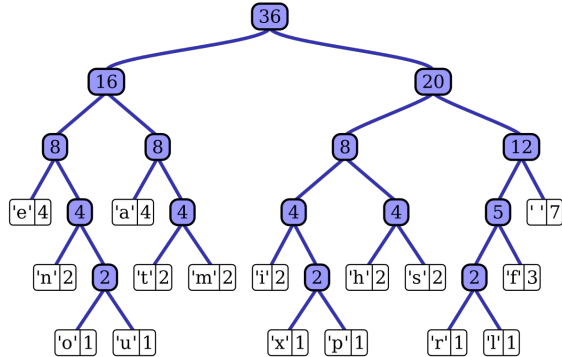






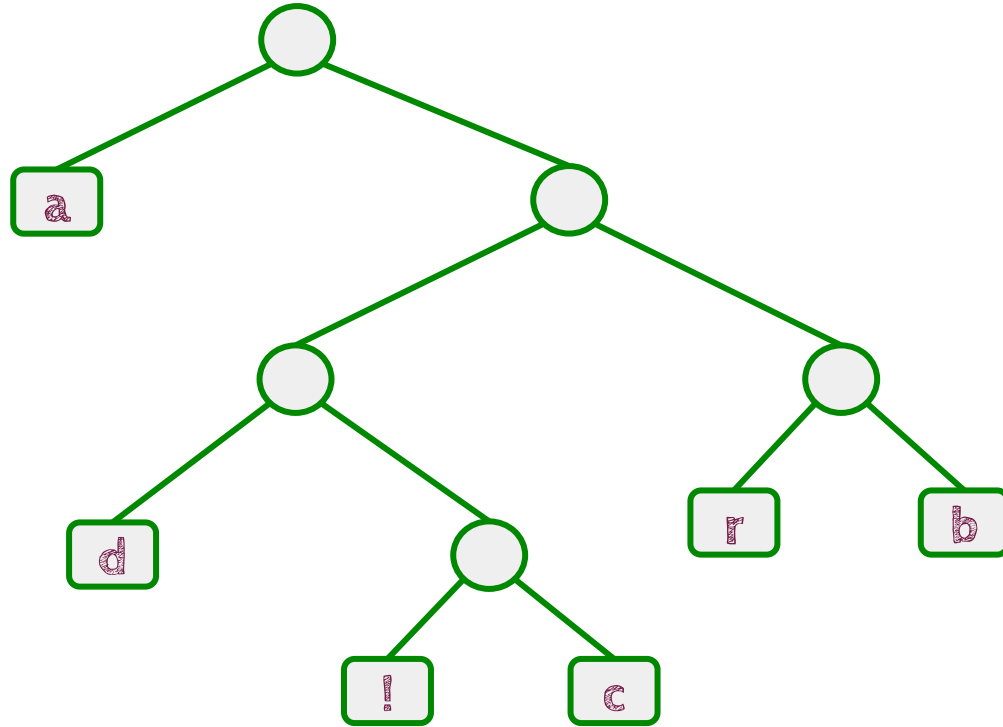
Huffman ağacı ve kodlama



color	freq.	bit code
	14	0
	6	10
	3	110
	2	111

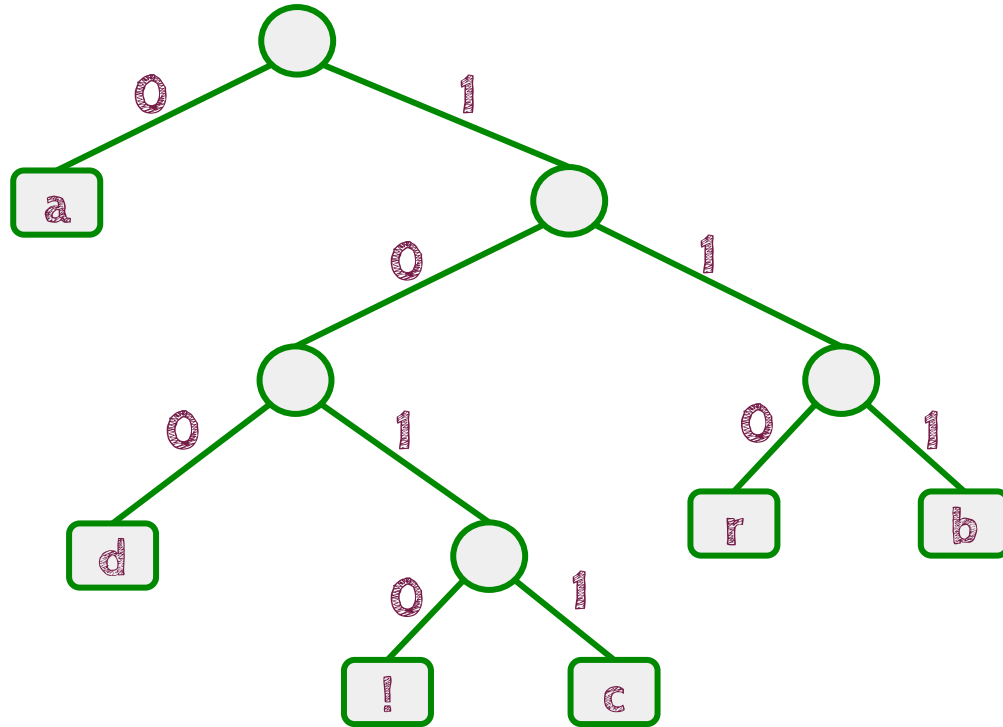
SuhapsAHİN
Onur GÖK

Huffman Kodlama



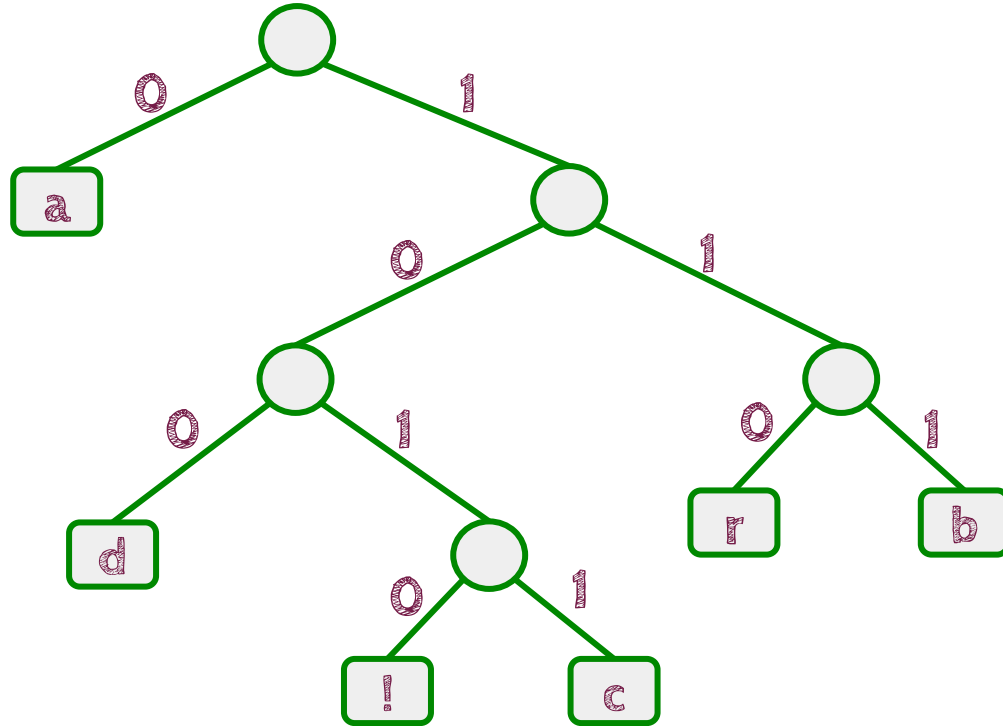
karakter	kodlama
a	
b	
c	
d	
r	
!	

Huffman Kodlama



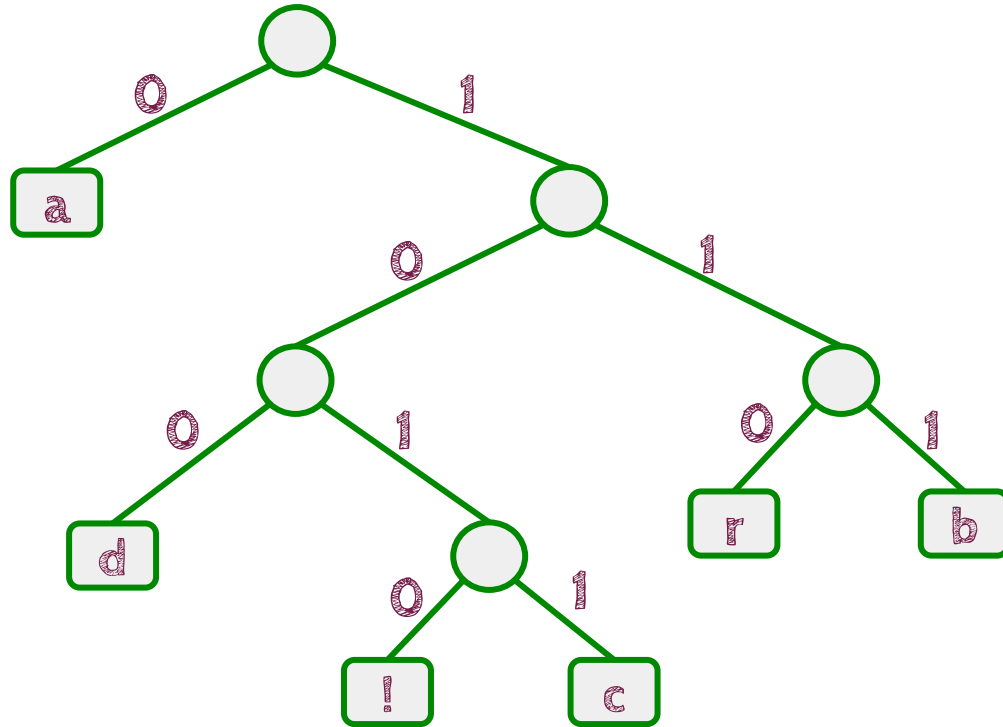
karakter	kodlama
a	
b	
c	
d	
r	
!	

Huffman Kodlama



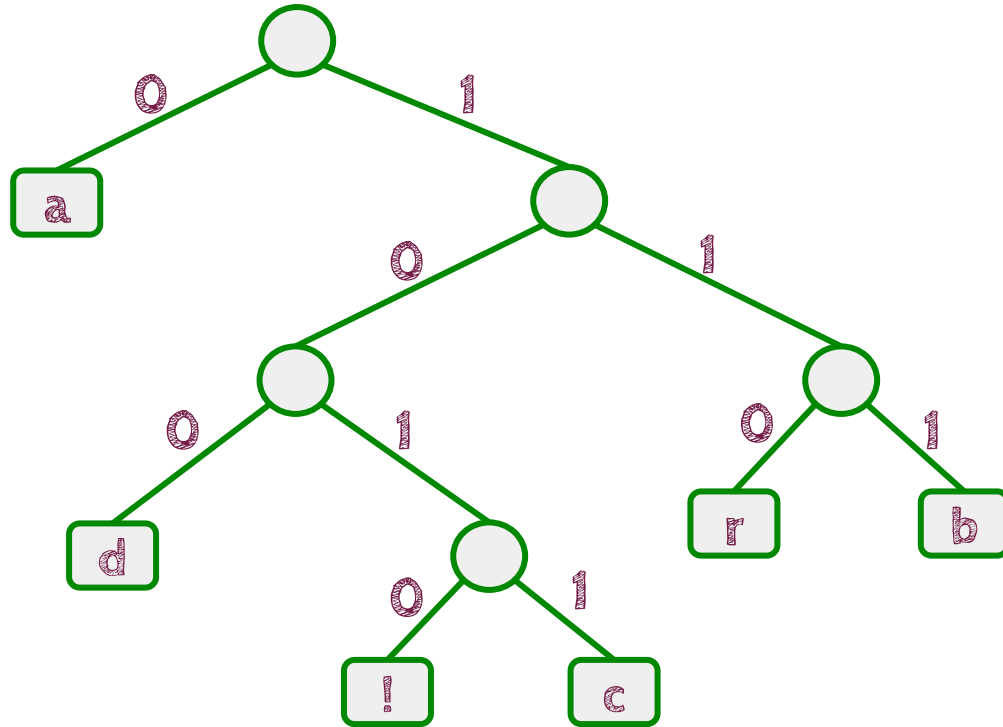
karakter	kodlama
a	0
b	
c	
d	
r	
!	

Huffman Kodlama



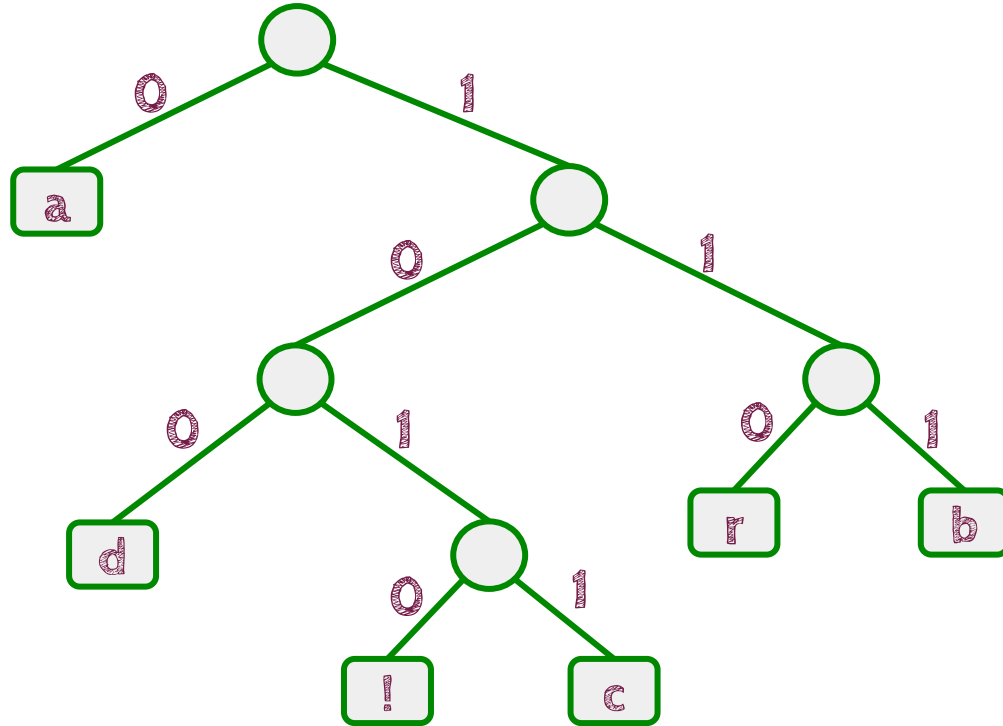
karakter	kodlama
a	0
b	111
c	
d	
r	
!	

