Huffman Codes Example

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Example

- Say we want to encode a text with the characters a, b,…, g occurring with the following frequencies:

	a	b	c	d	e	f	g
Frequency	37	18	29	13	30	17	6

Fixed-Length Code

	a	b	c	d	e	f	g
Frequency	37	18	29	13	30	17	6
Fixed-length code	000	001	010	011	100	101	110

- Total size is:

  (37 + 18 + 29 + 13 + 30 + 17 + 6) x 3= 450 bits

Variable-Length Code

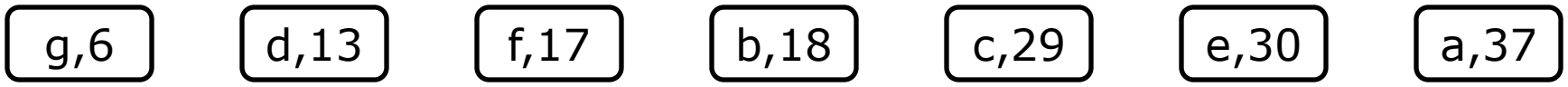
	a	b	c	d	e	f	g
Frequency	37	18	29	13	30	17	6
Variable-length code	10	011	111	1101	00	010	1100

- Total size is:

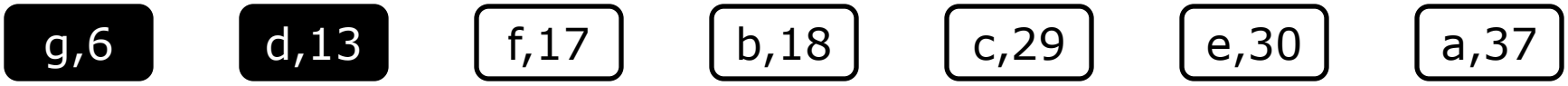
  37x2 + 18x3 + 29x3 + 13x4 + 30x2 + 17x3 + 6x4 = 402 bits

- A savings of approximately 11%

Constructing a Huffman Code



Constructing a Huffman Code



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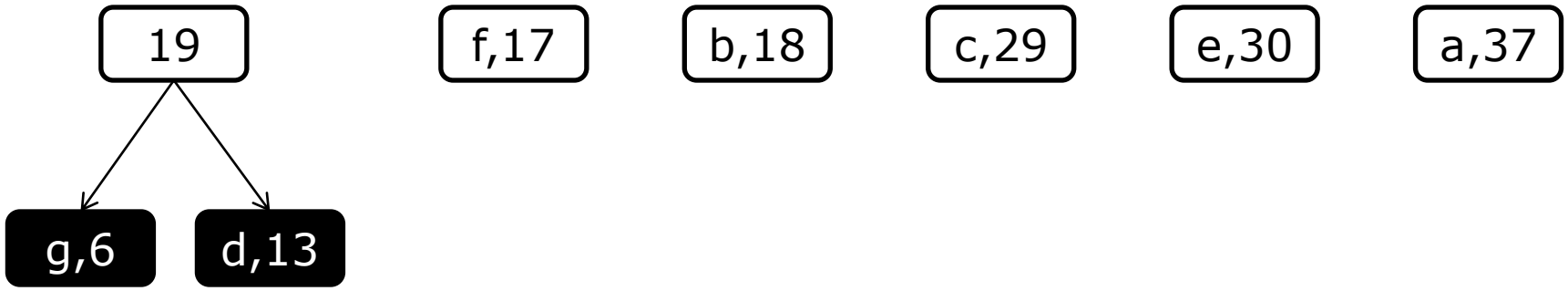

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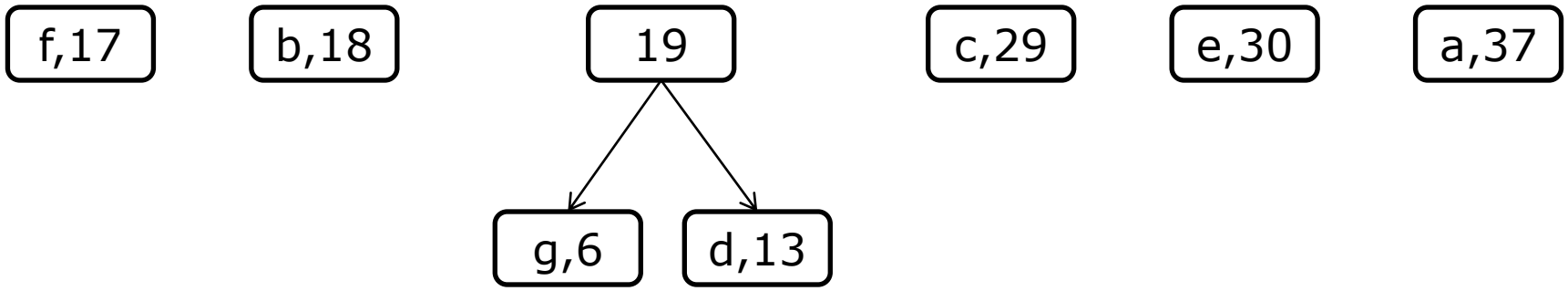

