

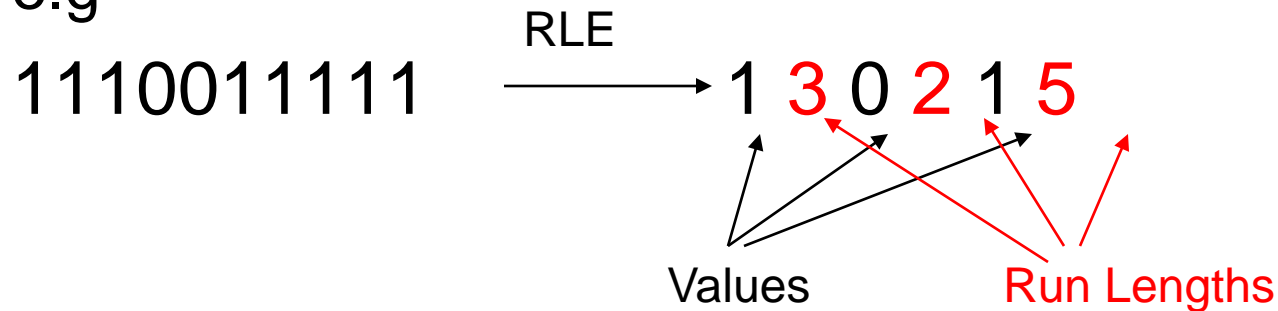
# Run Length Encoder/Decoder

# What is RLE?

## ■ Compression technique

- Represents data using value and run length
- Run length defined as number of consecutive equal values

e.g



# Applications

- Useful for compressing data that contains repeated values
  - e.g. output from a filter, many consecutive values are 0.
- Very simple compared with other compression techniques
- Reversible (Lossless) compression
  - decompression is just as easy

# Arithmetic Coding

# Encoder

- Example: low=0.33184, high=0.33220
- Code=0, k=1
- While (value(code)<low)
  - { Assign 1 to the k-th binary fraction bit:
    - Decimal value(code)=value(0.1)=0.5>high (NOT Accepted)
      - ➔ Assign 0 to the k-th binary fraction bit
  - k=k+1
- }
- The while loop continues if  
Decimal value(code)=value(0.0)=0<low.
- The binary codeword generated is 0.01010101 (=  $2^{-2}+2^{-4}+2^{-6}+2^{-8}=0.33203125$ )

# Decoder

- Value=0.33203125
- $\text{Range\_low}(C)=0.3 \leq 0.33203125 < 0.5 = \text{Range\_high}(C)$ 
  - ➔ The first output symbol is C
- This yields value =  $[0.33203125 - 0.3] / 0.2 = 0.16015625$ 
  - ➔ second output symbol A