Huffman Kodlama



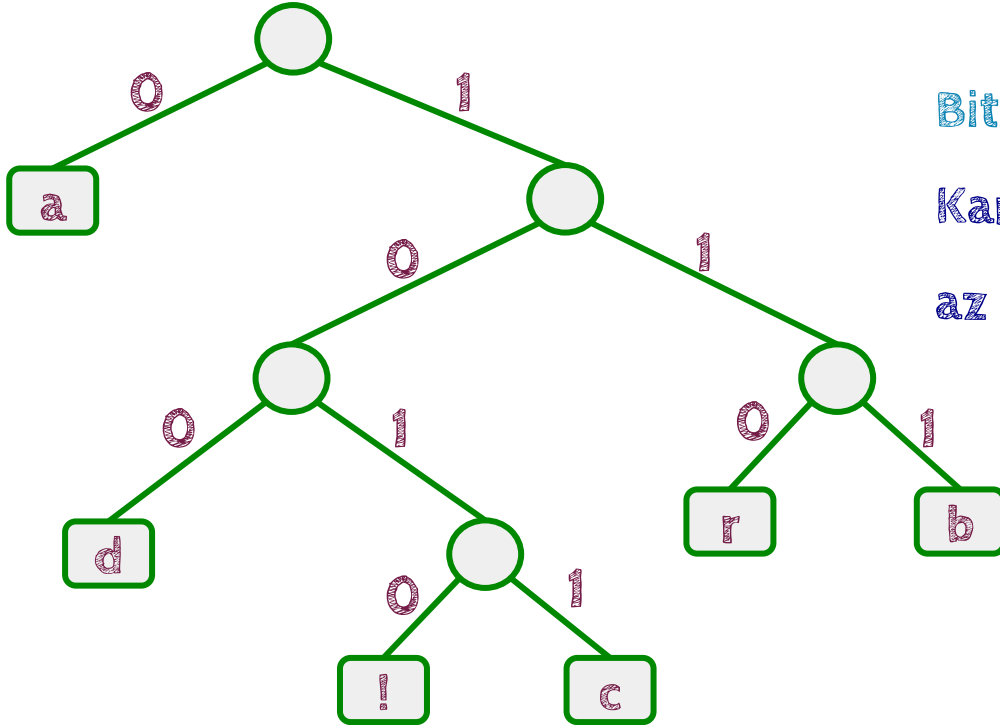
karakter	kodlama
a	0
b	111
c	1011
d	
r	
!	

Huffman Kodlama



karakter	kodlama
a	0
b	111
c	1011
d	100
r	110
!	1010

Huffman Kodlama

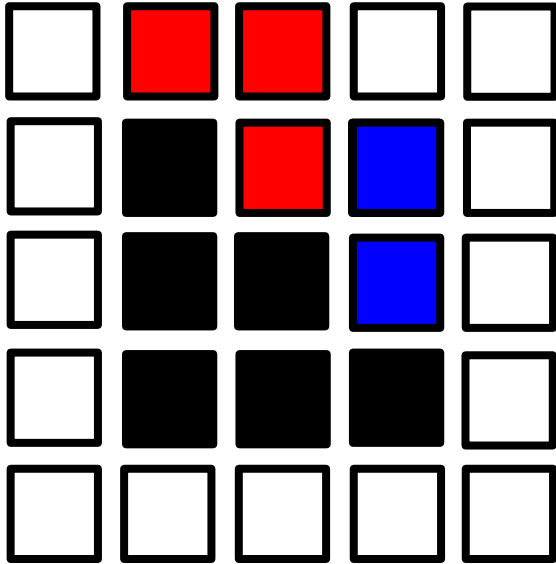


Bit düzeyinde sıkıştırma

Karakterleri frekansına göre daha az bit değeriyle tutmak

Huffman Kodlama

istatiksels olarak kodlama yapılır



renk	tekrar	kod	maliyet	maliyet
	14	0	14	42
	6	10	12	18
	3	110	9	6
	2	111	6	6

Frekans bulma

CERACECCERCEERACEECECRCECCECE

Karakterler	C	E	R	A
-------------	---	---	---	---

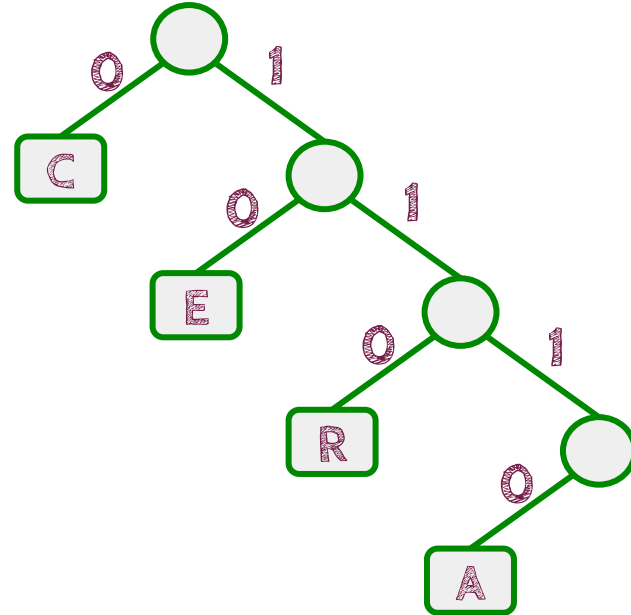
Frekansları	12	9	4	2
-------------	----	---	---	---

Ağaç Oluşturma

CERACECCERCERACECEECRCECCECE

Karakterler	C	E	R	A
-------------	---	---	---	---

Frekansları	12	9	4	2
-------------	----	---	---	---



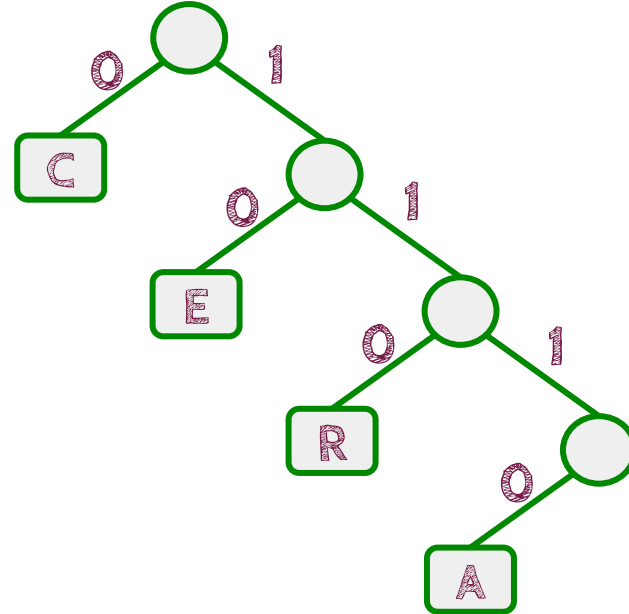
Kodlama

C E R A C E C C E R C E R A C E C E C R C E C C E C E

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

Karakterler	C	E	R	A
-------------	---	---	---	---

Frekansları	12	9	4	2
-------------	----	---	---	---



C	0
---	---

E	10
---	----

R	110
---	-----

A	1110
---	------

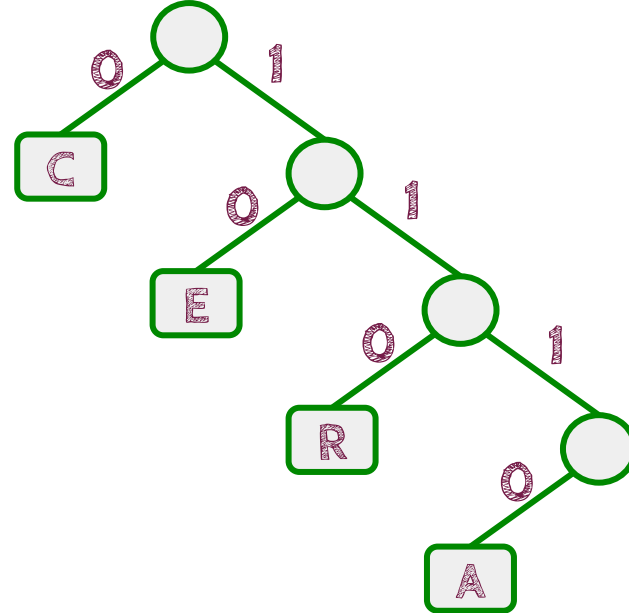
Metin Olusturma

C E R A C E C C E R C E R A C E C E C R C E C C E C E

01011011100100010110010110111001001001100100010010

Karakterler	C	E	R	A
-------------	---	---	---	---

Frekansları	12	9	4	2
-------------	----	---	---	---



C	0
---	---

E	10
---	----

R	110
---	-----

A	1110
---	------

Örn: Frekans Bulma

Karakter	t	s	o	n	l	e	a
Frekans	53	22	18	45	13	65	45

Örn: Ağac oluşturma



Kuyruk iki veya daha fazla düğüm içeriyorsa:

Karakter	t	s	o	n	l	e	a
Frekans	53	22	18	45	13	65	45

Örn: Ağac oluşturma



Kuyruk iki veya daha fazla düğüm içeriyorsa:

- ❖ Yeni düğüm oluştur
- ❖ Kuyruktaki ilk düğümü al, yeni düğüm sol çocuk yap
- ❖ Kuyruktaki ikinci düğümü al, yeni düğüm sağ çocuk yap
- ❖ Yeni düğümün değerini çocukların karakter toplamı yap
- ❖ Yeni düğümün kuyruktaki yerini bul yerleştir.

Karakter	t	s	o	n	l	e	a
Frekans	53	22	18	45	13	65	45

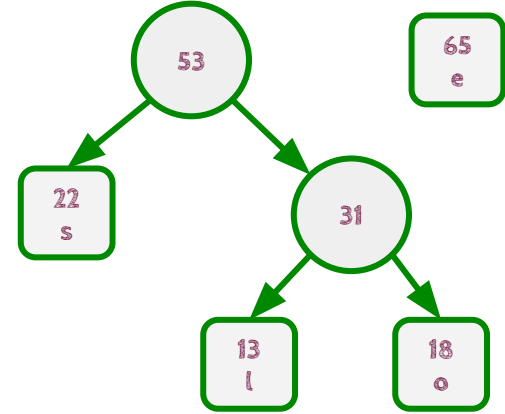
Örn: Ağac oluşturma

45
a

45
n

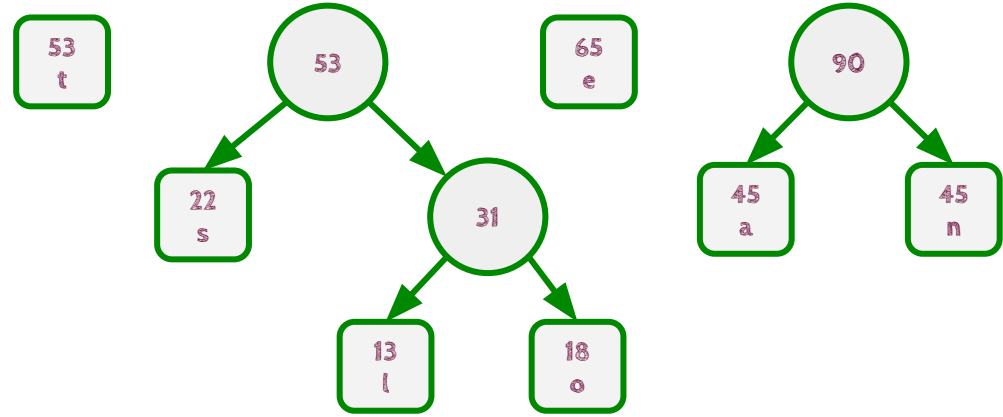
53
t

65
e



Karakter	t	s	o	n	l	e	a
Frekans	53	22	18	45	13	65	45

Örn: Ağac oluşturma



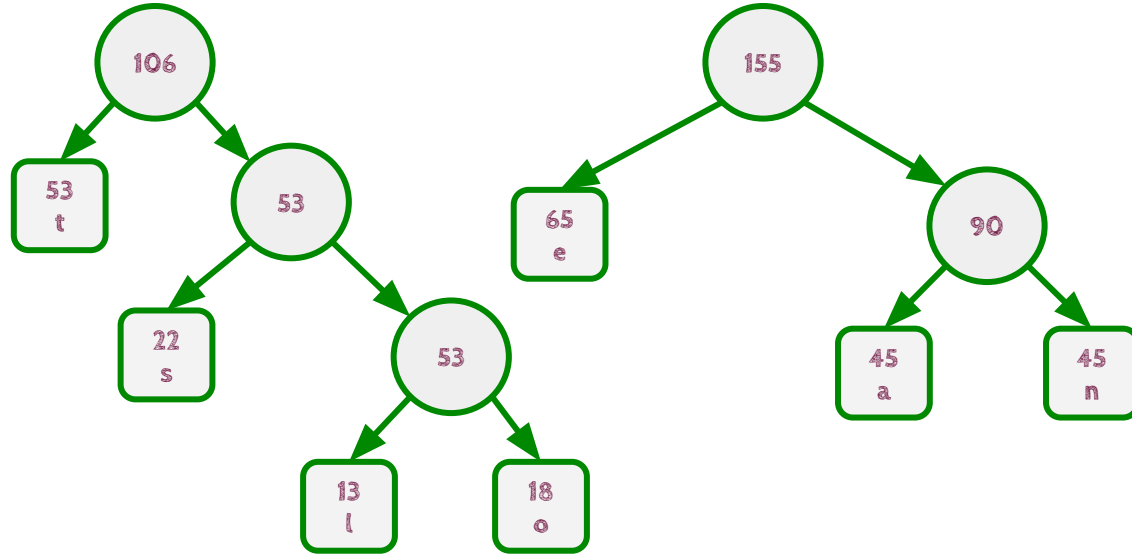
Karakter	t	s	o	n	l	e	a
Frekans	53	22	18	45	13	65	45