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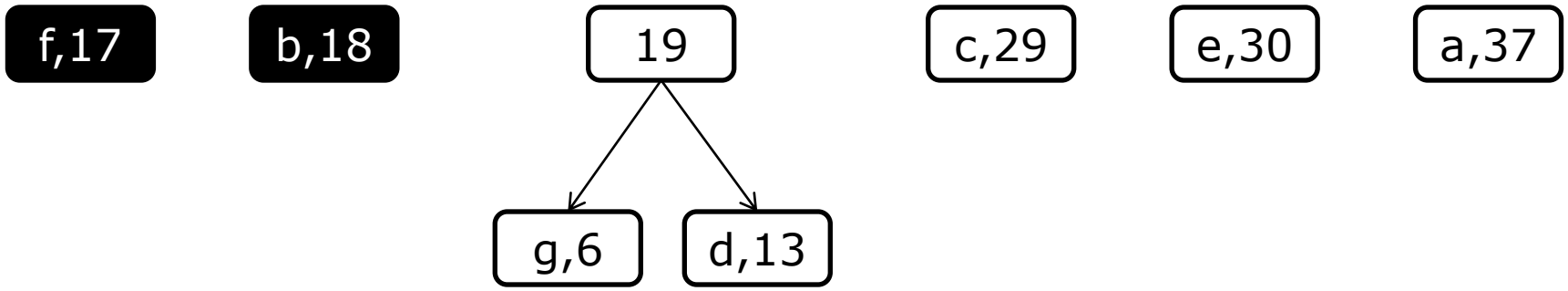

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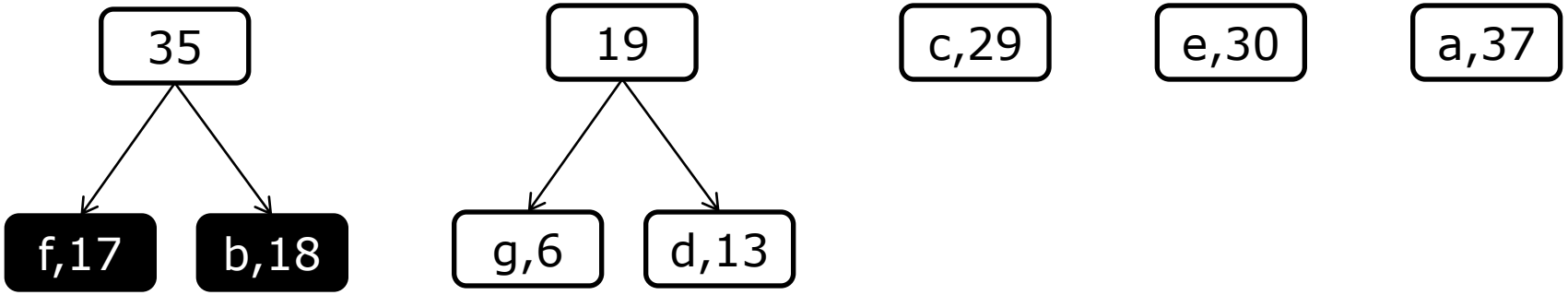

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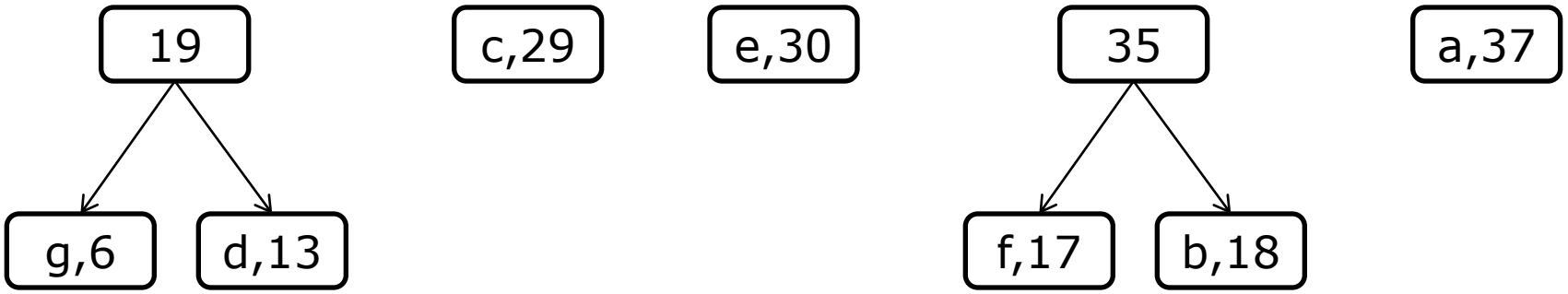

