

3 Networking Questions

Shuyan Sun (ss1316)

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1 Bit Stuffing.

- a. 01111110 1000111110101000111110011 01111110
- b. 11111110001111111

2 Hamming Code.

- a. 011000111011
- b.
 - i. p1 and p8 both indicate error, thus changing the ninth bit. The message turns to 111000100011.
 - ii. p1, p4 and p8 indicate error, thus changing the eleventh bit. The message turns to 01110011010.

3 CRC Code.

- a. $C(x)=10101$, $m(x)*x^4 \bmod C(x)=1111$. Thus, encoded message is 101101111.
- b.
 - i. Using $110101110 \bmod 1111$, and the remainder is 10. The received message is incorrect.
 - ii. Using $110101100 \bmod 1111$, and the remainder is 0. The received message is correct.

4 Distance Vector Routing.

Destination	Cost	Next Hop
A	9	D
B	5	B
C	0	/
D	5	D
E	4	E
F	9	E

5 TCP Sequence Numbers.

$$lifetime = \frac{2^{64} \times 2^3}{100 \times 2^{40}} = \frac{2^{27}}{100} s = 1342177.28s = 15.53days$$

6 DNS.

7 Internet Services

Domain Name: DUKE.EDU

Registrant:

Duke University
905 W. Main Street, Suite 18B
Suite 2106
Durham, NC 27701
USA

Administrative Contact:

Domain Administrator
Duke University
334 Blackwell St.
Suite 2106
Durham, NC 27701
USA

+1.9196845300
datacon-hostmaster@duke.edu

Technical Contact:

Domain Administrator
Duke University
334 Blackwell St.
Suite 2106
Durham, NC 27701
USA

+1.9196842200
datacon-hostmaster@duke.edu

Name Servers:

DNS-NC1-01.OIT.DUKE.EDU
DNS-AUTH-01.OIT.DUKE.EDU
DNS-AUTH-02.OIT.DUKE.EDU

Domain record activated: 02-Jun-1986

Domain record last updated: 02-Jun-2021

Domain expires: 31-Jul-2024

```
HTTP/1.1 200 OK
Date: Wed, 23 Feb 2022 14:10:10 GMT
Server: Apache
Upgrade: h2,h2c
Connection: Upgrade
Last-Modified: Fri, 08 Feb 2019 18:43:41 GMT
Accept-Ranges: bytes
Content-Length: 2360
Cache-Control: max-age=21600
Expires: Wed, 23 Feb 2022 20:10:10 GMT
Vary: Accept-Encoding
host-header: c2hhcmVklmJsdVob3NOLmVobQ==
X-Endurance-Cache-Level: 3
X-nginx-cache: WordPress
Content-Type: text/plain
```



```
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X-nginx-cache: WordPress
Content-Type: text/plain
```



```
vcm@vcm-24317:~$
```