四四



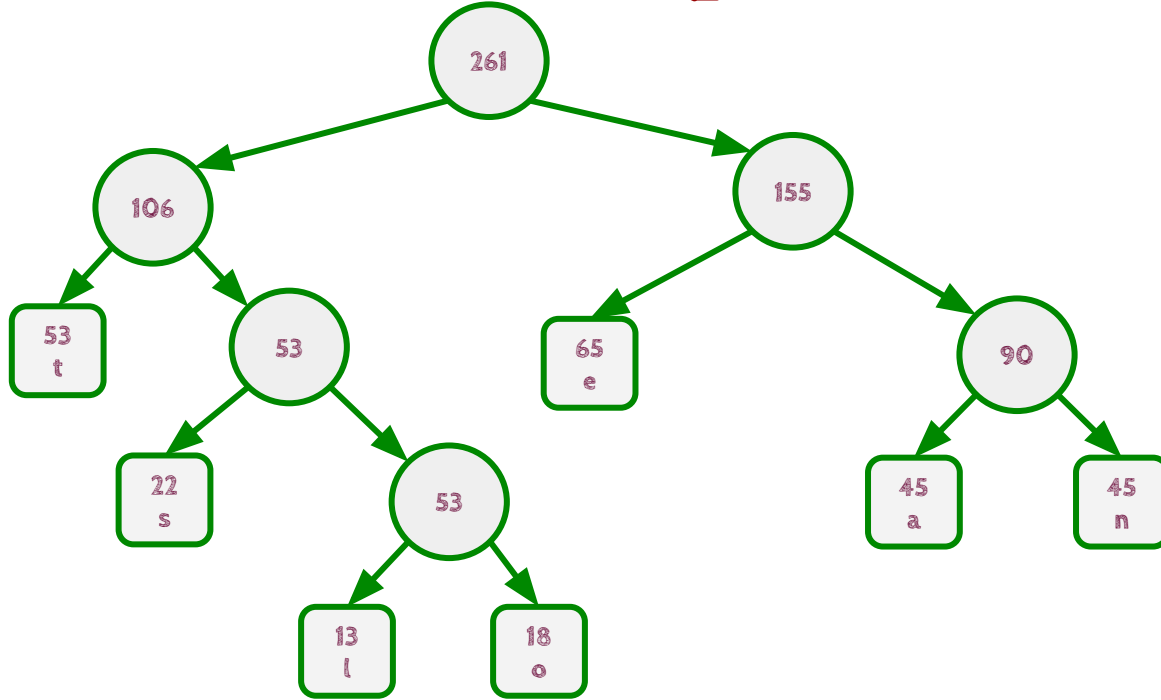
Karakter	t	s	o	n	l	e	a
Frekans	53	22	18	45	13	65	45

Örn: Ağac oluşturma



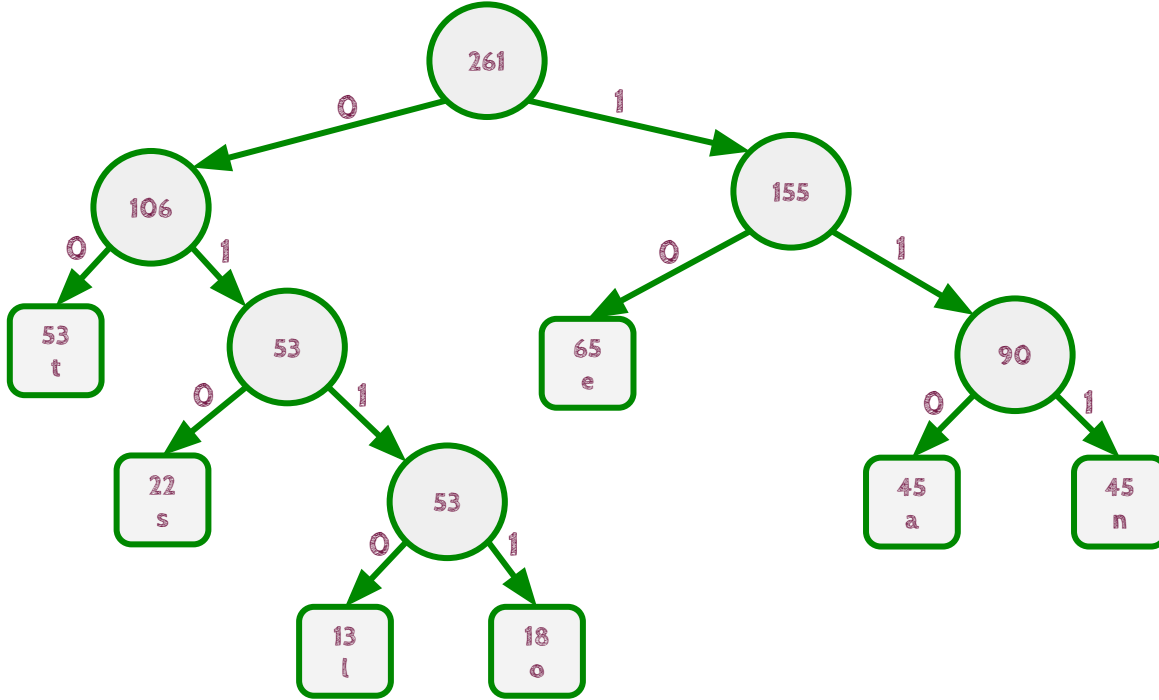
Karakter	t	s	o	n	l	e	a
Frekans	53	22	18	45	13	65	45

Örn: Ağac oluşturma



Karakter	t	s	o	n	l	e	a
Frekans	53	22	18	45	13	65	45

Örn: Kodlama



Karakter	t	s	o	n	l	e	a
Huffman Kodu	00	010	0111	111	0110	10	110

Metin Olusturma

Karakter t s o n l e a

Frekans 53 22 18 45 13 65 45

Frekans * Bit sayısı :

$$(53+22+18+45+13+65+45) * 8$$

$$= 261 * 8$$

$$= 2088$$

Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char
0	0	[NULL]	32	20	[SPACE]	64	40	@	96	60	`
1	1	[START OF HEADING]	33	21	!	65	41	A	97	61	a
2	2	[START OF TEXT]	34	22	"	66	42	B	98	62	b
3	3	[END OF TEXT]	35	23	#	67	43	C	99	63	c
4	4	[END OF TRANSMISSION]	36	24	\$	68	44	D	100	64	d
5	5	[ENQUIRY]	37	25	%	69	45	E	101	65	e
6	6	[ACKNOWLEDGE]	38	26	&	70	46	F	102	66	f
7	7	[BELL]	39	27	'	71	47	G	103	67	g
8	8	[BACKSPACE]	40	28	(	72	48	H	104	68	h
9	9	[HORIZONTAL TAB]	41	29	)	73	49	I	105	69	i
10	A	[LINE FEED]	42	2A	*	74	4A	J	106	6A	j
11	B	[VERTICAL TAB]	43	2B	+	75	4B	K	107	6B	k
12	C	[FORM FEED]	44	2C	,	76	4C	L	108	6C	l
13	D	[CARRIAGE RETURN]	45	2D	-	77	4D	M	109	6D	m
14	E	[SHIFT OUT]	46	2E	.	78	4E	N	110	6E	n
15	F	[SHIFT IN]	47	2F	/	79	4F	O	111	6F	o
16	10	[DATA LINK ESCAPE]	48	30	0	80	50	P	112	70	p
17	11	[DEVICE CONTROL 1]	49	31	1	81	51	Q	113	71	q
18	12	[DEVICE CONTROL 2]	50	32	2	82	52	R	114	72	r
19	13	[DEVICE CONTROL 3]	51	33	3	83	53	S	115	73	s
20	14	[DEVICE CONTROL 4]	52	34	4	84	54	T	116	74	t
21	15	[NEGATIVE ACKNOWLEDGE]	53	35	5	85	55	U	117	75	u
22	16	[SYNCHRONOUS IDLE]	54	36	6	86	56	V	118	76	v
23	17	[ENG OF TRANS. BLOCK]	55	37	7	87	57	W	119	77	w
24	18	[CANCEL]	56	38	8	88	58	X	120	78	x
25	19	[END OF MEDIUM]	57	39	9	89	59	Y	121	79	y
26	1A	[SUBSTITUTE]	58	3A	:	90	5A	Z	122	7A	z
27	1B	[ESCAPE]	59	3B	;	91	5B	[	123	7B	{
28	1C	[FILE SEPARATOR]	60	3C	<	92	5C	\	124	7C	|
29	1D	[GROUP SEPARATOR]	61	3D	=	93	5D	]	125	7D	}
30	1E	[RECORD SEPARATOR]	62	3E	>	94	5E	^	126	7E	~
31	1F	[UNIT SEPARATOR]	63	3F	?	95	5F	_	127	7F	[DEL]

Metin Olusturma

Karakter

t

s

o

n

l

e

a

Metin Olusturma

Karakter	t	s	o	n	l	e	a
Huffman Kodu	00	010	0111	111	0110	10	110

Metin Olusturma

Karakter	t	s	o	n	l	e	a
Huffman Kodu	00	010	0111	111	0110	10	110
Bit Sayısı	2	3	4	3	4	2	3

Metin Olusturma

Karakter	t	s	o	n	l	e	a
Huffman Kodu	00	010	0111	111	0110	10	110
Bit Sayısı	2	3	4	3	4	2	3
Frekans	53	22	18	45	13	65	45

Metin Olusturma

Karakter	t	s	o	n	l	e	a
Huffman Kodu	00	010	0111	111	0110	10	110
Bit Sayısı	2	3	4	3	4	2	3
Frekans	53	22	18	45	13	65	45
Frekans * Bit Sayısı	106	66	72	135	52	130	135
Toplam	696						

Metin Olusturma

Sıkıştırılmış dosyadaki bit sayısı

$$\begin{aligned} &= \text{kac_bit} + \text{hangi_karakterler} + \text{toplam_kod} + \text{sıkıştırılmış_metin} \\ &= 3 + (7 \cdot 8) + 21 + 696 \\ &= 776 \end{aligned}$$

Sıkıştırma oranı

$$\begin{aligned} &= \text{normal metin bit sayısı} / \text{kodlanmış metin bit sayısı} \\ &= 2088 / 776 \\ &= 2.69 \end{aligned}$$

sıkıştırılmış metin, gerçek metin %37'si kadardır.

$$100 / 2.69 = 37\%$$

t	00
s	010
o	0111
n	111
l	0110
e	10
a	110

Metin Olusturma

Karakter	a	b	c	d	e	f
Huffman Kodu	0	101	100	111	110	1100

Decode: 11000100110

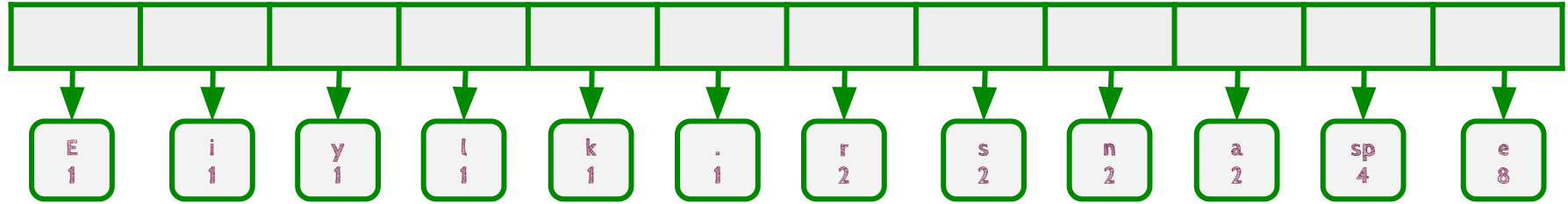
11000100110

face

11000100110

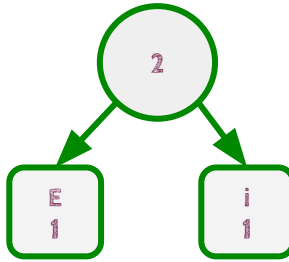
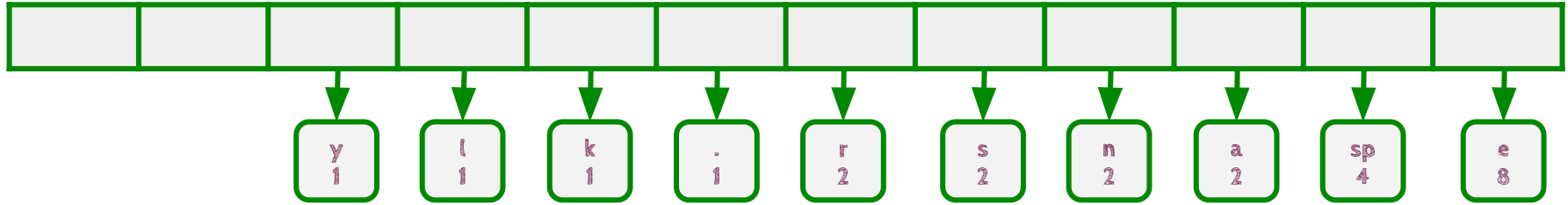
eaace

Statik Huffman Kodlama



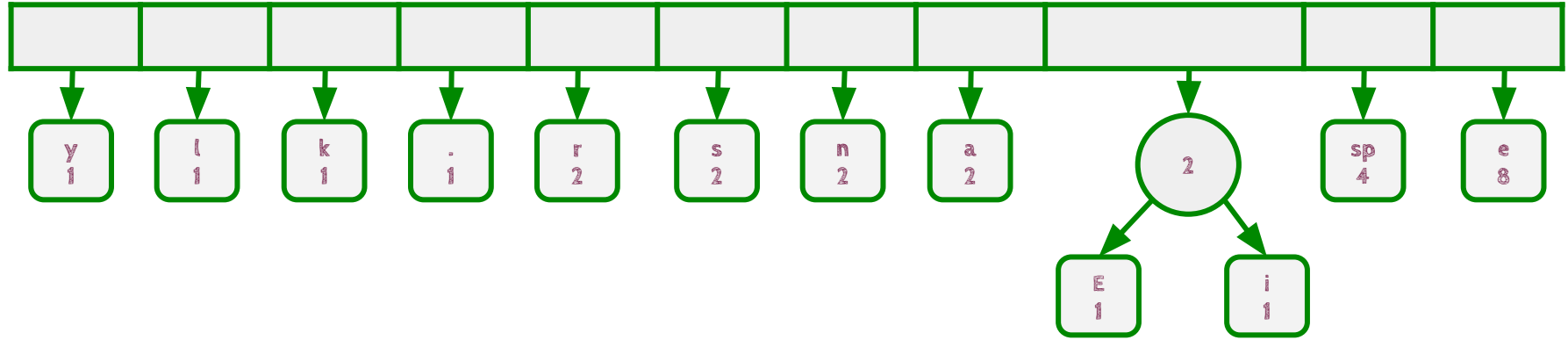
"Eerie eyes seen near lake."

