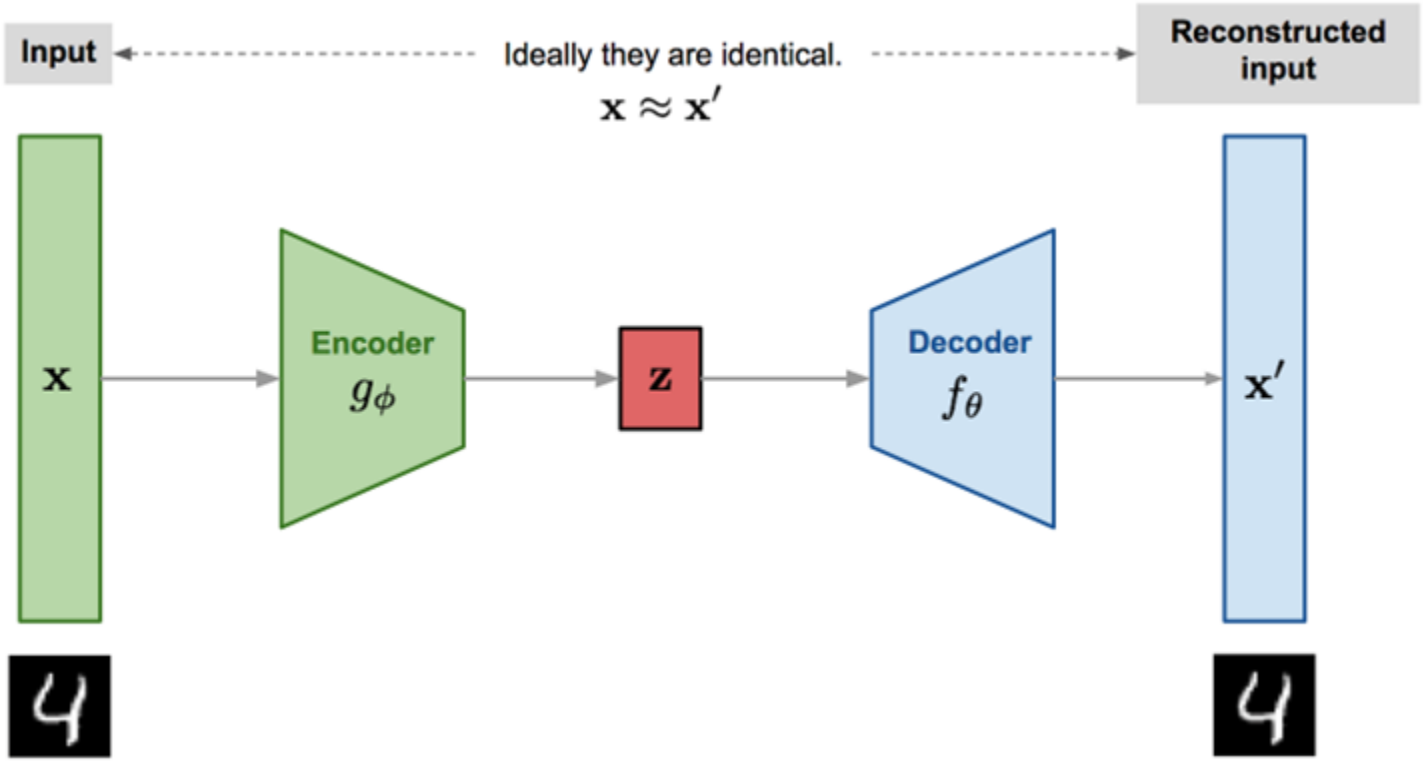
Question Answering



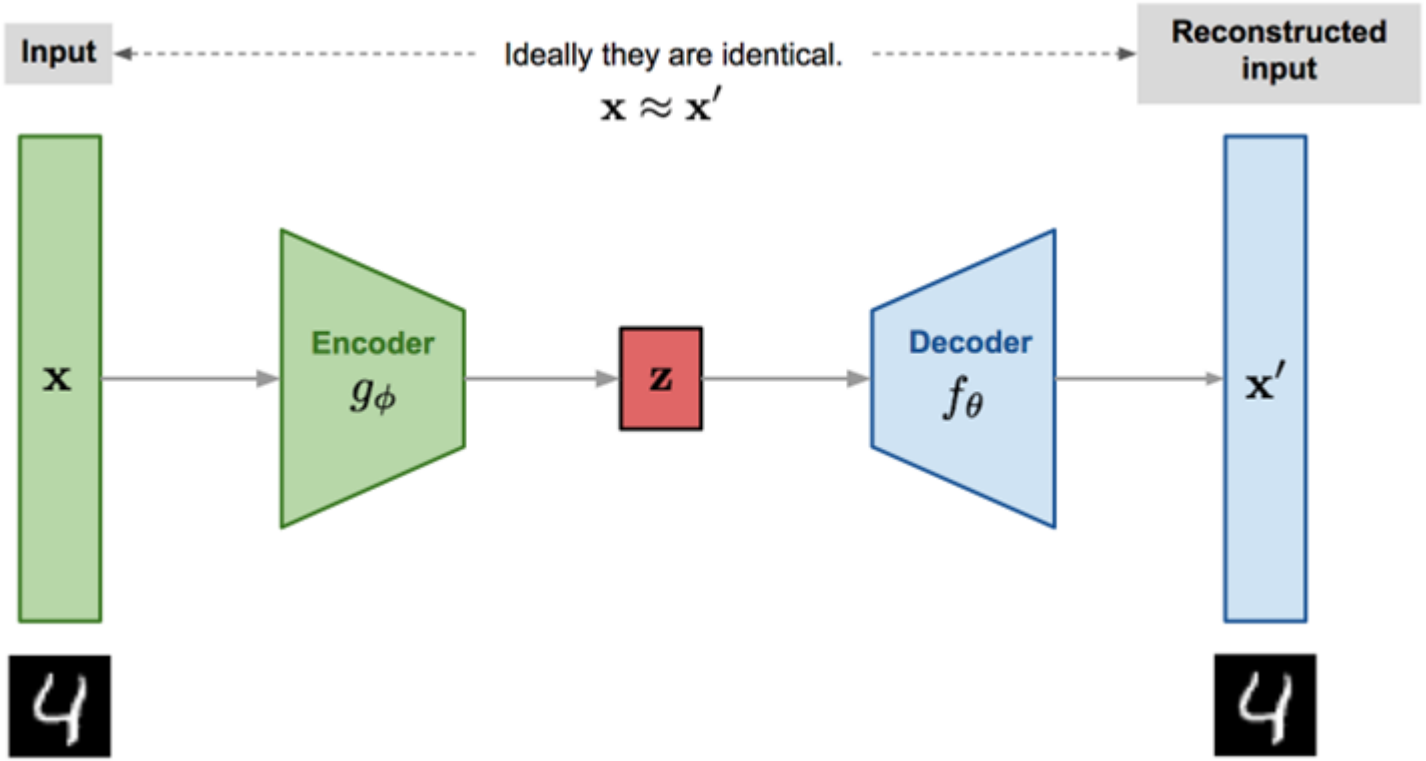
Heterogeneous Model



Auto-Encoder



Auto-Encoder – Dimensionality Reduction



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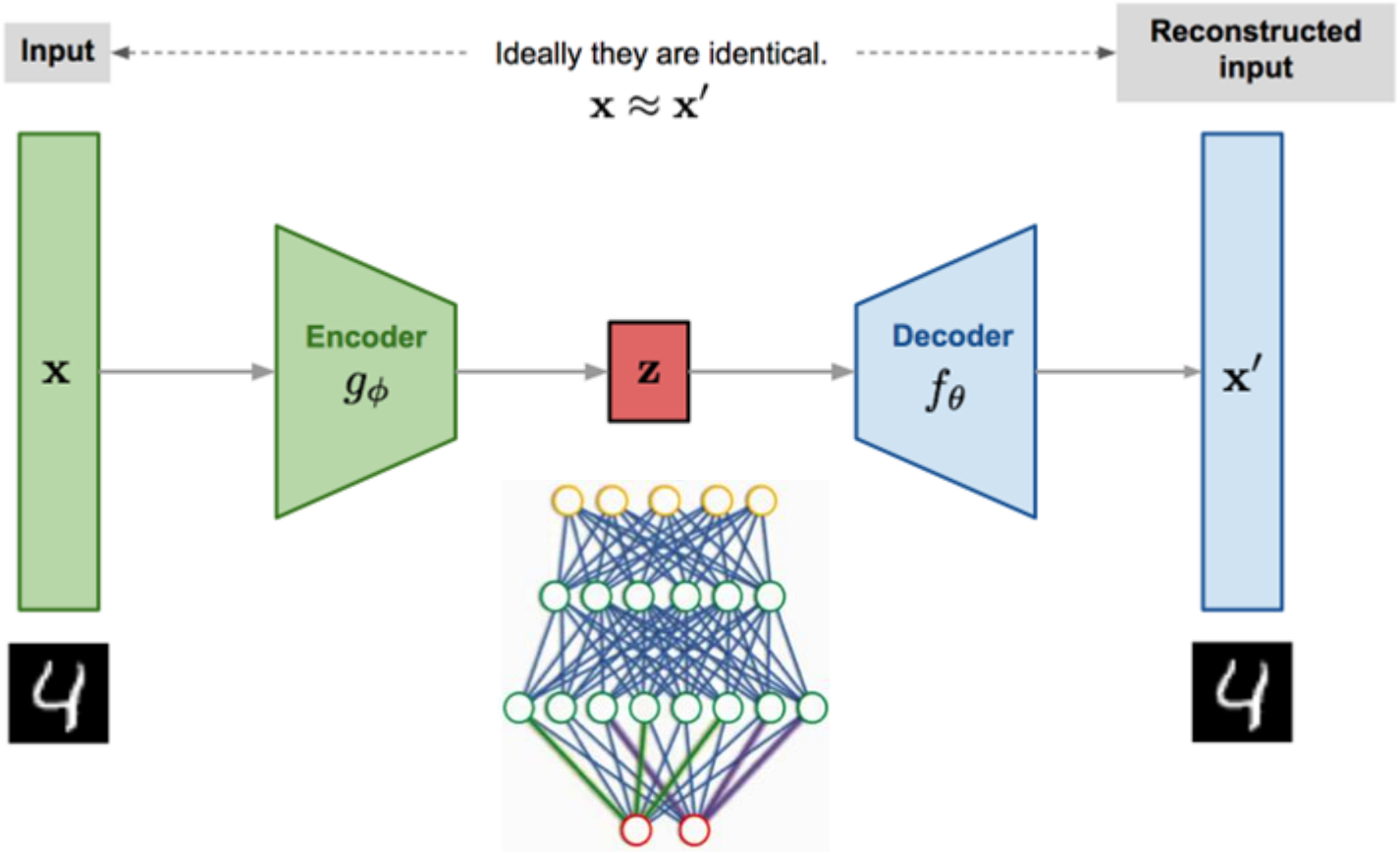

Summary

- Encoder – Decoder Model has two components; encoder and decoder
- Encoder takes the input sample and produces an intermediate representation
- Decoder takes the output of the encoder
- Encoder-decoder model can be used for end-to-end task or representation learning