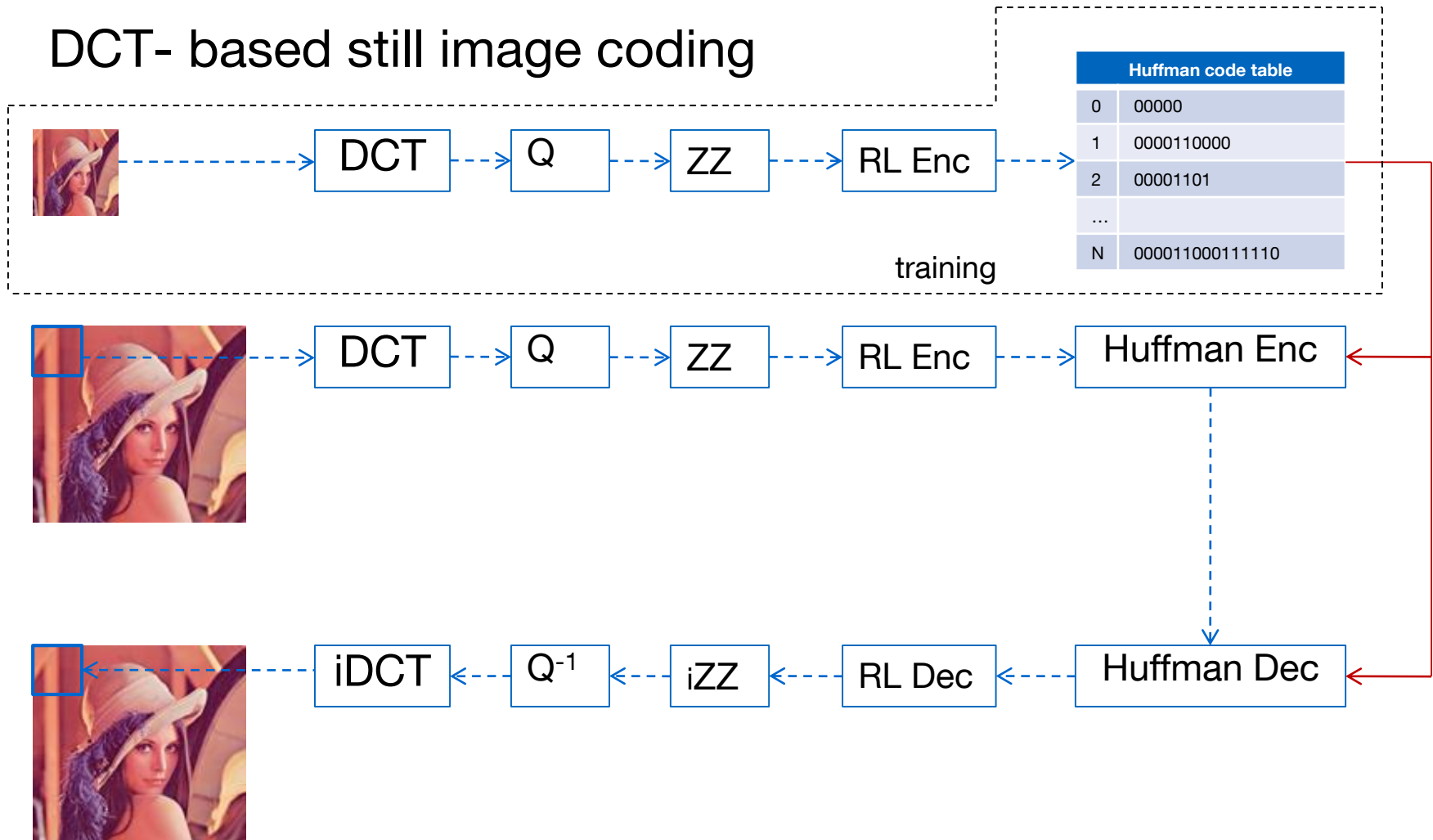


## Chapter 4 Transform Coding

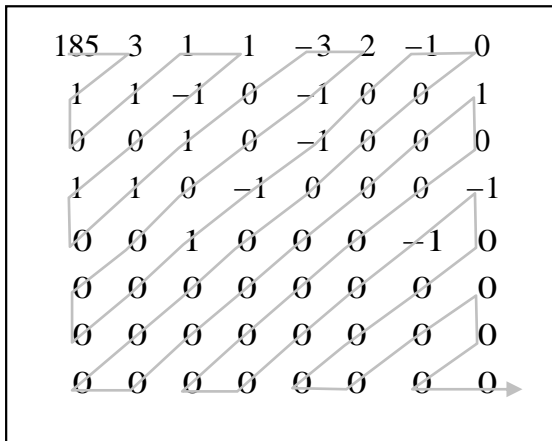
- Discrete Cosine Transform (DCT)
- Subband Coding and DWT
  - P-questions are required
  - Experiments (E4-1 – E4-2) are required
  - Experiments (E4-3 – E4-8) are optional

# DCT- based still image coding



# Zig Zag Scan

Input\_8x8:



Output\_1x64

```
( 185  3 1 0 1 1 1 -1 0 1 0 1 1 0 -3
2 -1 0 0 0 0 0 0 1 -1 -1 0 -1 0 0
0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
0 0 0 0 0 -1 -1 0 0 0 0 0 0 0 0 0)
```

ZigZag:

1	2	6	7	15	16	28	29
3	5	8	14	17	27	30	43
4	9	13	18	26	31	42	44
10	12	19	25	32	41	45	54
11	20	24	33	40	46	53	55
21	23	34	39	47	52	56	61
22	35	38	48	51	57	60	62
36	37	49	50	58	59	63	64

*Matlab code example:*

```
Output_1x64( ZigZag(:) ) = Input_8x8(:)
```

```
deZigZag8x8 = Output_1x64( ZigZag(:) )
```

```
deZigZag8x8 = reshape(deZigZag8x8, 8, 8)
```

# Run-level Coding

Sequence	Code (general run-level)	Code (only zero runs)
5, 6	(5,0), (6,0)	5, 6
0, 0, 8, 2, 2	(0,1), (8,0), (2,1)	0, 1, 8, 2, 2
4, 4, 4, 0, 0, 0, 0, 0, 9	(4,2), (0,4), (9,0)	4, 4, 4, 0, 4, 9



( 185 3 1 0 1 1 1 -1 0 1 0 1 1 0 -3

2 -1 0 0 0 0 0 0 1 -1 -1 0 -1 0 0

0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0

0 0 0 0 0 -1 -1 **0 0 0 0 0 0 0 0 0 0**)



( 185 3 1 0 0 1 1 1 -1 0 0 1 0 0 1 1 0 0 -3

2 -1 0 5 1 -1 -1 0 0 -1 0 1 3

1 0 8 -1 -1 **EOB**