Statik Huffman Kodlama



“Eerie eyes seen near lake.”

Statik Huffman Kodlama

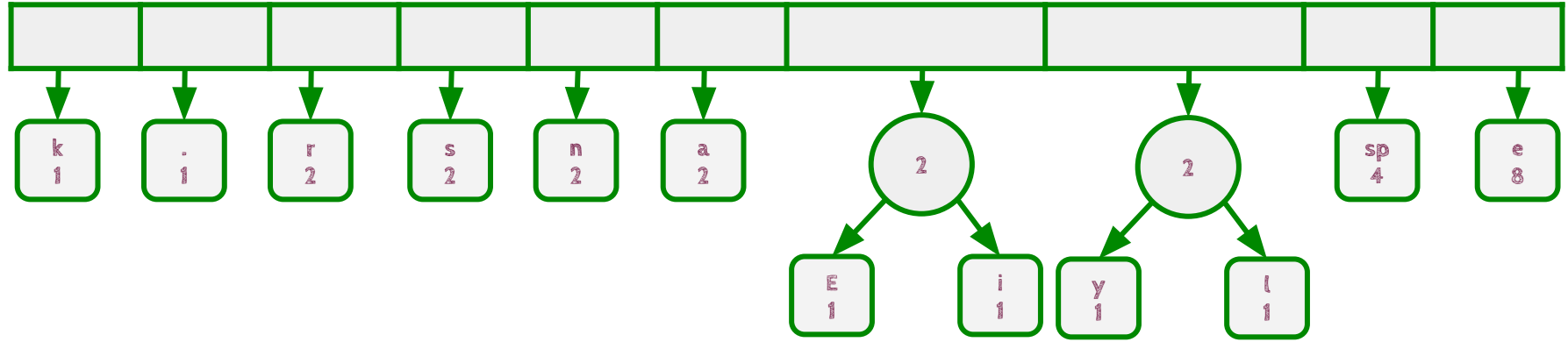


“Eerie eyes seen near lake.”

The diagram illustrates a neural network layer with 10 input nodes and 3 output nodes. The input nodes are arranged in a row at the top, each containing a letter and a subscript (e.g., k₁, .₁, r₂, s₂, n₂, a₂, 2, sp₄, e₈). The output nodes are arranged in a row at the bottom, each containing a letter and a subscript (e.g., y₁, l₁, E₁, i₁). The connections between the input and output nodes are represented by arrows, showing a complex, non-linear mapping.

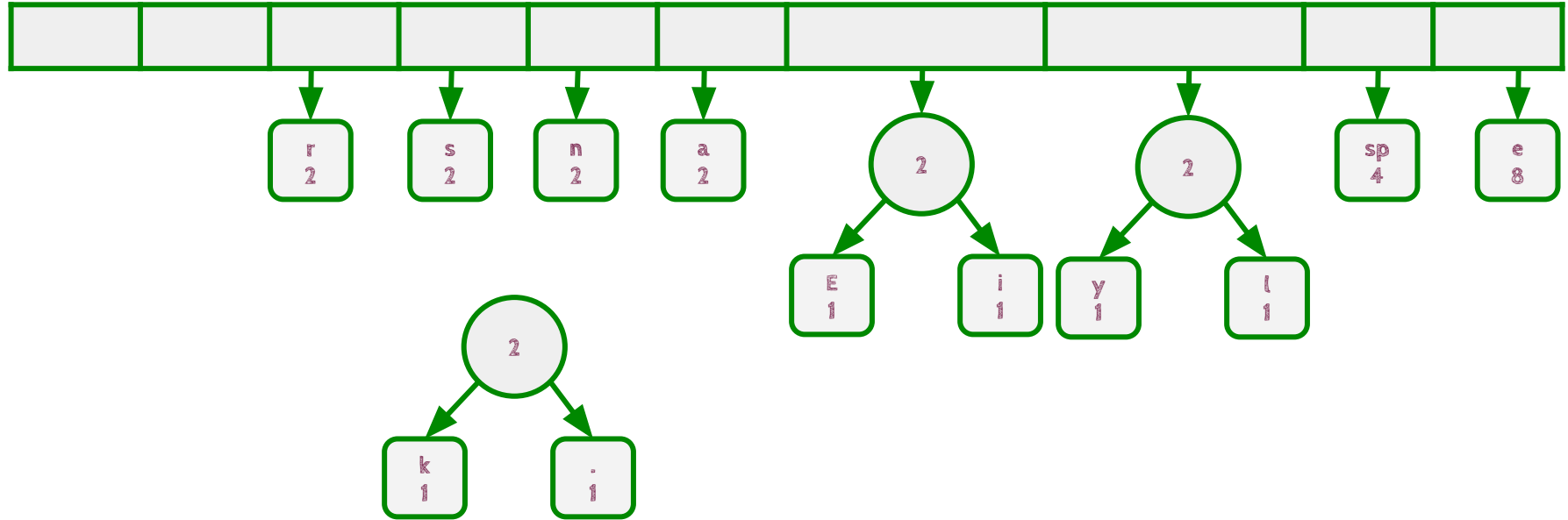
“Eerie eyes seen near lake.”

Statik Huffman Kodlama



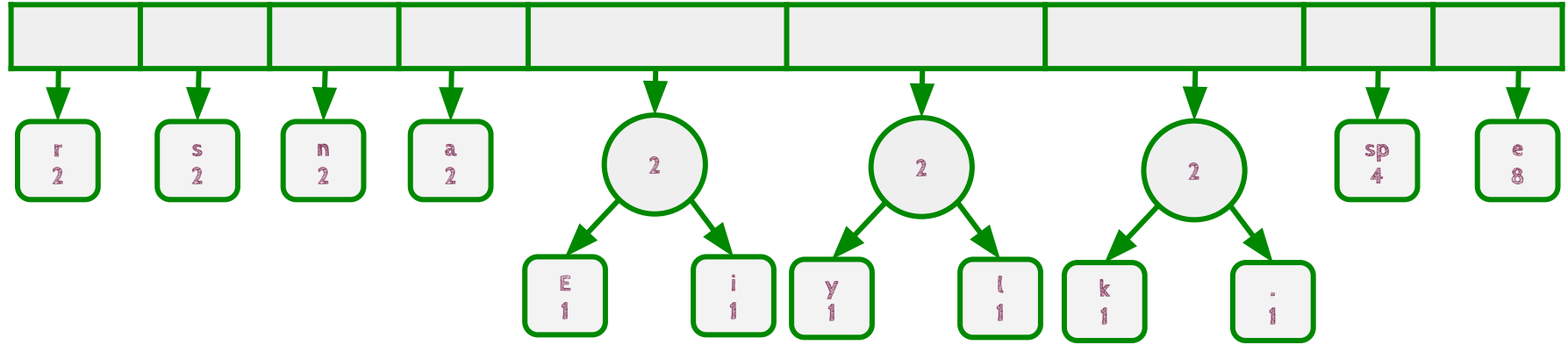
"Eerie eyes seen near lake."

Statik Huffman Kodlama



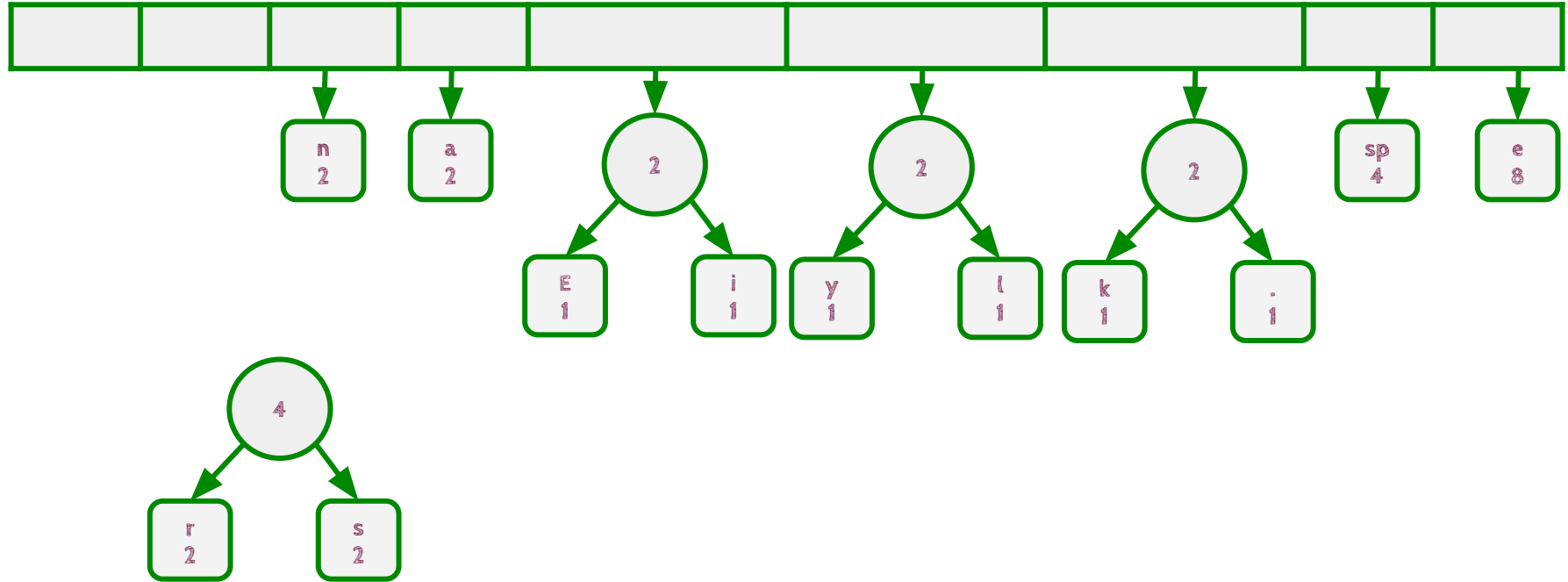
"Eerie eyes seen near lake."

Statik Huffman Kodlama



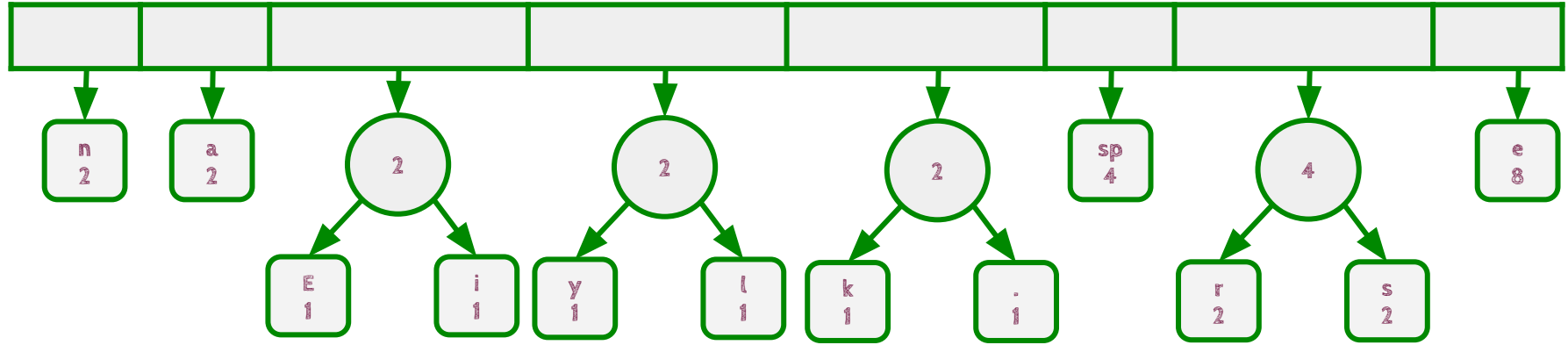
"Eerie eyes seen near lake."