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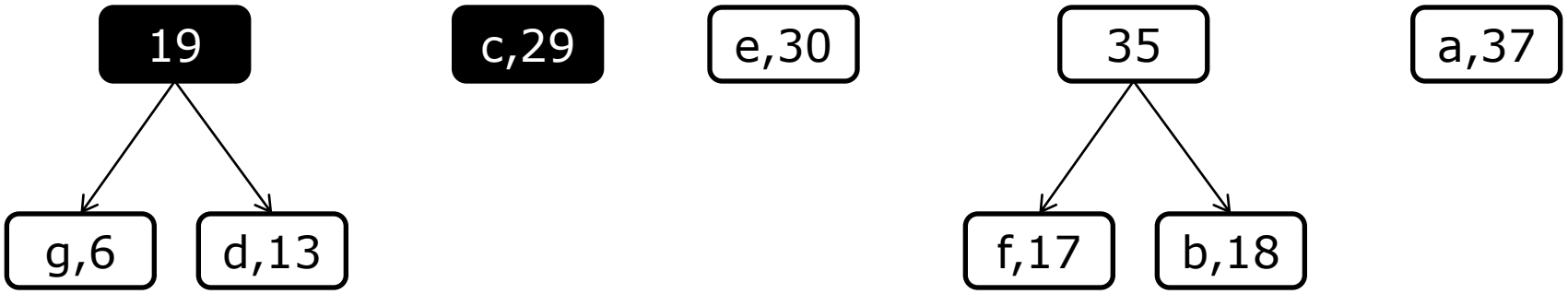

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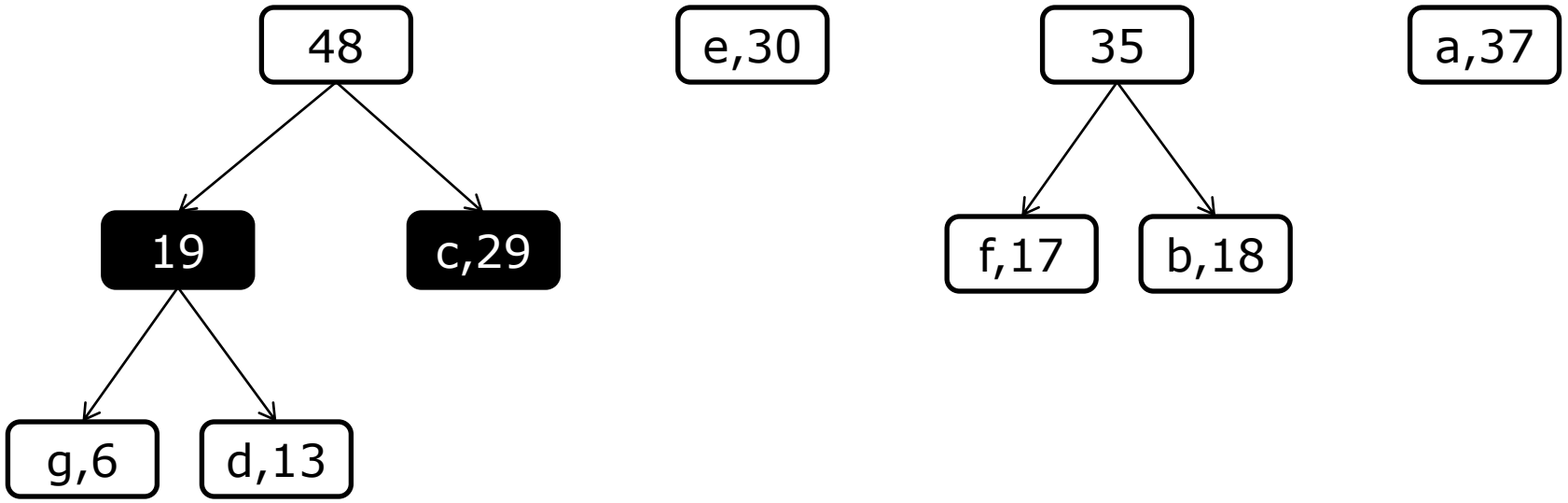

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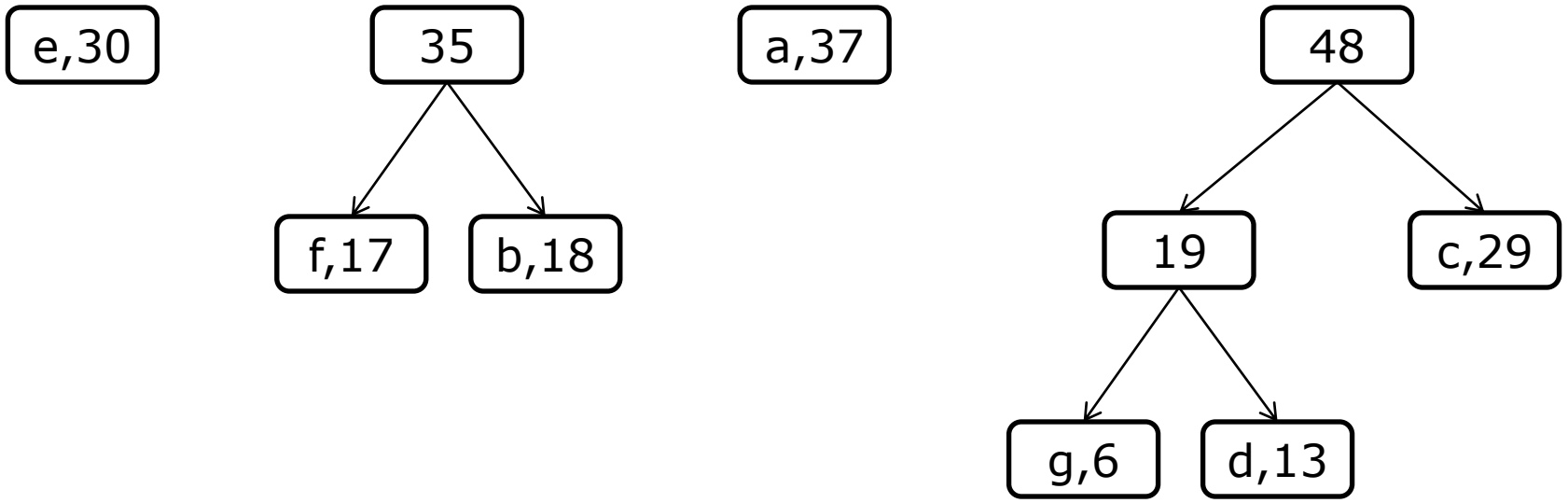

