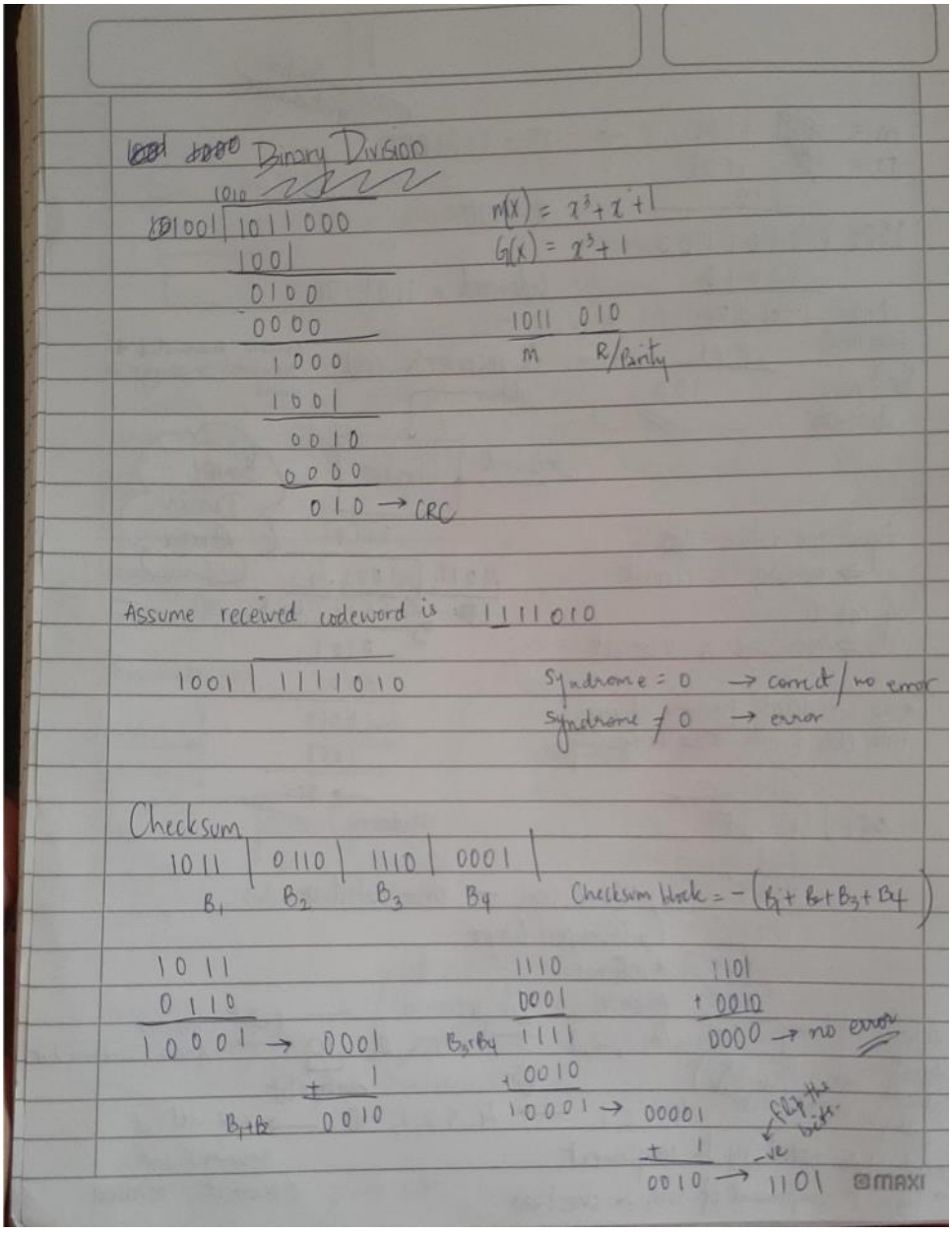
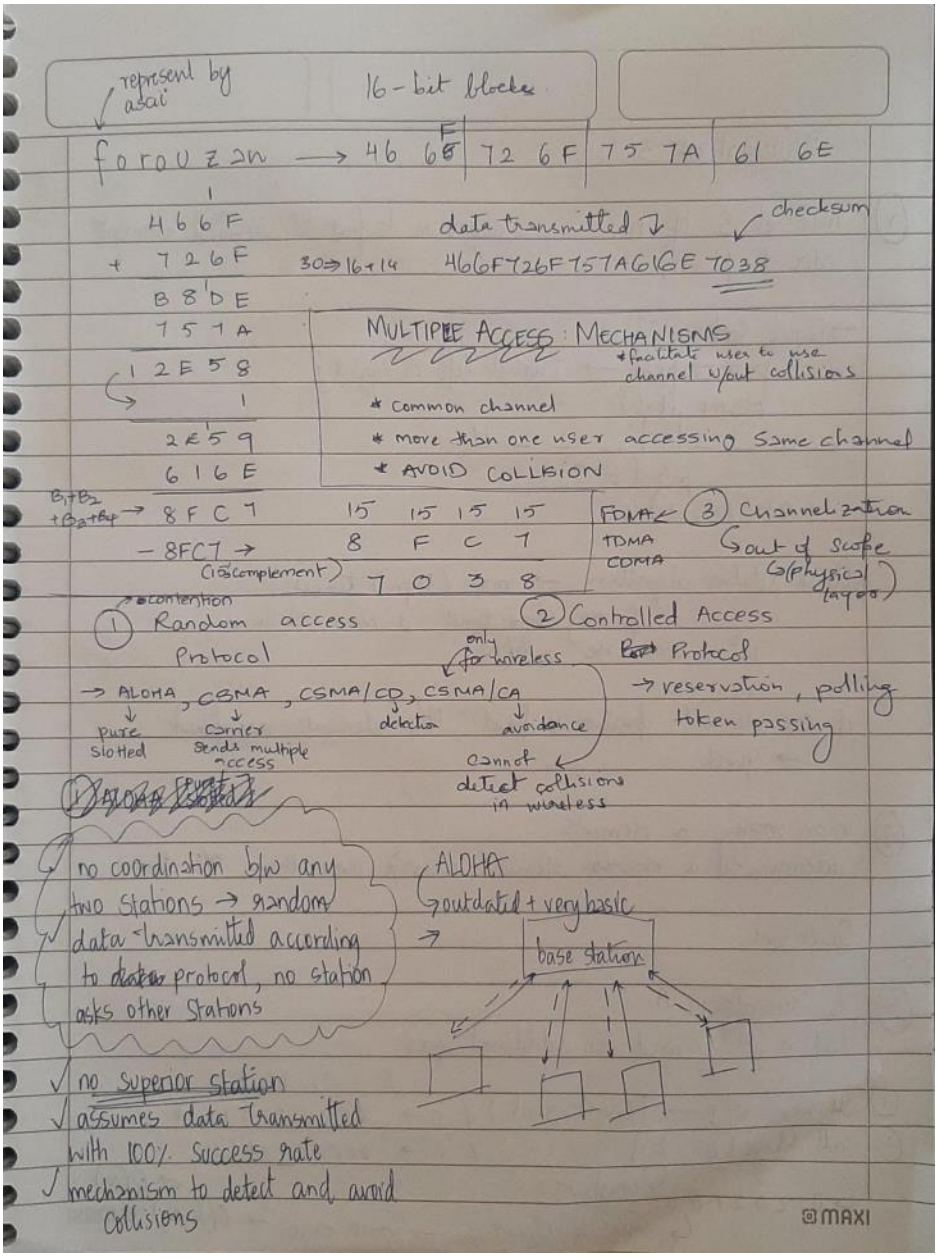
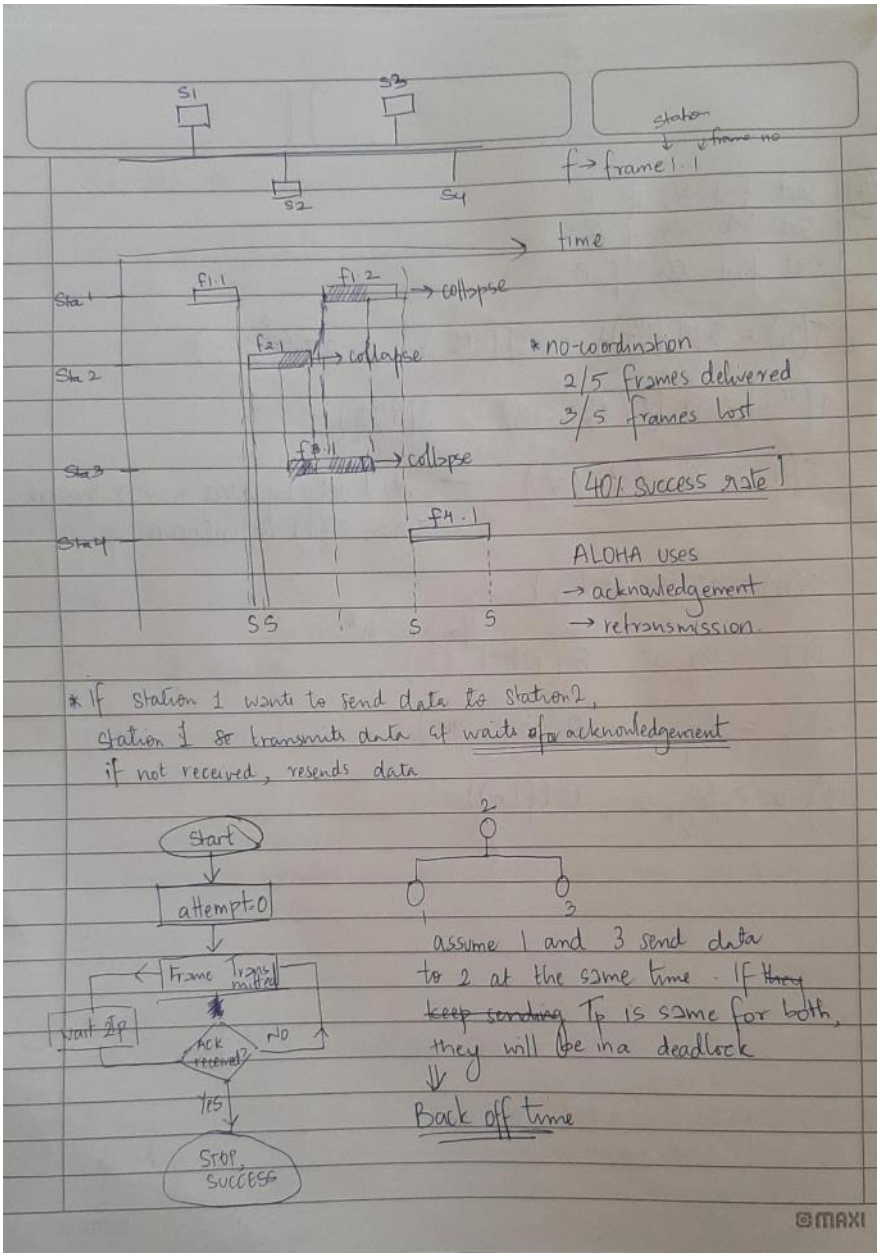
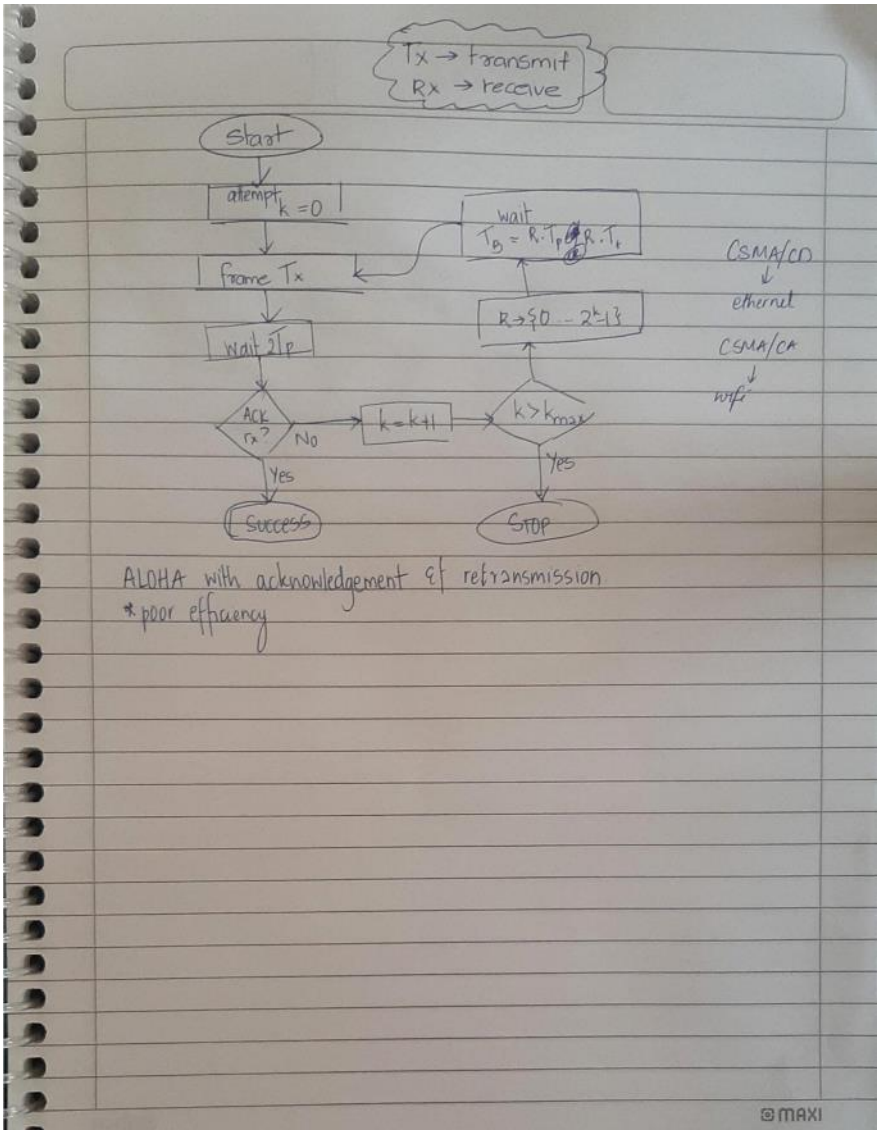
4. Data Link Layer 3

22 February 2021 15:02




represent by asai
16-bit blocks
forouzan → 46 6F | 72 6F | 75 7A | 61 6E
4 6 6 F
+ 7 2 6 F
B 8 D E
7 5 7 A
1 2 E 5 8
1
2 E 5 9
6 1 6 E
8 F C 7
- 8FC7 → (1's complement)
15 15 15 15
8 F C 7
7 0 3 8
data transmitted
checksum
46 6F 72 6F 75 7A 61 6E 70 38
