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ICS 311
Quiz Solution #6
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Quiz #6:

Calculate the resulting Huffman code for the following character/frequency pairs. [6 pts]

- a. Write the resulting codes in the table's last row.

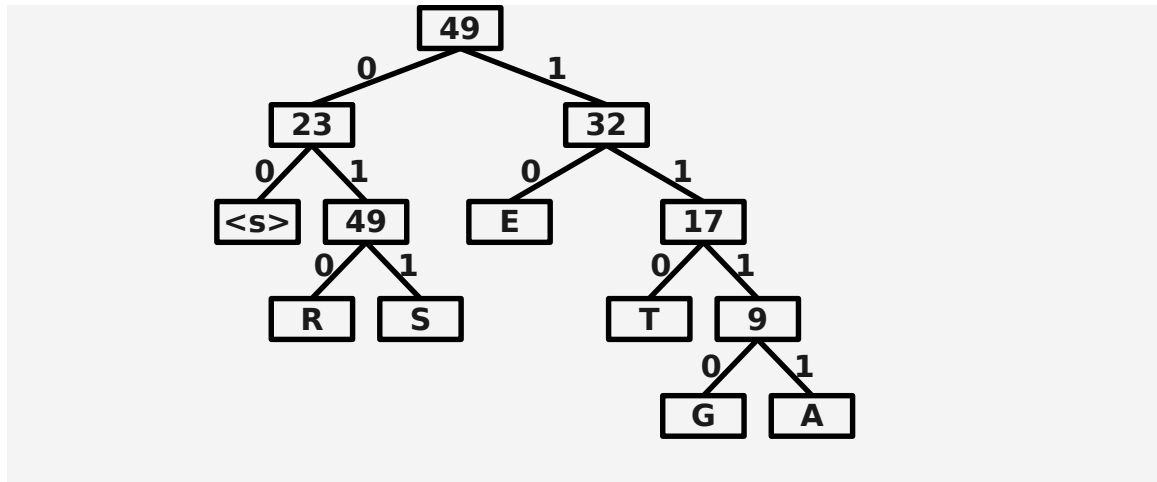
Answer:

Character	A	E	G	R	S	T	<space>
Frequency	5	15	4	6	7	8	10
Huffman	1111	10	1110	010	011	110	00

- b. Show the priority queue created initially and which items are dequeued and which items are enqueued the process.

Answer:

Queue	G	A	R	S	T	<s>	E
Queue	R	S	T	(G,A)	<s>	E	
Queue	T	(G,A)	<s>	(R,S)	E		
Queue	<s>	(R,S)	E	(T,(G,A))			
Queue	E	(T,(G,A))		(<s>,(R,S))			
Queue	(<s>,(R,S))		(E,(T,(G,A)))				
Queue	((<s>,(R,S)),(E,(T,(G,A))))						
Queue	∅						



c. What would be the encoding of the phrase “ester egg”?

Answer:

10 1111 011 110 10 010 00 10 1110 1110

How many times is the print statement executed in the code below?

[6 pts]

```

for i = 1 to n
    for j = 1 to i
        print i, j
    end for
end for
  
```

Answer:

$$\begin{aligned}
 Result &= 1+2+3+4+\dots+n \\
 &= \sum_{i=1}^n i \\
 &= \frac{n(n+1)}{2}
 \end{aligned}$$

What is the time complexity (Θ) of the statements above? Briefly justify your answer. [2 pts]

Answer:

$\Theta(n^2)$. Assume there exists positive constants c_1 , c_2 , and n_0 , such that $0 \leq c_1 n^2 \leq n(n+1)/2 \leq c_2 n^2$ holds for all $n \geq n_0$. Let's pick $c_1 = 0.5$, $c_2 = 1$, and $n_0 = 2$. Obviously, the in-equation holds.