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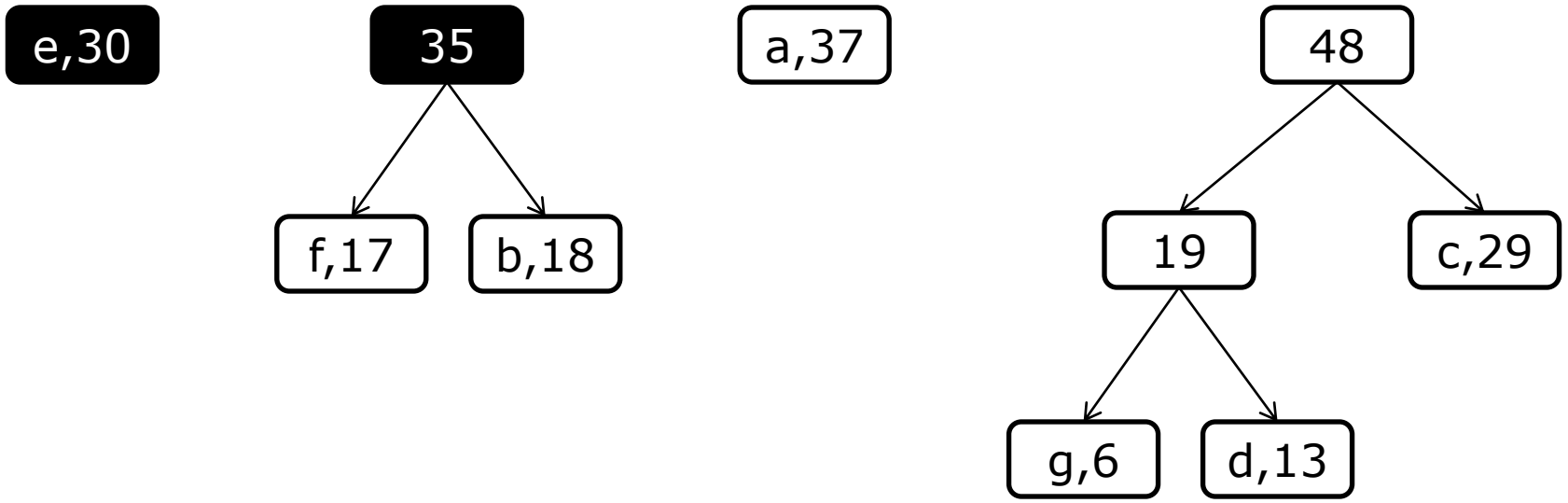

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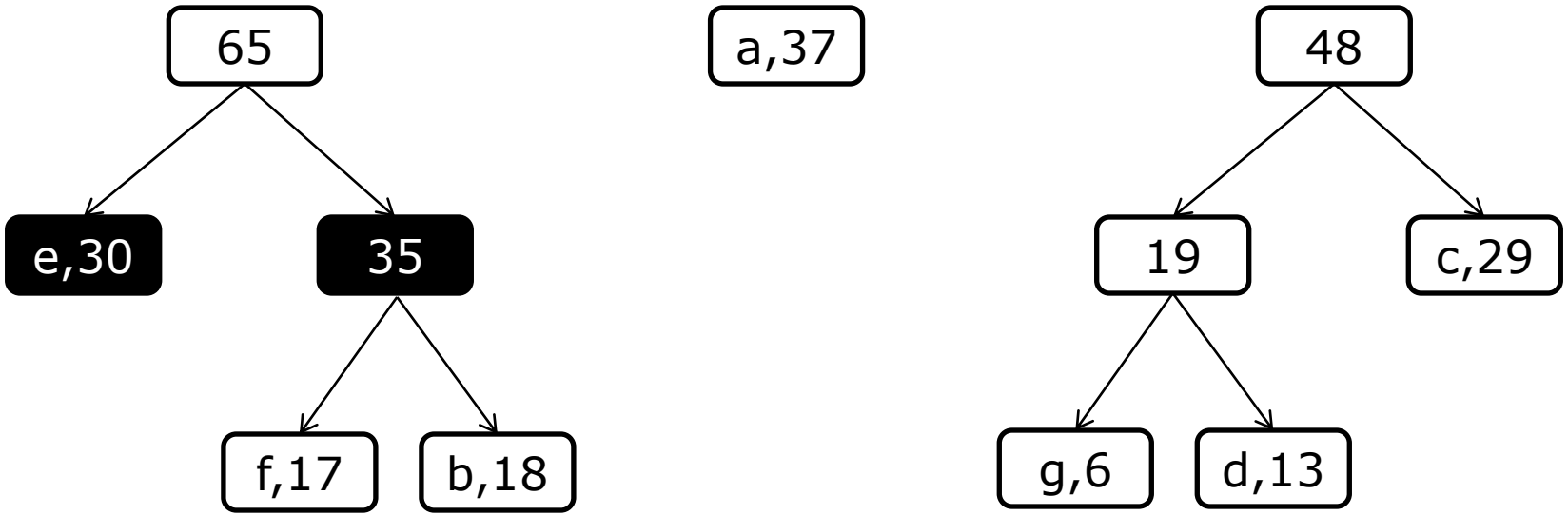