Statik Huffman Kodlama



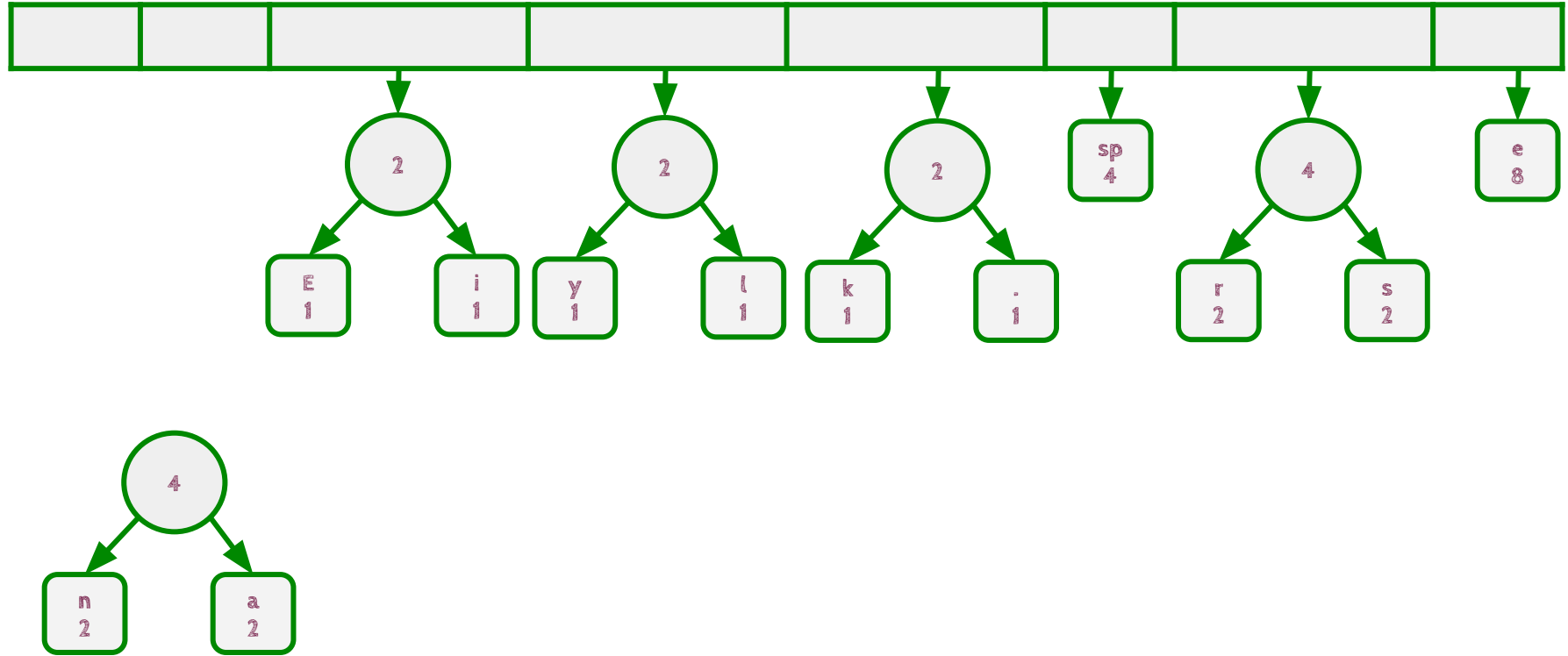
“Eerie eyes seen near lake.”

Statik Huffman Kodlama



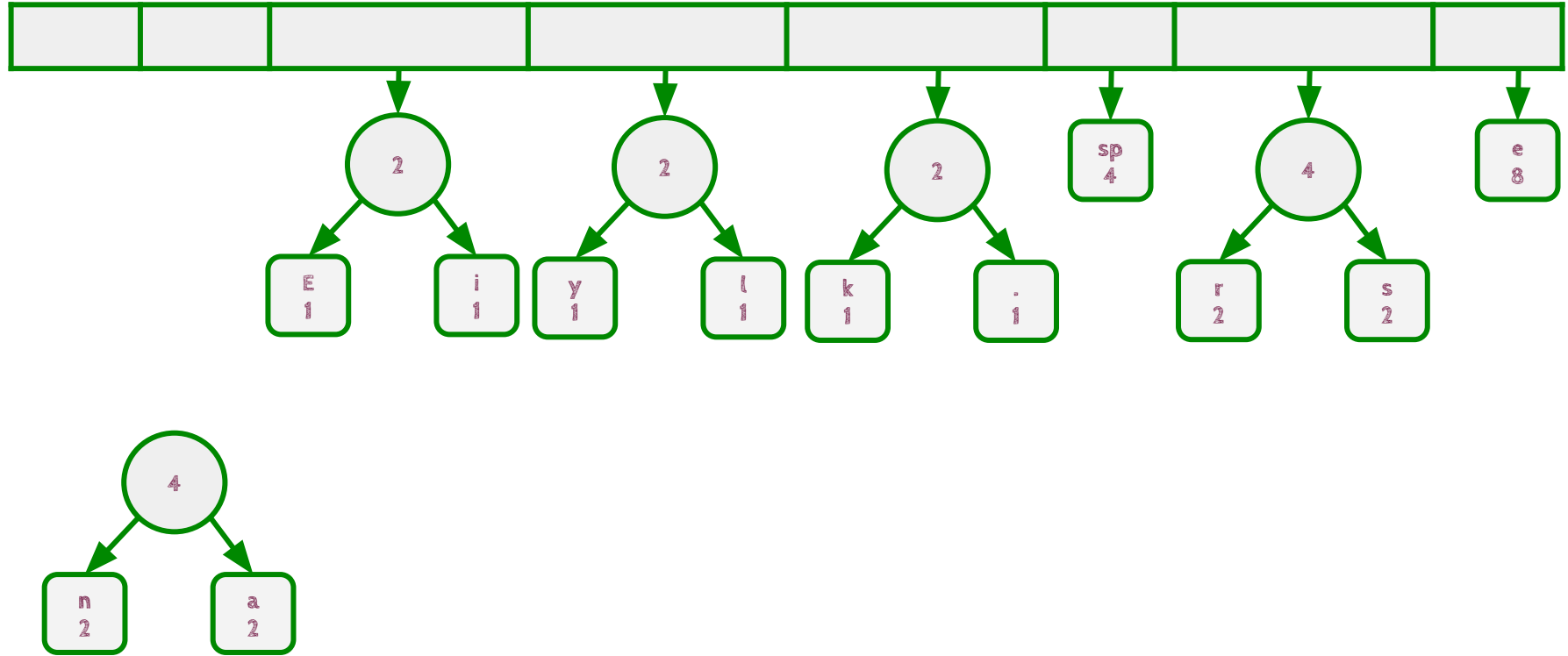
"Eerie eyes seen near lake."

Statik Huffman Kodlama



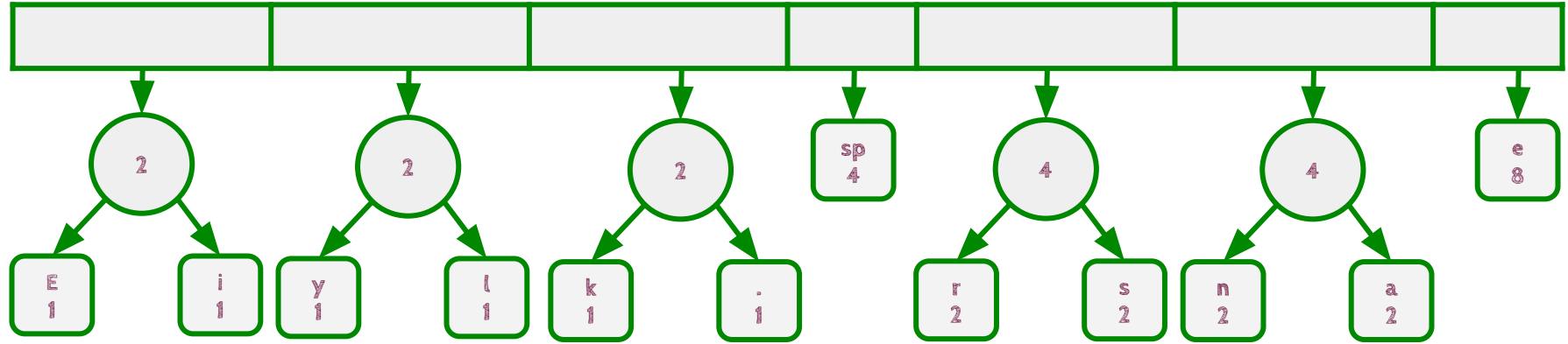
"Eerie eyes seen near lake."

Statik Huffman Kodlama



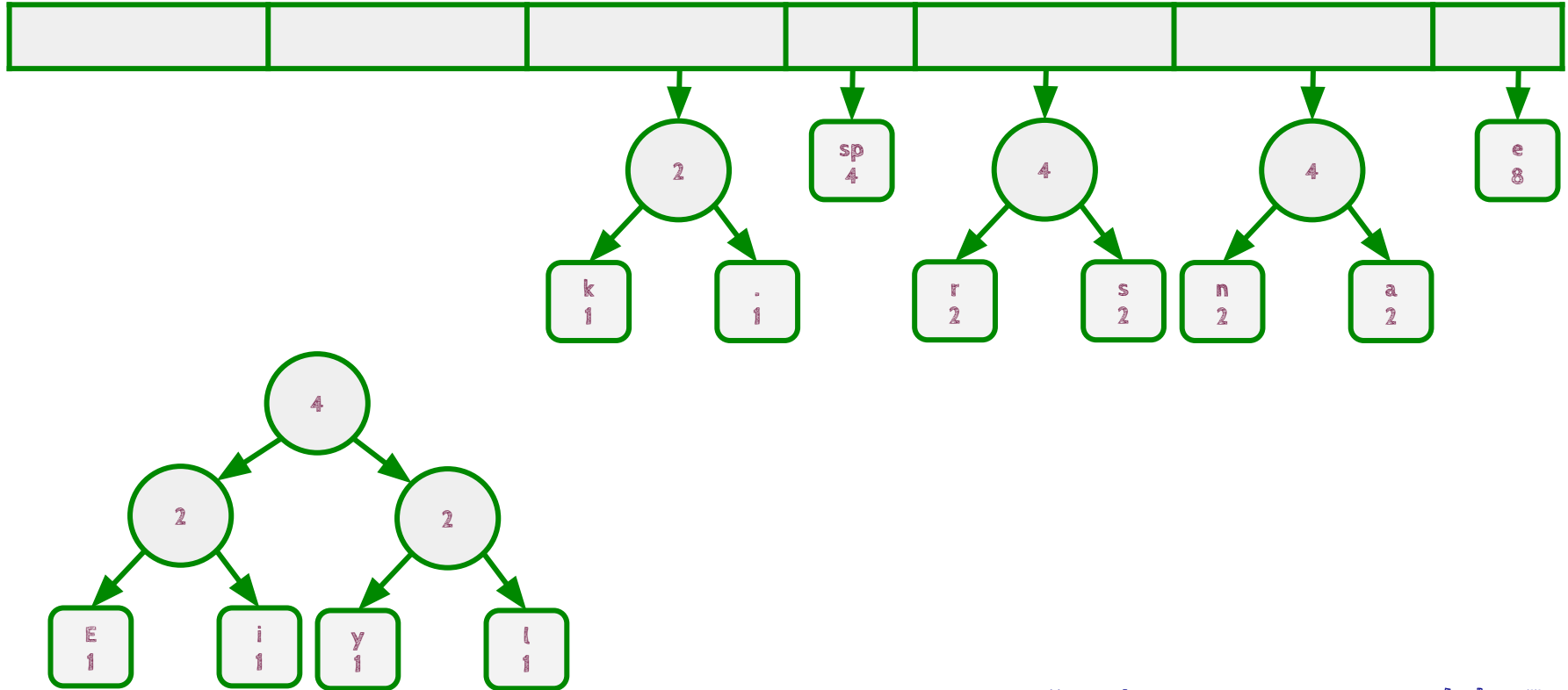
"Eerie eyes seen near lake."

Statik Huffman Kodlama



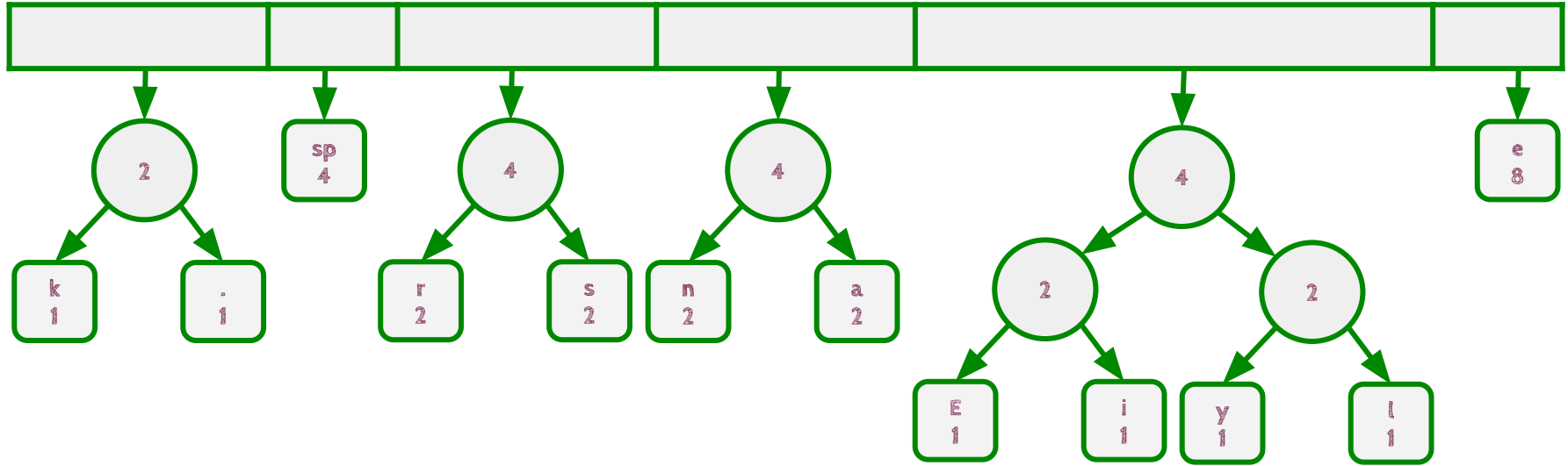
"Eerie eyes seen near lake."

