Why Do We Need Sequence-to-Sequence Models?

⚠ Challenge: Variable-Length Input → Variable-Length Output

Machine Translation	Text Summarization	Question Answering
Hello	Long article...	What is AI?
→	→	→
안녕하세요	Short summary	AI is...

✓ Solution: Encoder-Decoder Architecture

E Encoder

| x₁ | x₂ | x₃ |

Input Sequence
(variable length)

↓

Compress input
into fixed representation

Context C

D Decoder

| y₁ | y₂ | y₃ | y₄ |

Output Sequence
(variable length)

↑

Generate output
from context vector
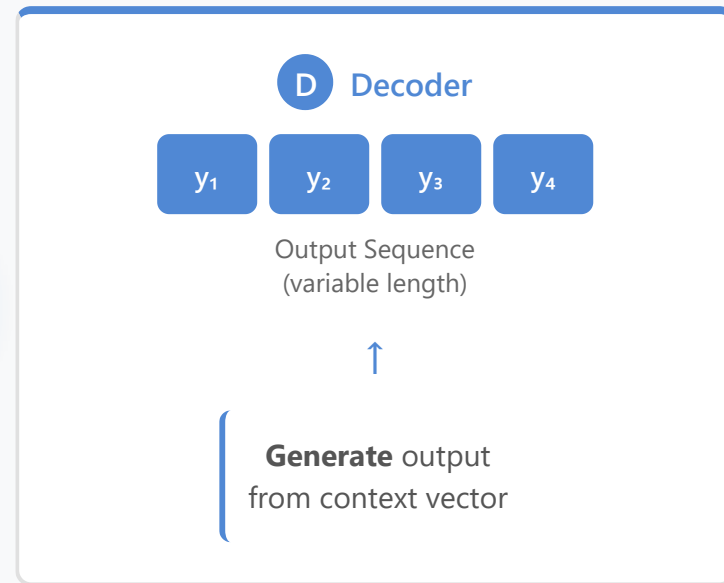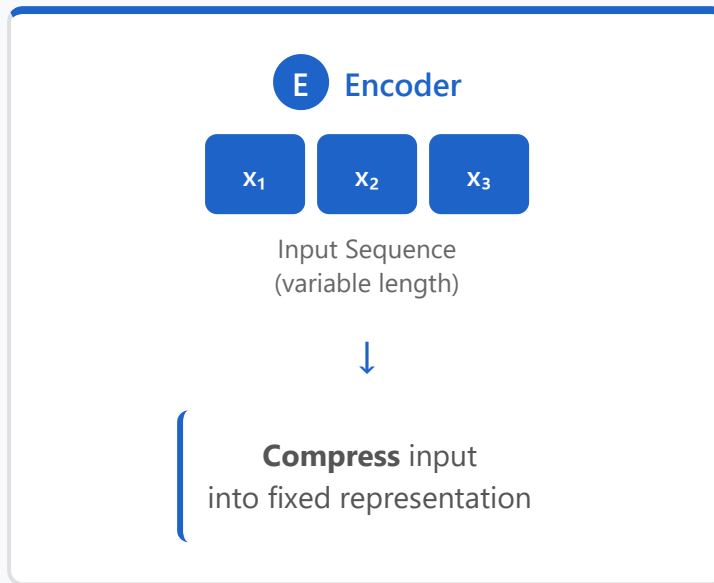
🔄 **Handles different lengths**

📦 **Fixed context vector**

🎯 **End-to-end learning**