

CS 5/7350

Quiz #2 Due Feb 22 for Completion Grade

Name & ID: _____

1. [1.5 pts] Determine a Huffman encoding for each symbol in a message that contains:

_____ 20 As,
 _____ 20 Bs,
 _____ 7 Ds,
 _____ 7 Es,
 _____ 3 Fs,
 _____ 3 Gs,
 _____ 2 Hs
 _____ 2 Ks

How many bits are in the entire message if each symbol is encoded with 3 bits?

How many bits are in the entire Huffman coded message?

2. [2 pts] You run different programs for various values of “n” and create 4 tables of the runtimes. Give the Asymptotic bounds that each of the tables support?

a.	n	time(ms)	b.	n	time(ms)	c.	n	time(ms)	d.	n	time(ms)
	1000	2120		1000	58913		100	21564		52	20
	2000	4120		2000	60913		200	81564		53	60
	3000	6120		4000	62913		300	181564		54	180
	4000	8120		8000	64913		400	321564		55	540
	5000	10120		16000	66913		500	501564		56	1620
	6000	12120		32000	68913		600	721564		57	4860
	7000	14120		64000	70913		700	981564		58	14580
	8000	16120		128000	72913		800	1281564		59	43740
	9000	18120		256000	74913		900	1621564		60	131220
	10000	20120		512000	76913		1000	2001564		61	393660

3. [1 pts] What is $(- \frac{1}{4})$ modulo 7?
4. [1 pts] Two people need to establish a secret key for encrypting communications. They agree to use a Diffie-Hellman key exchange with a modulus of 11 and decide on 2 as the base. Person A chooses a random value performs the appropriate computations and sends the value 6 to person B. Person B chooses a random value of 3 and performs the appropriate computations:
- What is the value Person B sends to Person A
 - What is the shared secret key between Person A and Person B