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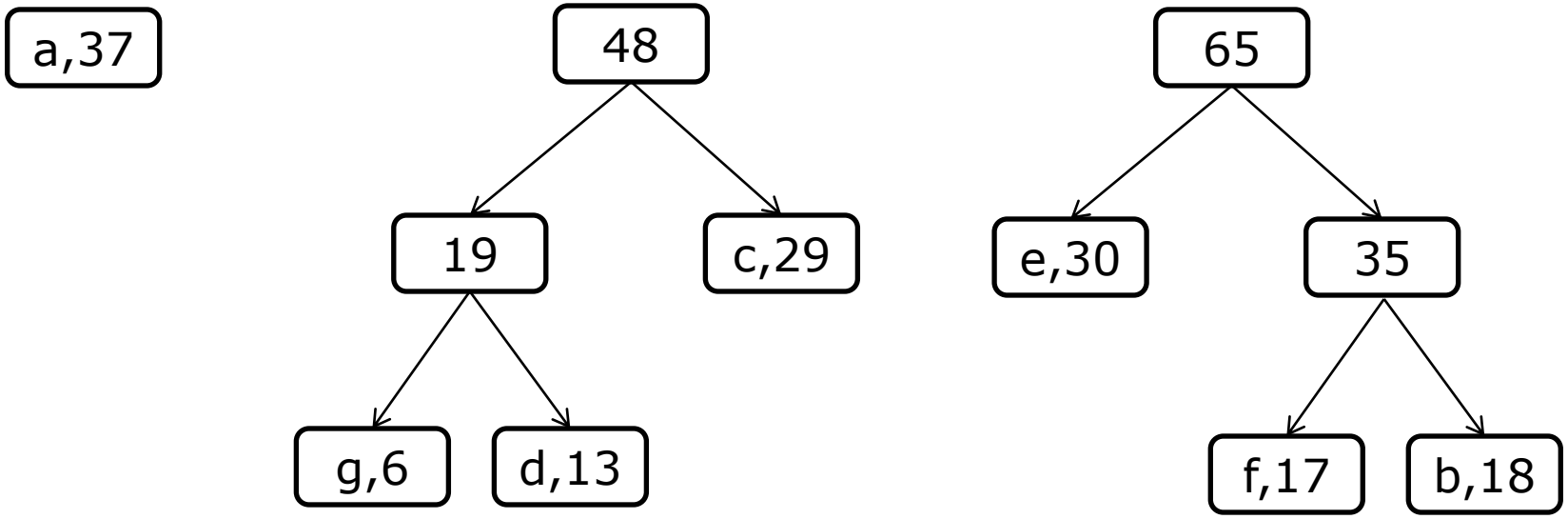