MULTIPLE ACCESS MECHANISMS
*facilitate user to use channel w/out collisions
* common channel
* more than one user accessing same channel
* AVOID COLLISION
FDMA
TDMA
CDMA
(3) Channelization
Out of scope (physical layer)
(1) Random access Protocol
contention
(2) Controlled Access Protocol
→ reservation, polling, token passing
→ ALOHA, CSMA, CSMA/CD, CSMA/CA
pure
slotted
carrier
sends multiple access
detection
avoidance
only for wireless
cannot detect collisions in wireless
no coordination b/w any two stations → random data transmitted according to protocol, no station asks other stations
ALOHA
outdated + very basic
base station
no superior station
assumes data transmitted with 100% success rate
mechanism to detect and avoid collisions
MAXI


S1
S3
S2
S4
station
frame no
f → frame 1.1
time
Sta 1
Sta 2
Sta 3
Sta 4
f1.1
f1.2
collapse
f2.1
collapse
f3.1
collapse
f4.1
S S
S
S
* no-coordination
2/5 frames delivered
3/5 frames lost
[40% success rate]
ALOHA uses
→ acknowledgement
→ retransmission
* If station 1 wants to send data to station 2,
station 1 sends transmits data & waits for acknowledgement
if not received, resends data
Start
attempt=0
Frame Transmitted
wait Tp
ACK received?
NO
YES
STOP, SUCCESS
2
1
3
assume 1 and 3 send data to 2 at the same time. If they keep sending Tp is same for both, they will be in a deadlock
Back off time
MAXI



ALOHA with acknowledgement & retransmission
* poor effiaency