Cairo University
Faculty of Engineering
Computer Engineering Dept.
CMP N405

sheet 2- part 1-*solution*

Framing

1) The following character encoding is used in a data link protocol:
A: 01000111; B: 11100011; FLAG:01111110; ESC: 11100000
Show the bit sequence transmitted (in binary) for the four-character frame:
AB ESC FLAG when each of the following framing methods are used:

a. Character count. *00000101|01000111|11100011|1110000|01111110*

b. Flag bytes with byte stuffing. *01111110|01000111|11100011|1110000|1110000|11100000|01111110|01111110*

c. Starting and ending flag bytes, with bit stuffing.

01111110 0100011111010001111100000011111010 01111110

2) One of your classmates has pointed out that it is wasteful to end each frame with a flag byte and then begin the next one with a second flag byte. One flag byte could do the job as well, and a byte saved is a byte earned. Do you agree?

Disagree, there is noise while the sender is silent , so how to stop sending if the flag at the beginning only, or how to start sending if the flag at the end only?

3) When bit stuffing is used, is it possible for the loss, insertion, or modification of a single bit to cause an error? Give one example.

yes,
1) loss [0111110 01110010 01111110] -> [0111110 01110010 011110]
2) insertion [0111110 01111000 01111110] -> [0111110 011111000 0111110]
3) modification [0111110 01111000 01111110] -> [0111110 01111100 0111110]