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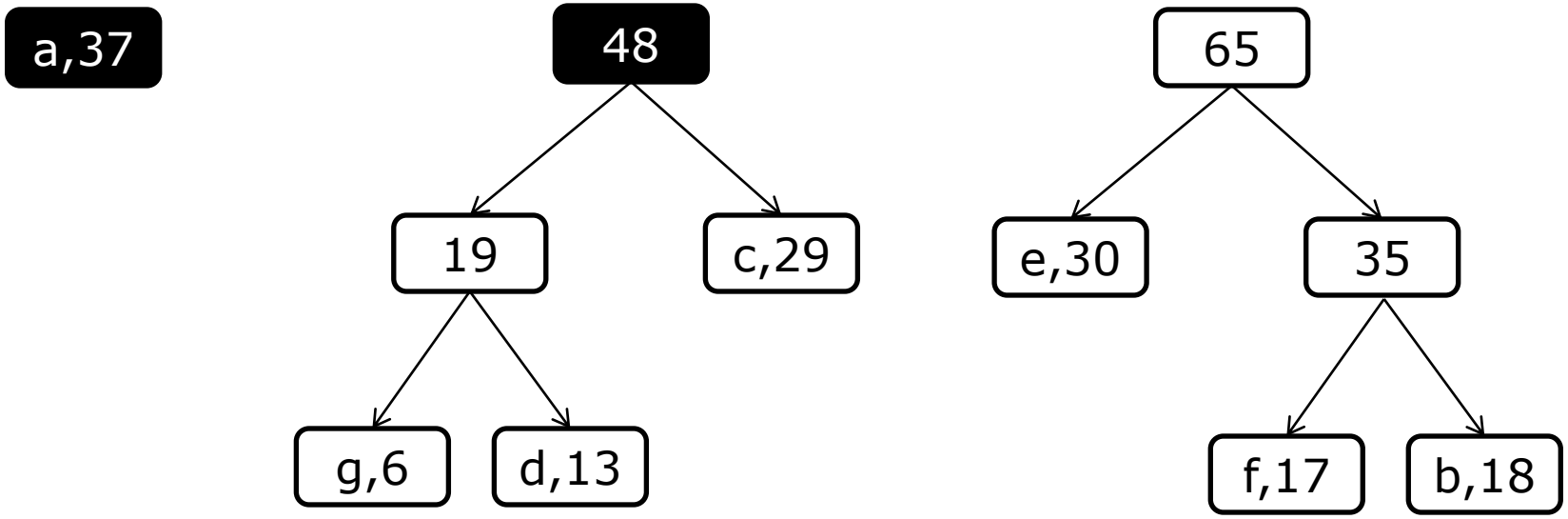

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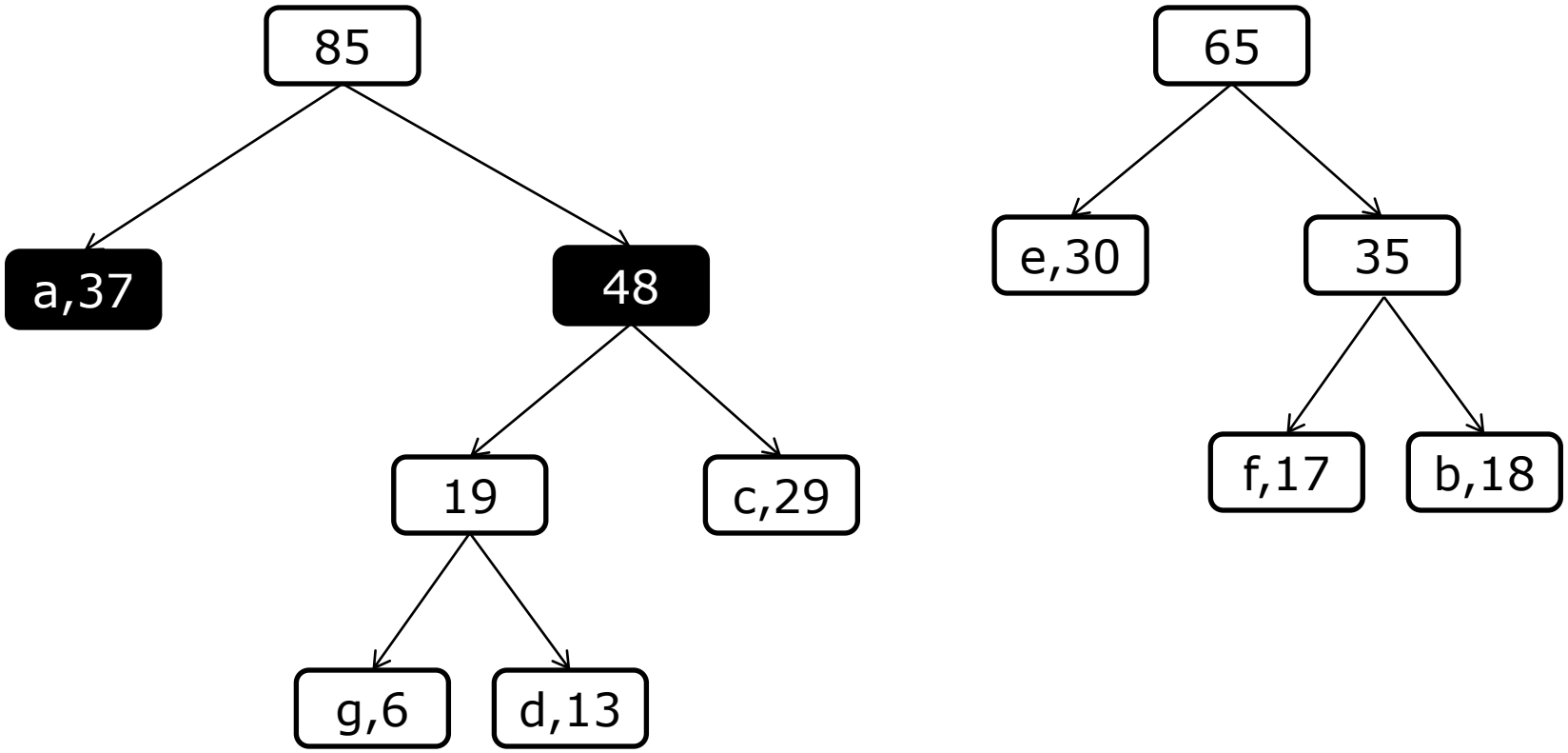

