

CSCE 221 Cover Page Homework

#1 Due September 18 at midnight to CSNet

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Please list all sources in the table below including web pages which you used to solve or implement the current homework. If you fail to cite sources you can get a lower number of points or even zero. According to the University Regulations, Section 42, scholastic dishonesty are including: acquiring answers from any unauthorized source, working with another person when not specifically permitted, observing the work of other students during any exam, providing answers when not specifically authorized to do so, informing any person of the contents of an exam prior to the exam, and failing to credit sources used. Disciplinary actions range from grade penalties to expulsion read more: Aggie Honor System Office

Type of sources			
People	Brady Skuza	Hasnain Bilgrami	
Web pages (provide URL)			
Printed material			
Other Sources			

I certify that I have listed all the sources that I used to develop the solutions/codes to the submitted work.

“On my honor as an Aggie, I have neither given nor received any unauthorized help on this academic work.”

Your Name: Kevin Chou

Date: 9/18/2015

1c.

$$n=2^k$$

$$\text{formula} = \log_2(n)+1$$

(i).

Range [1...n]	True answer n	# of guesses/comparison	Result of formula in (c)
[1,1]	1	1	1
[1,2]	2	2	2
[1,4]	4	3	3
[1,8]	8	4	4
[1,16]	16	5	5
[1,32]	32	6	6
[1,64]	64	7	7
[1,128]	128	8	8
[1,256]	256	9	9
[1,512]	512	10	10
[1,1024]	1024	11	11
[1,2048]	2048	12	12

(ii).

Modified formula: $\log_2(n)$

Range [1...n]	True answer n	# of guesses/comparison	Result of formula in (d)
[1,1]	1	0	1
[1,3]	3	1	2
[1,5]	5	2	3
[1,7]	7	3	4
[1,15]	15	4	5
[1,31]	31	5	6
[1,63]	63	6	7
[1,127]	127	7	8
[1,255]	255	8	9
[1,511]	511	9	10
[1,1023]	1023	10	11
[1,2047]	2047	11	12

1d.

Big O notation: $O(\log_2(n))$

3.

```
remove( ) {  
    if (last element is one being removed)  
        then remove last element  
    else {  
        read last element of the vector  
        write it over the element being removed  
    }  
    remove the last element  
}
```

4.

It is possible for Al's algorithm to be slower than Bob's when n is less than 100 because the Big-O notation shows the behavior of the function at the end.

5.

- a) $n/2$
- b) n^2
- c) n^2