Statik Huffman Kodlama



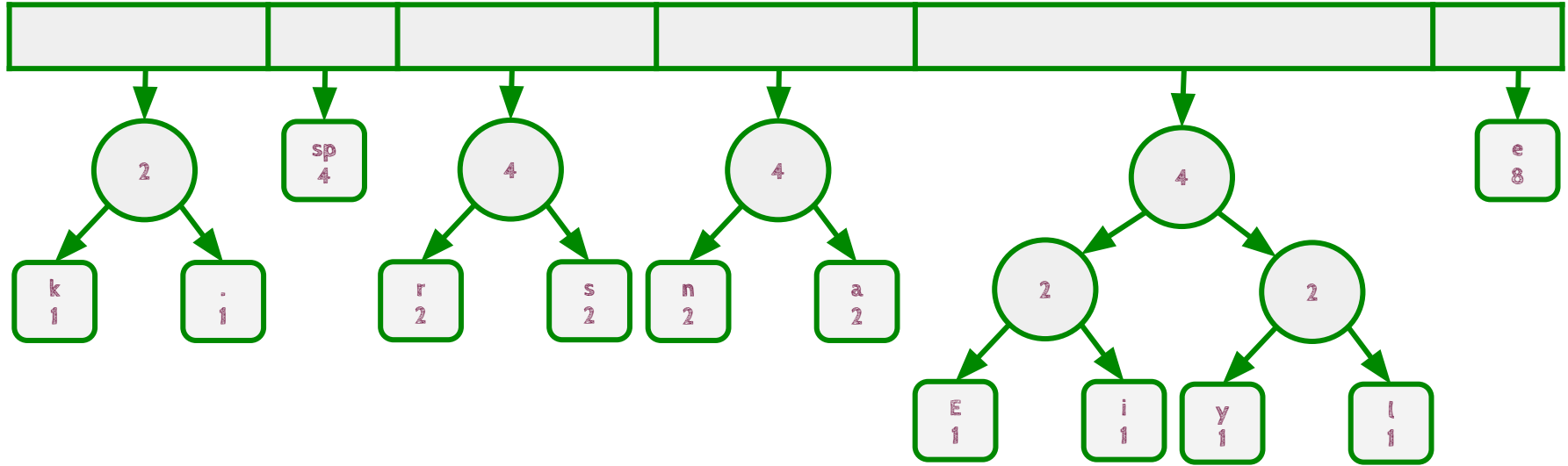
"Eerie eyes seen near lake."

Statik Huffman Kodlama



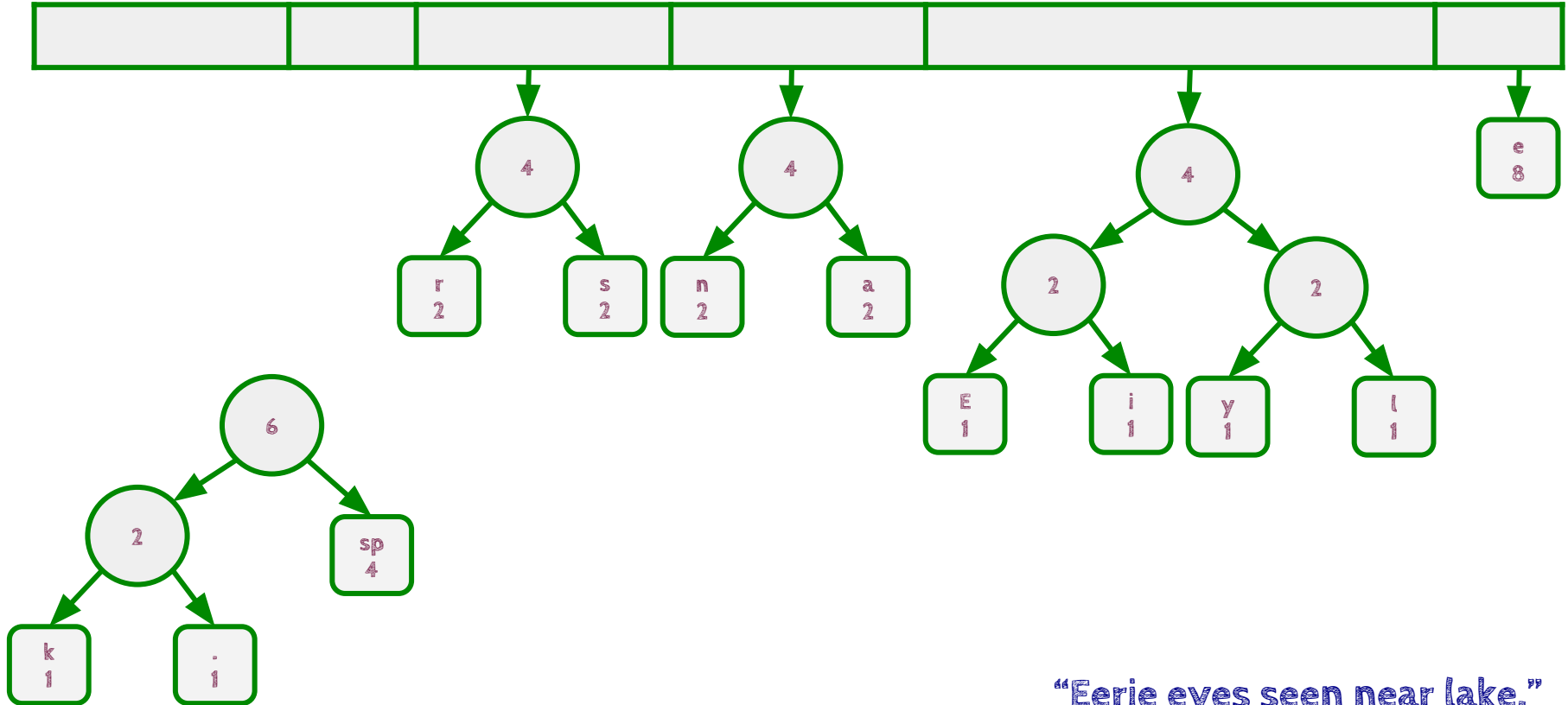
"Eerie eyes seen near lake."

Statik Huffman Kodlama



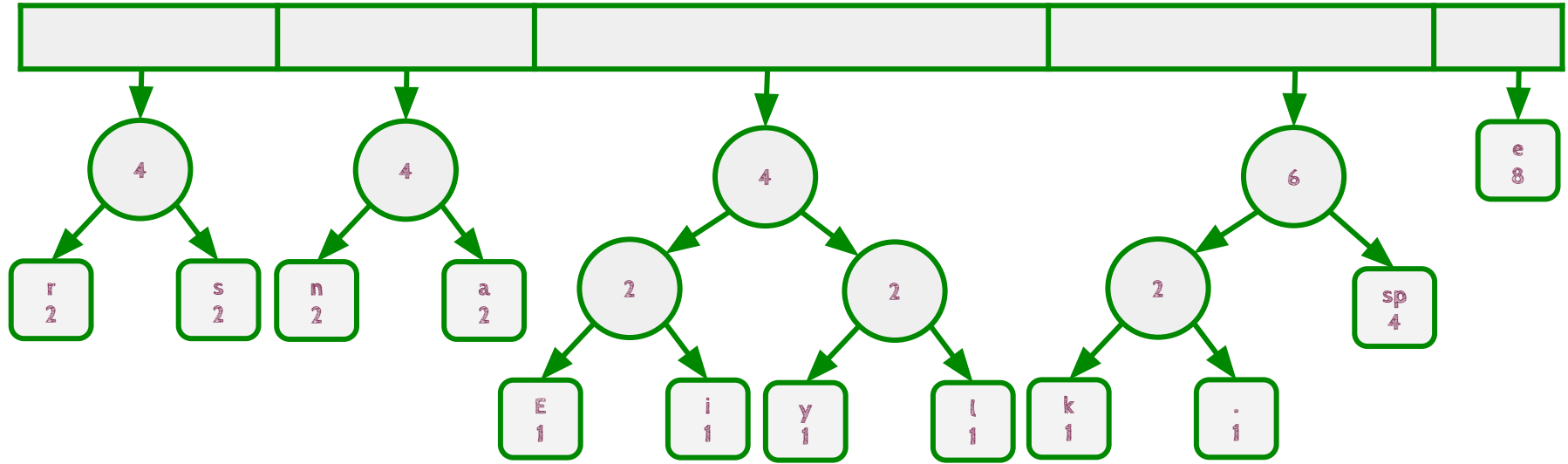
"Eerie eyes seen near lake."

Statik Huffman Kodlama



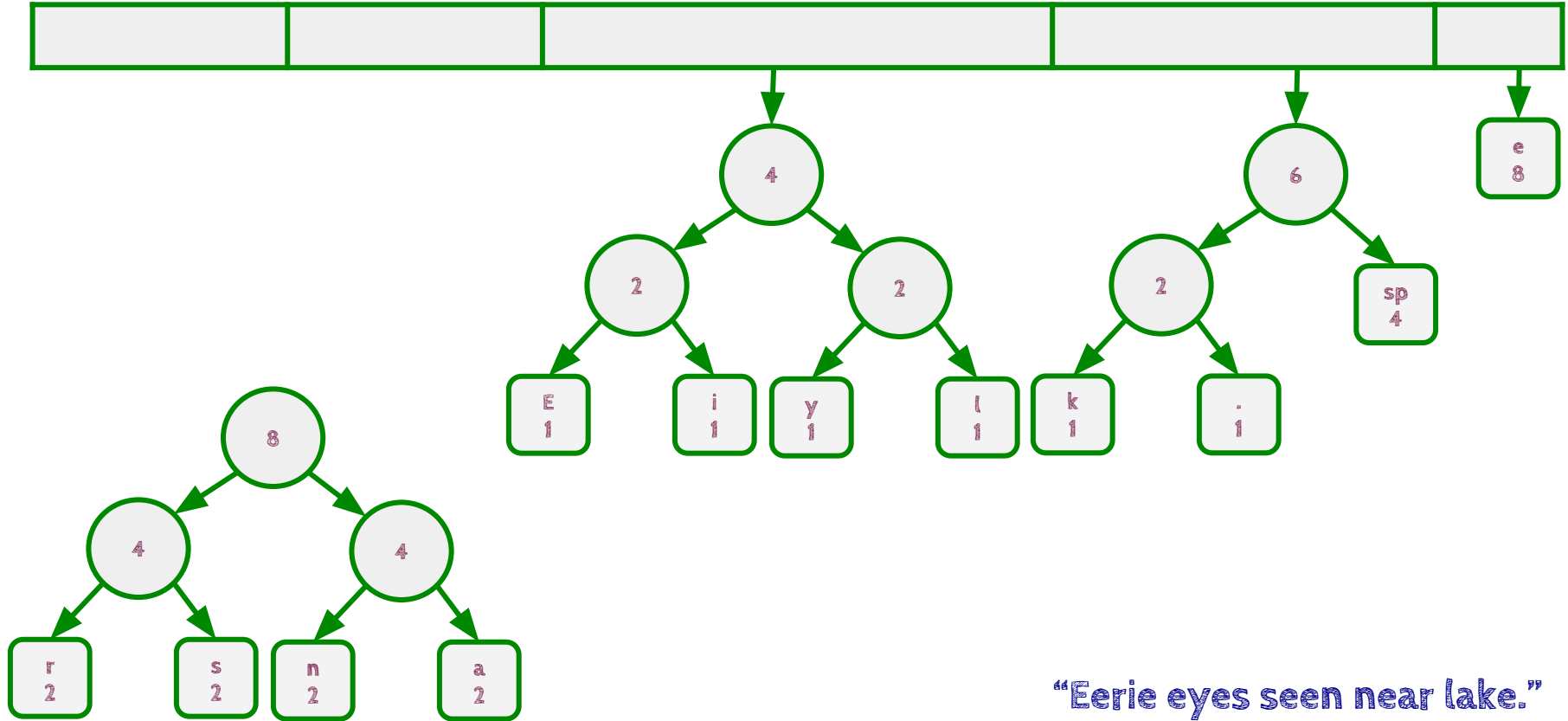
"Eerie eyes seen near lake."

Statik Huffman Kodlama



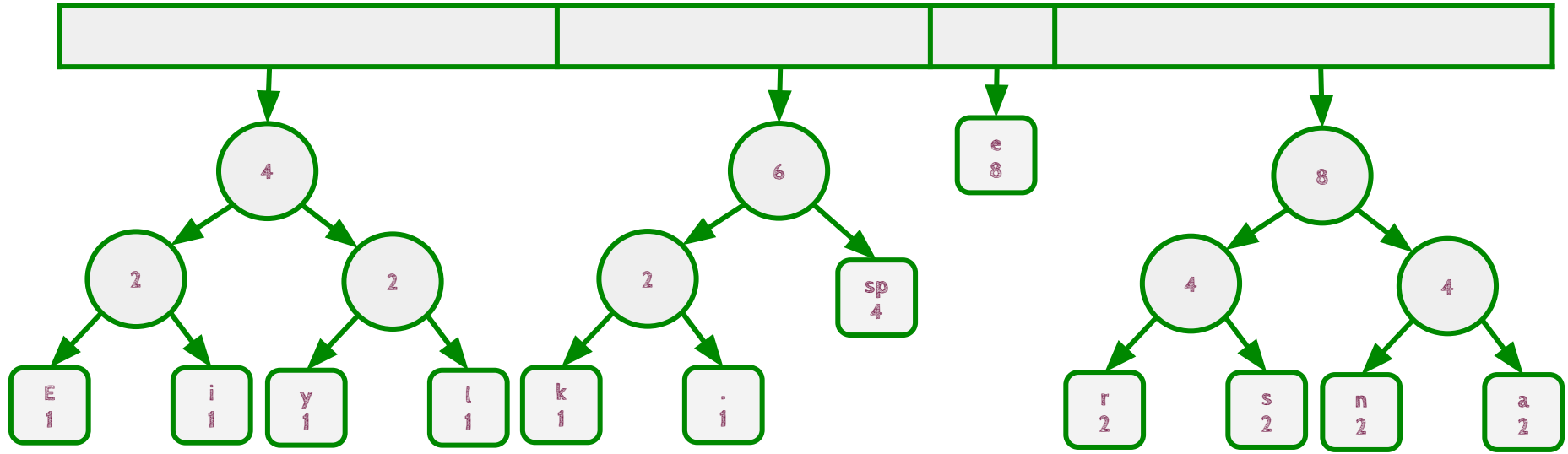
"Eerie eyes seen near lake."