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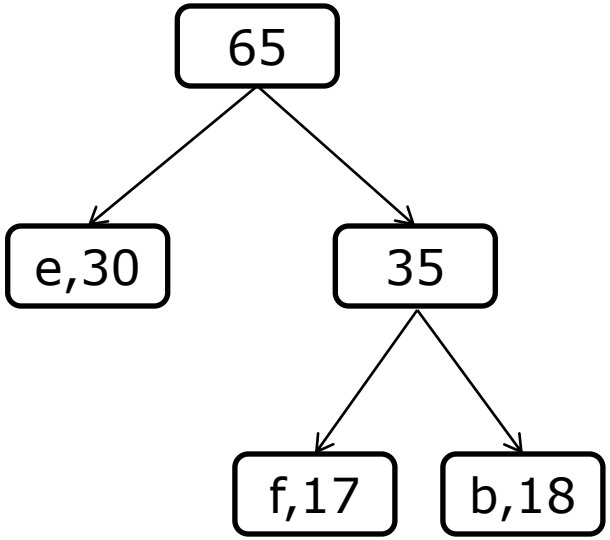

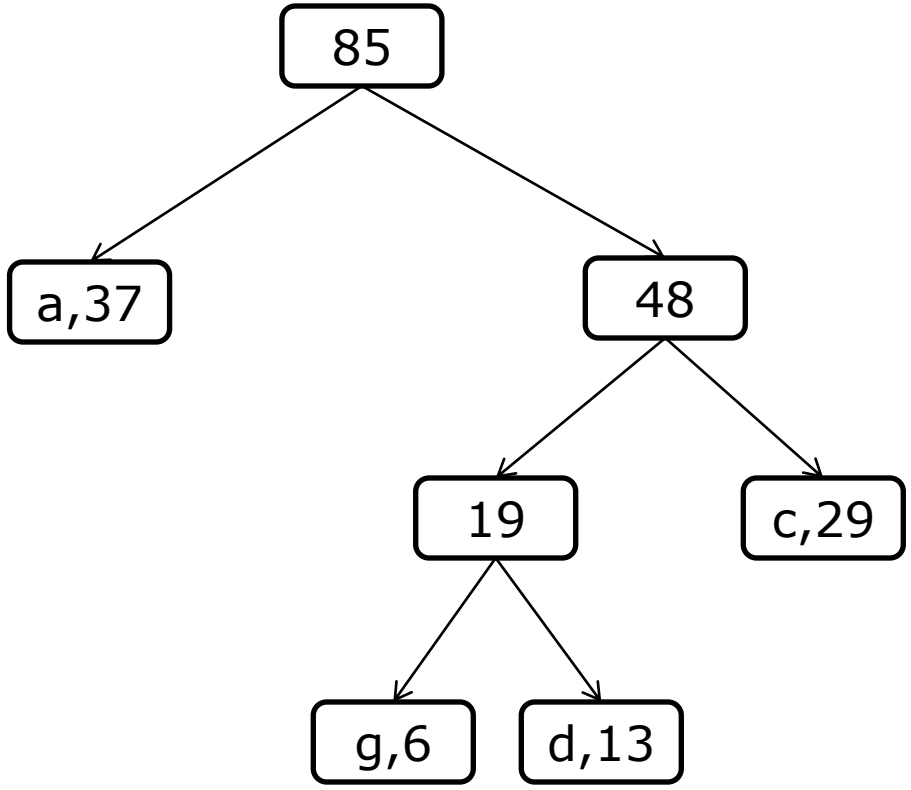

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