

Assignment 4

Due Date: June 24th, 2020

Contact: TA Seunggyu Ji (jiseunggyu@postech.ac.kr)

Instructions

This assignment is written problem. Follow the instructions below:

- Please write your answers in a pdf file or photo.
- -50% for one day late submission, -100% for more than one day without exception.
- Submit your answers on LMS - Assignments.

Written Problems

Problem 1 [3 points]

Suppose the information content of a packet is the bit pattern 1010 0111 0101 1001 and an even parity scheme is being used. What would the value of the field containing the parity bits be for the case of a two-dimensional parity scheme? Your answer should be such that a minimum-length checksum field is used.

Problem 2 [6 points]

For the generator $G (= 1001)$ of the CRC, answer the following questions.

- Why can it detect any single bit error in data D ?
- Can the above G detect any odd number of bit errors? Why?

Problem 3 [6 points]

- Recall that when there are N active nodes, the efficiency of slotted ALOHA is $Np(1-p)^{N-1}$. Find the value of p that maximizes this expression.
- Using the value of p found in (a), find the efficiency of slotted ALOHA by letting N approach infinity. *Hint: $(1-1/N)^N$ approaches $1/e$ as N approaches infinity.*