Statik Huffman Kodlama



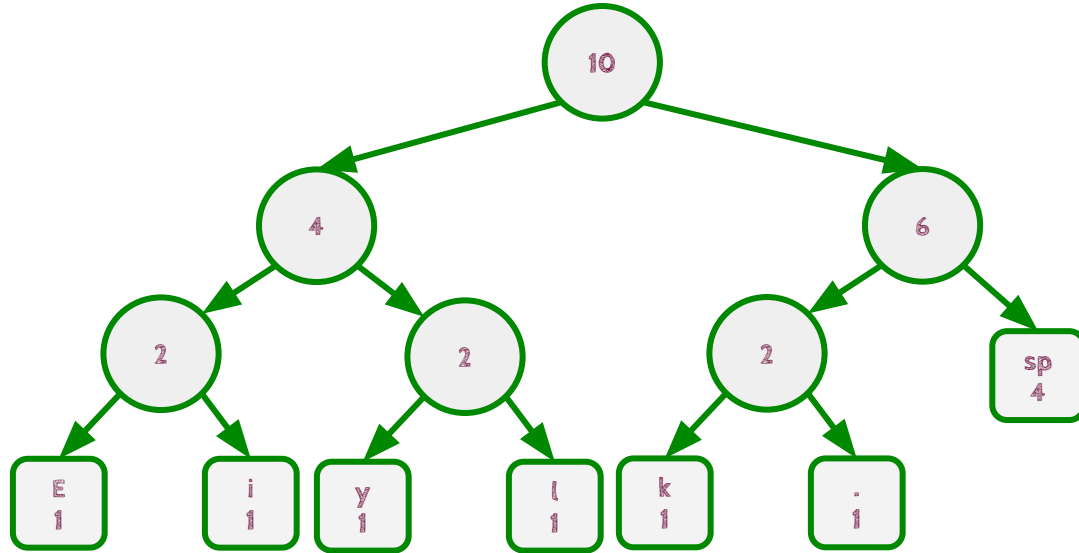
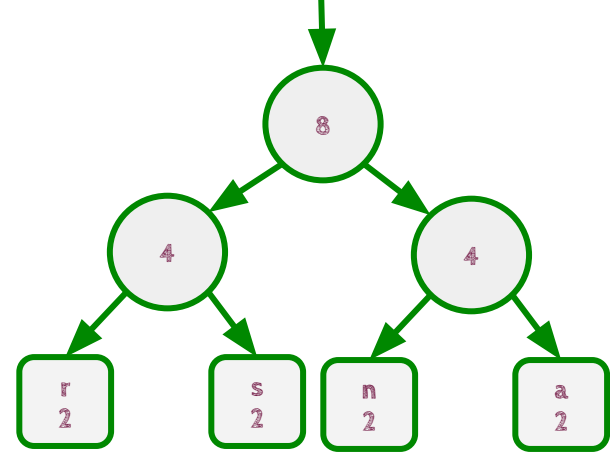
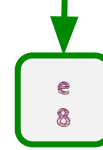
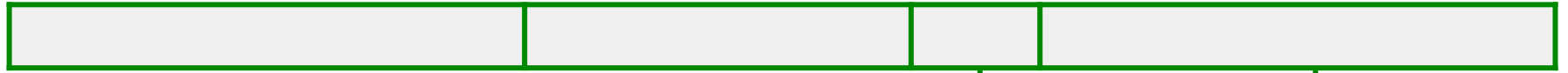
"Eerie eyes seen near lake."

Statik Huffman Kodlama



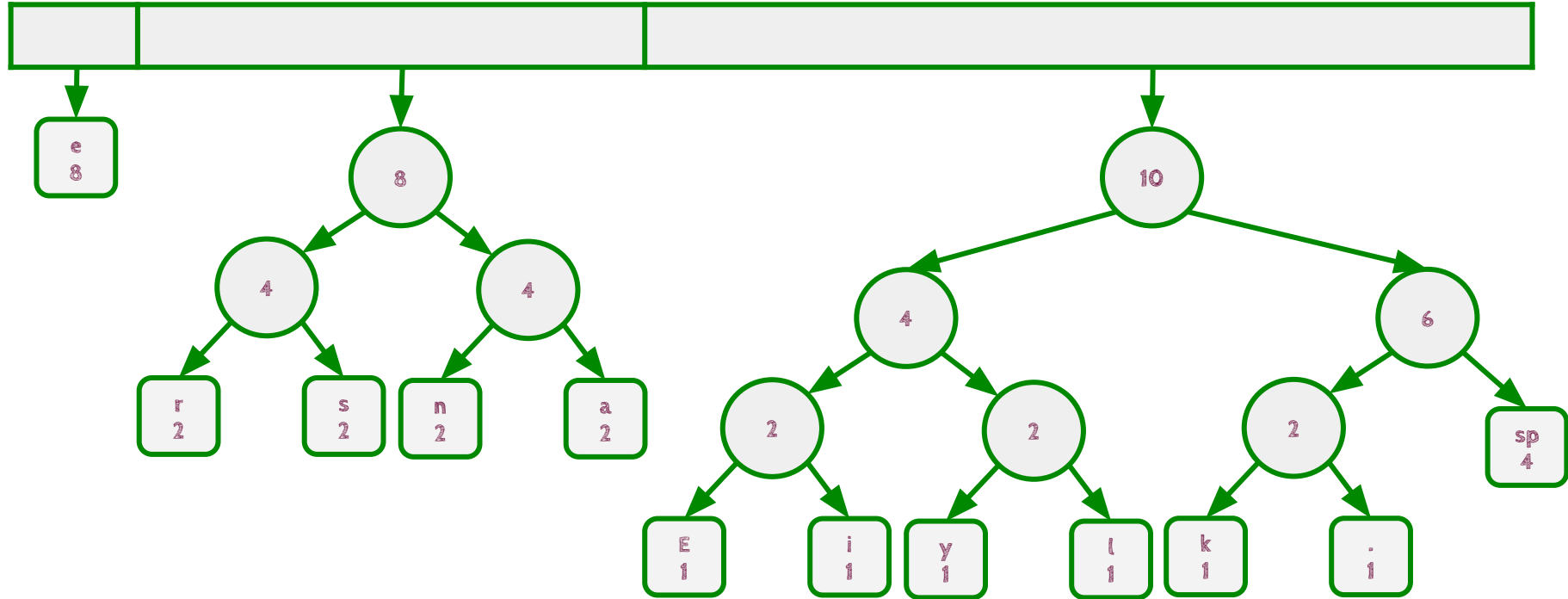
"Eerie eyes seen near lake."

Statik Huffman Kodlama



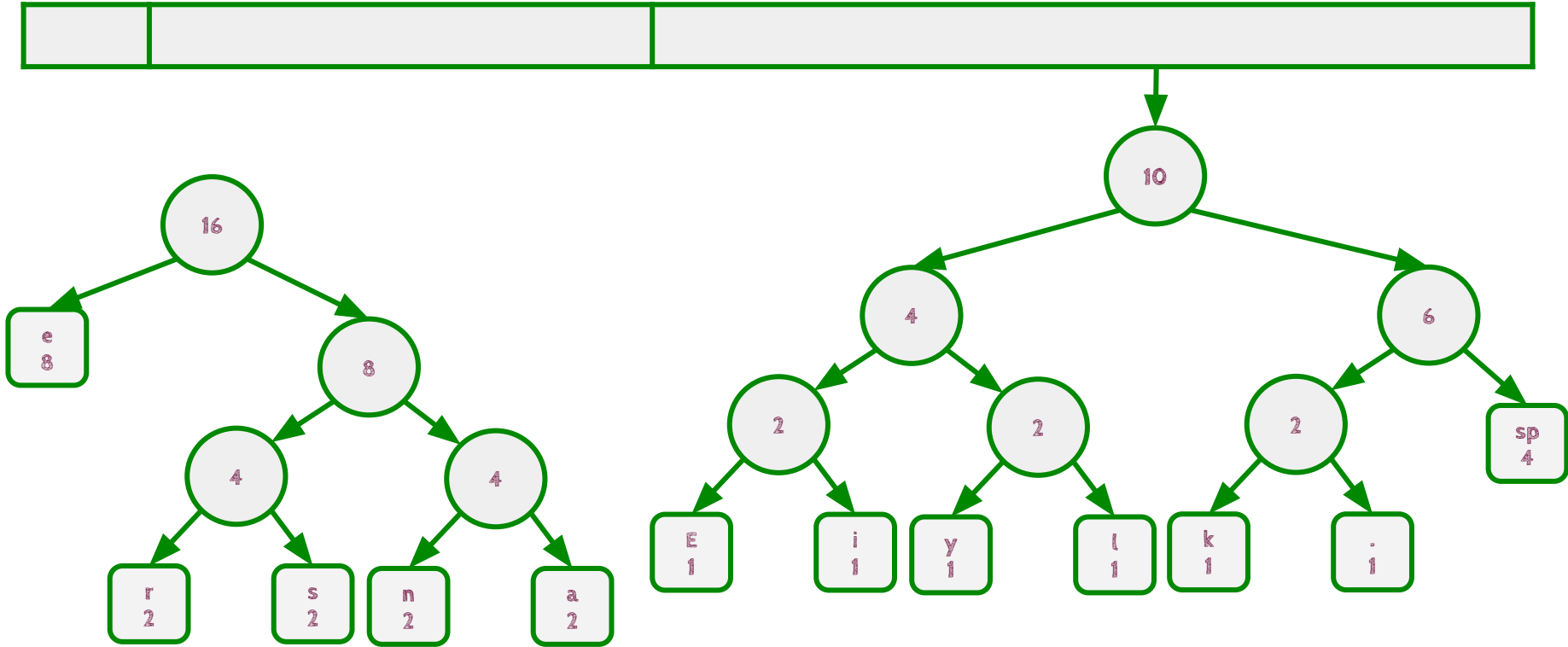
“Eerie eyes seen near lake.”

Statik Huffman Kodlama



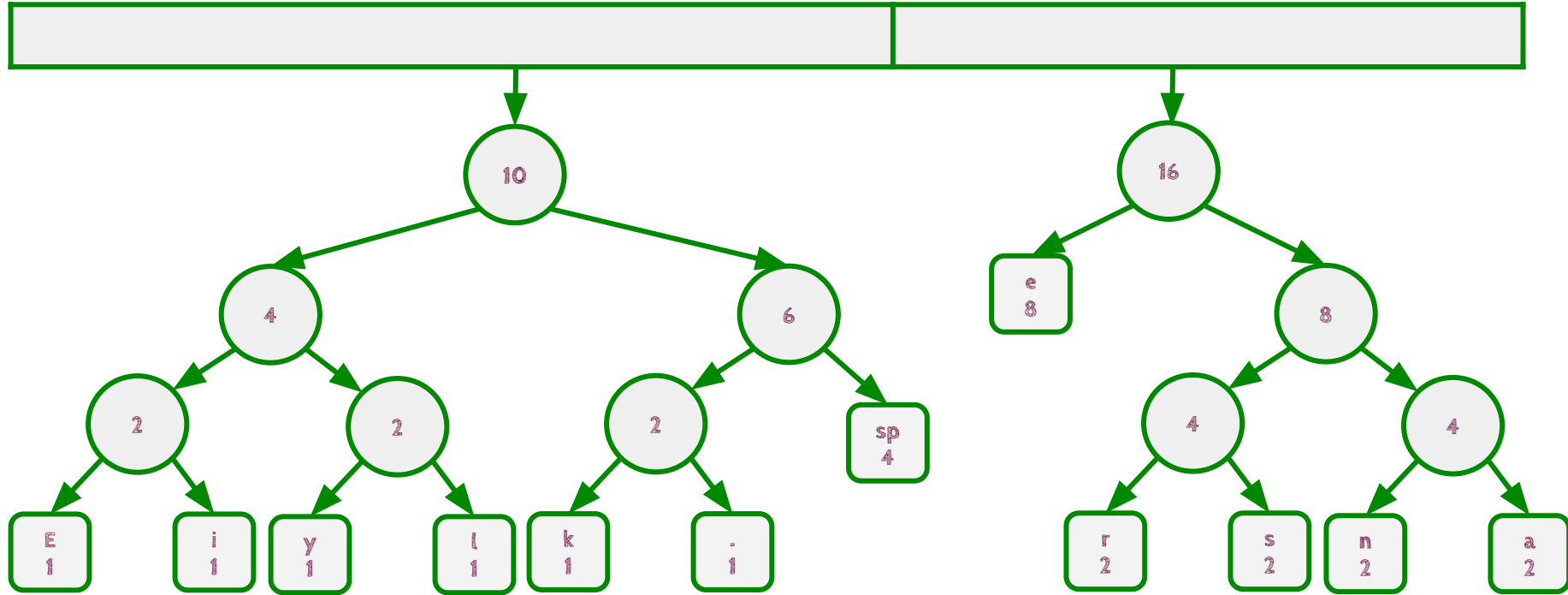
"Eerie eyes seen near lake."

Statik Huffman Kodlama



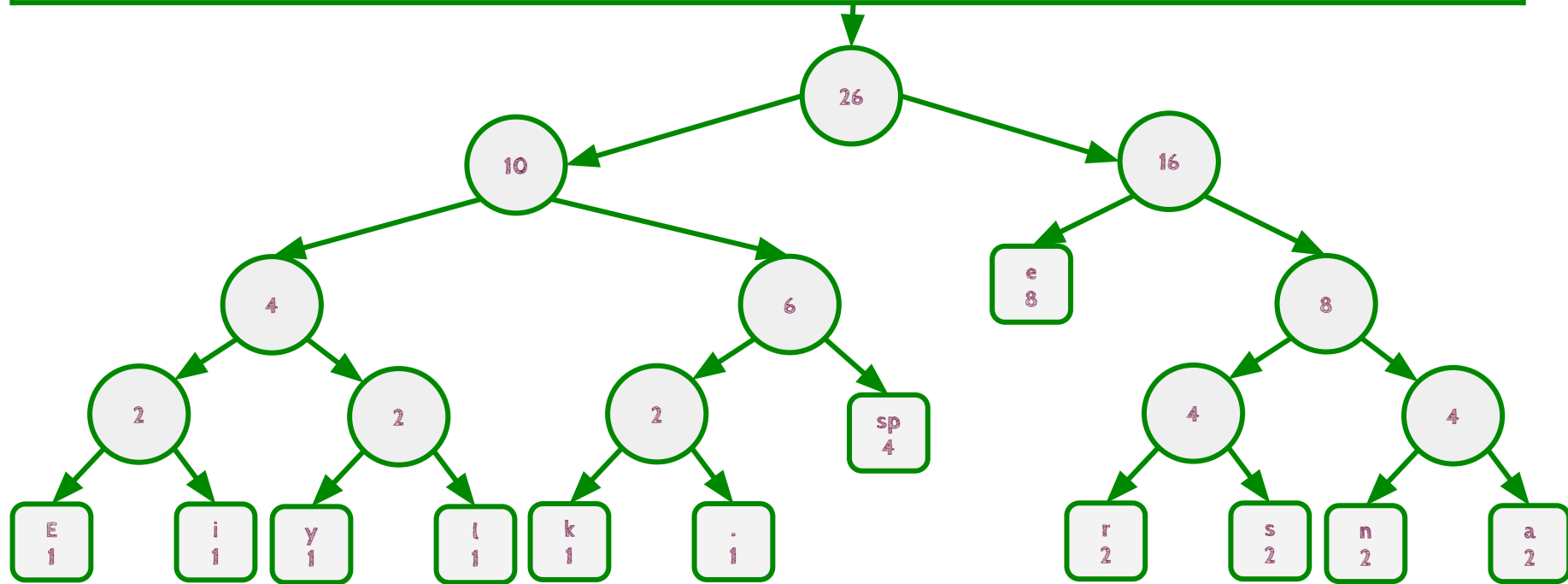
"Eerie eyes seen near lake."