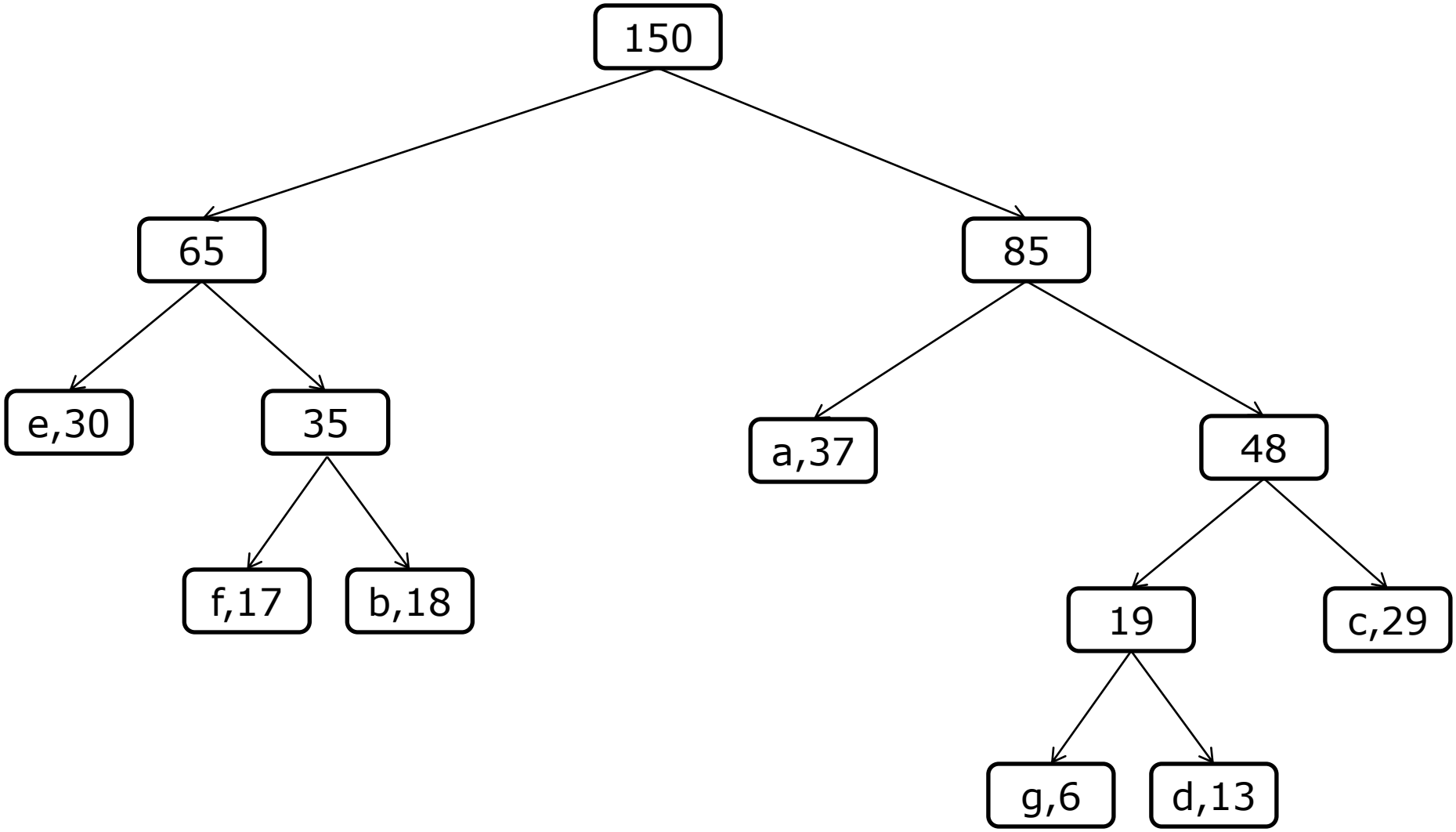
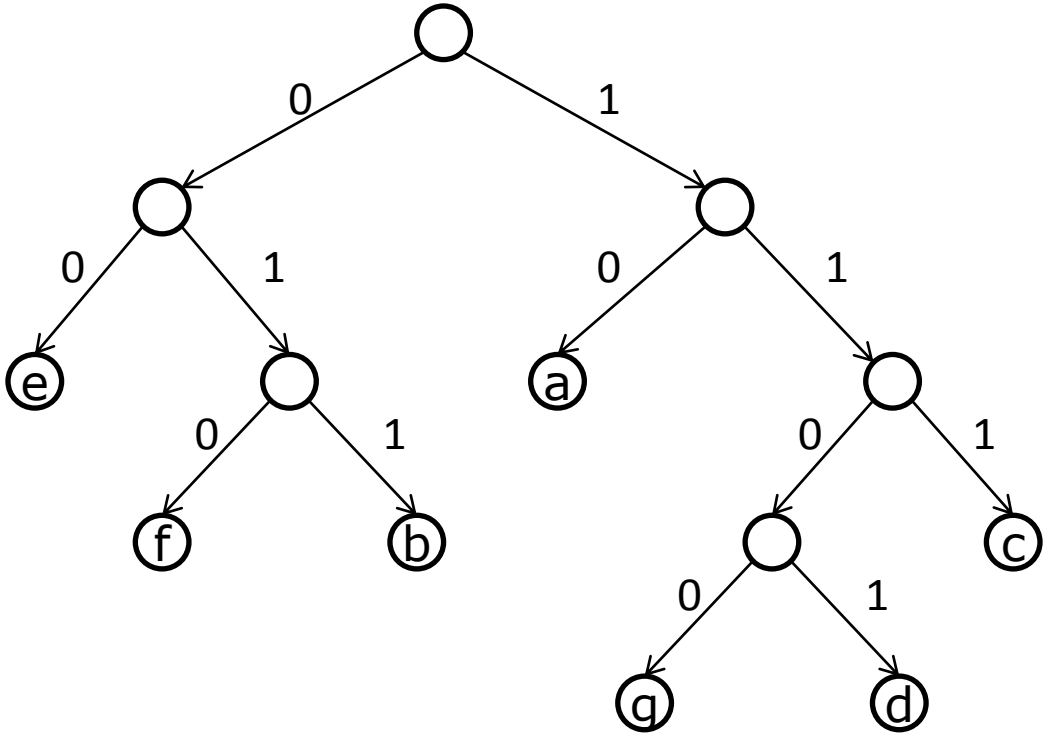


Resulting Code



a	10
b	011
c	111
d	1101
e	00
f	010
g	1100