Networks and Data Communication
FIT1005

Tutorial - Week 8

Objective of this tutorial:
The objective of this tutorial is to strengthen the conceptual understanding of the material covered in the lecture by reflecting on the material in small groups. The tutor will provide feedback to enhance your understanding and diminish misunderstandings, if any.

How to participate in the tutorial:
Form groups of four to five students in each and discuss the answers for the following reflective questions with the group members. After spending about ten minutes for each question, discussing with group members, discuss your solutions with the tutor and other groups. The tutor will provide feedback on your solutions.

ADVANCED: These types of questions will not be on the exam.

Question 1 - Consider the frame transmission shown in Figure 1(a). This diagram shows transmission of fixed sized frames from station **A** to station **B**. It also shows the appropriate acknowledgements transmitted from station **B** to station **A**.

(a) What style of flow control and error control does this diagram shown an example of?

(b) How can the receiving station **B** prevent the transmitting station **A** from sending further frames?

(c) An error has occurred on the fourth frame transmitted (the frame was never received by station **B**). Explain how this error has been detected and corrected.

(d) What will be the number of the next frame transmitted from station **A** to station **B**?

(e) How many frames were successfully received by station **B** during the period of time shown?

Question 2 - Consider the frame transmission shown in Figure 1(b). As with Question 1, this diagram shows transmission of fixed sized frames and acknowledgements between stations **A** and **B**.

(a) What style of flow control and error control does this diagram shown an example of?

(b) How can the receiving station **B** prevent the transmitting station **A** from sending further frames?

(c) An error has occurred on the fourth frame transmitted (the frame was never received by station **B**). Explain how this error has been detected and corrected.

(d) What will be the number of the next frame transmitted from station **A** to station **B**?

(e) How many frames were successfully received by station **B** during the period of time shown?

(f) Why is this technique for flow and error control better than that used in Question 1, and how is this demonstrated by the diagram of Figure 1?
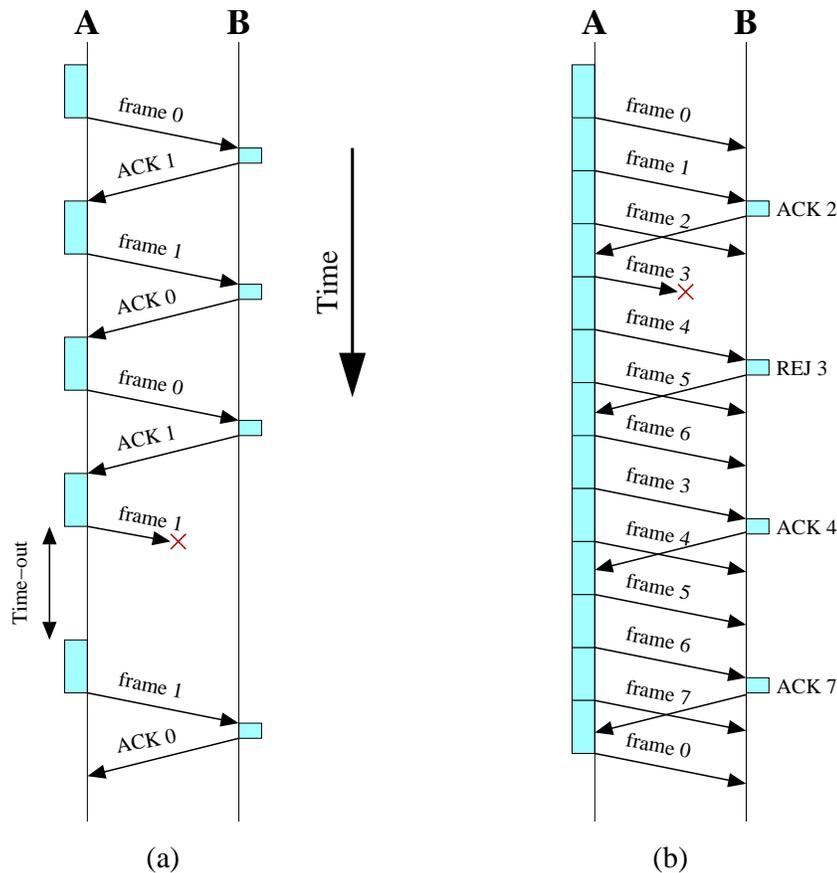
Figure 1: Example transmission of frames for ARQ.

Question 3 - The frame transmission examples shown in Figure 1 demonstrate two types of flow and error control. There is a third method for error control not shown in these examples.

(a) What is the third method for error control?

(b) Explain how this third method for error control would have corrected the missing fourth frame. You may like to draw a diagram similar to those in Figure 1 to help explain.

(c) **ADVANCED**: How many frames would be sent in the same period of time using this form of error control? At what cost?

Question 4 - Error detection adds one or more redundant bits to each frame of data.

(a) Briefly explain how these redundant bits are created and how they are used by the receiver to check for errors.

(b) Using parity as an example of an error detection implementation, show how the bit pattern 01001101 would be sent using odd parity.

(c) What is the problem with parity and briefly describe a technique which fixes this problem.