Statik Huffman Kodlama



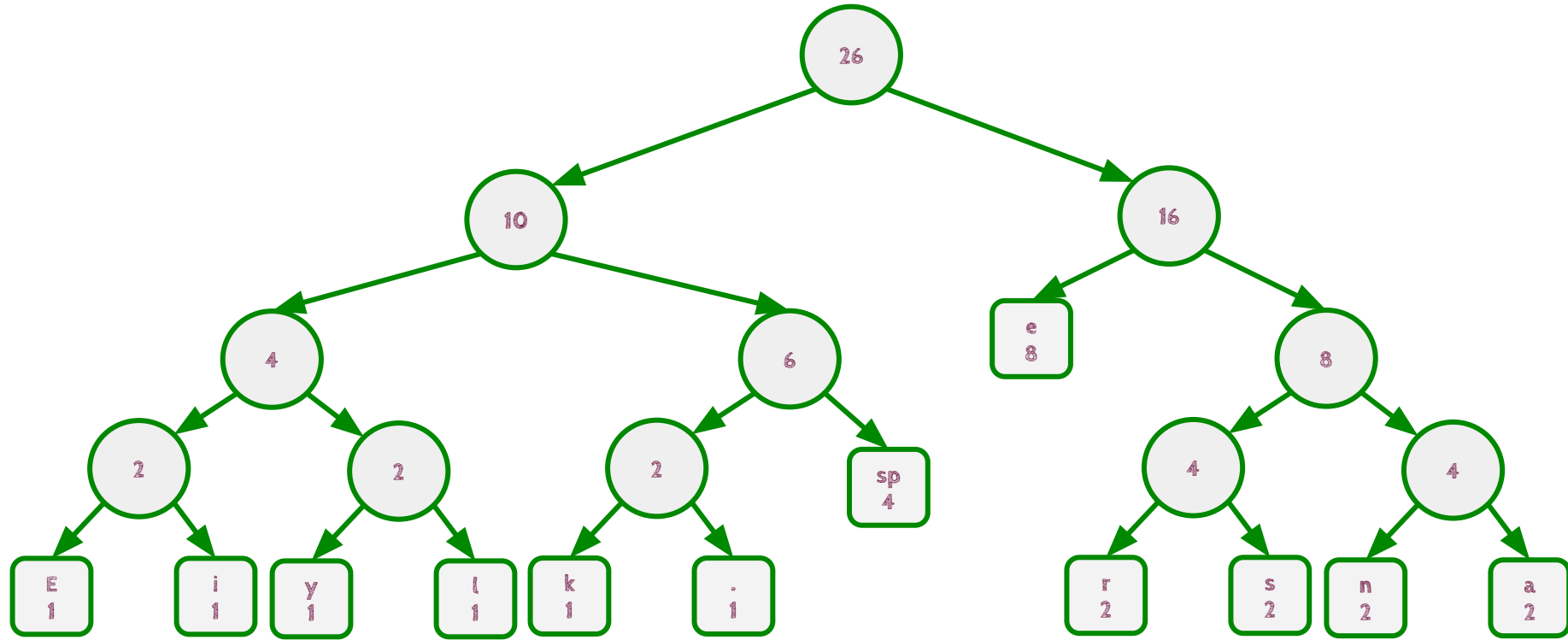
"Eerie eyes seen near lake."

Statik Huffman Kodlama



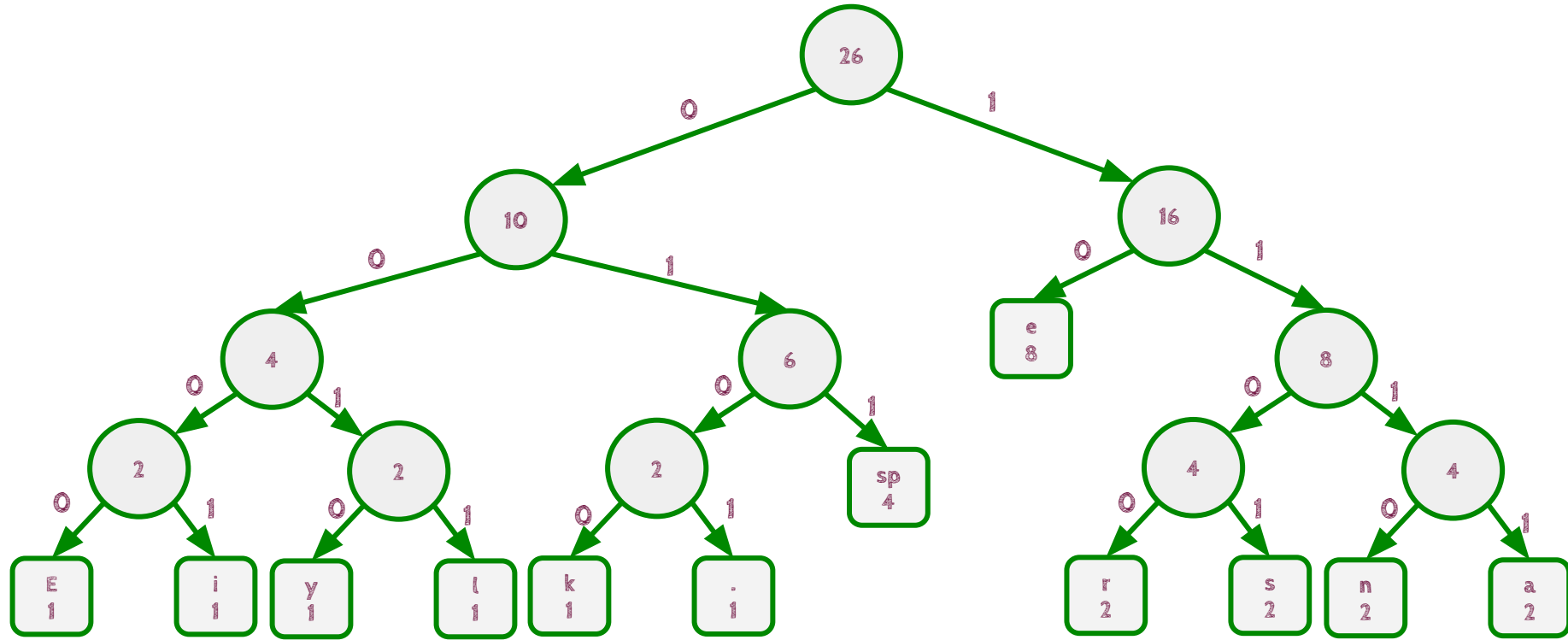
"Eerie eyes seen near lake."

Statik Huffman Kodlama



"Eerie eyes seen near lake."

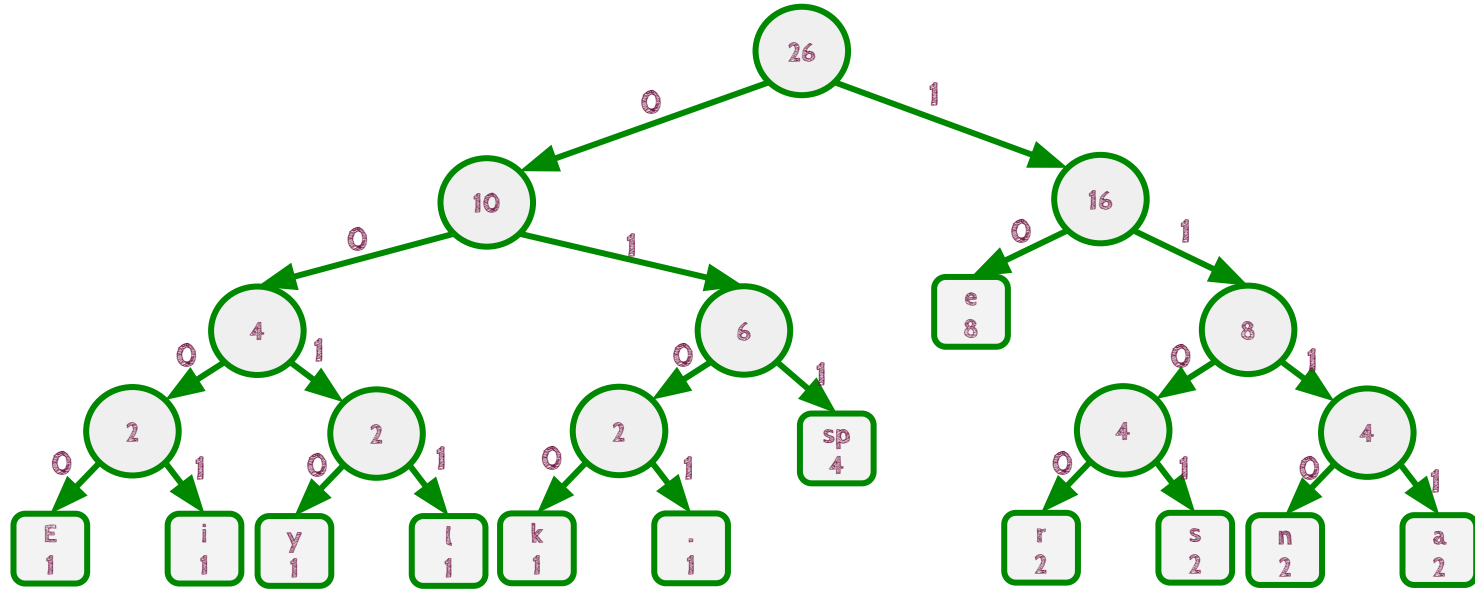
Statik Huffman Kodlama



"Eerie eyes seen near lake."

Statik Huffman Kodlama

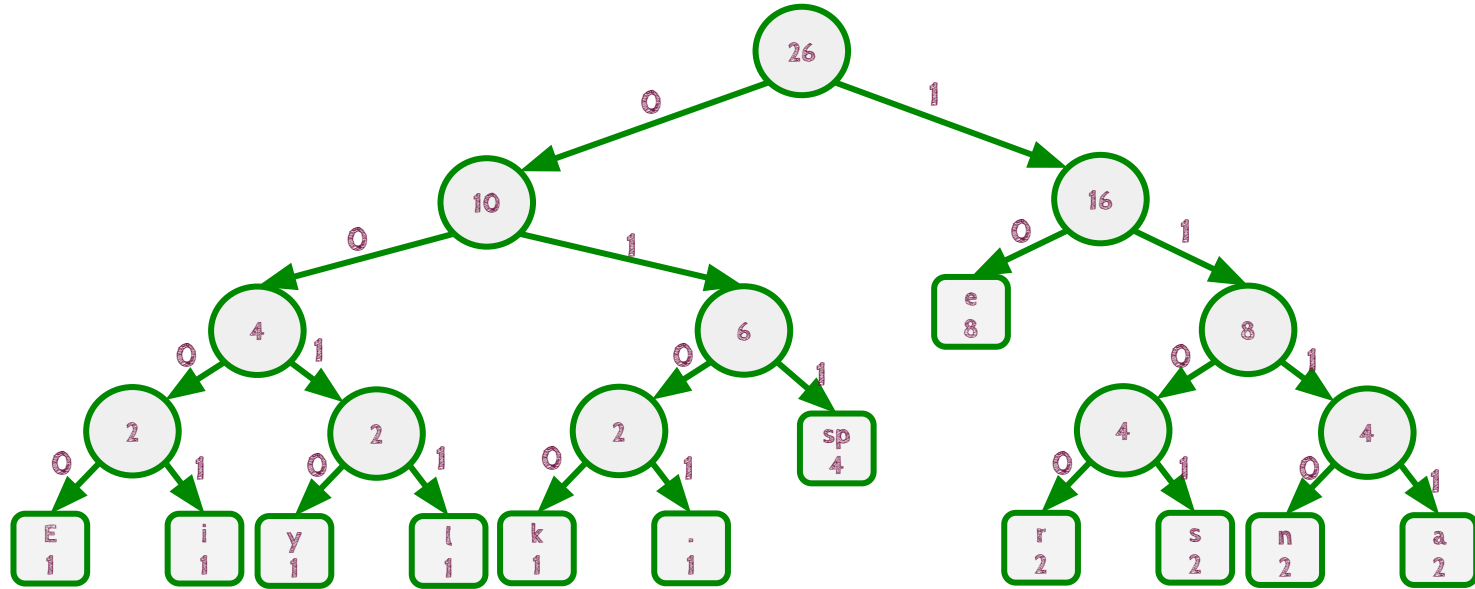
Karakter	Kod
E	0000
i	0001
y	0010
l	0011
k	0100
.	0101
space	011
e	10
r	1100
s	1101
n	1110
a	1111



“Eerie eyes seen near lake.”

Statik Huffman Kodlama

Karakter	Kod
E	0000
i	0001
y	0010
l	0011
k	0100
.	0101
space	011
e	10
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“Eerie eyes seen near lake.”

00001011000000011001110001010110101110110101110101111000110011111010010

Sorular

