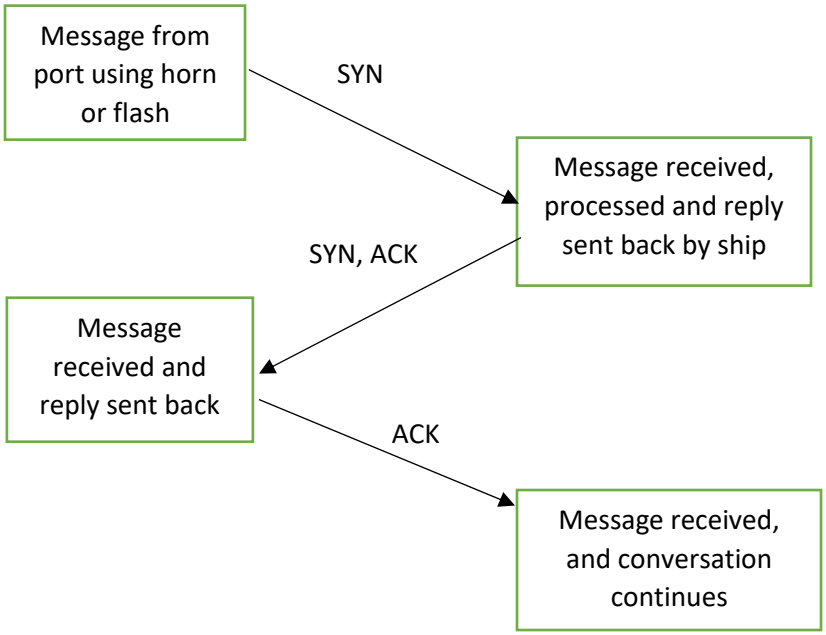
I will be referencing the TCP/IP model for this assignment

Scenario 1 (5 Marks): A ship approaching port needs to send information to the shore about its size and the current speed and direction. The port needs to send the ship a warning about incoming fog and the location of a dangerous, rocky shoreline. The ship to-shore radio is broken, so the ship attempts to transmit the information using Morse Code (flashing a light and blasting a horn) and the port relies on it's fog horn and lighthouse to send it's message to the ship.

What roles (protocols) are in place that ensure that this conversation begins and ends and also has a structure which allows each party to convey (and/or receive) the message. Which layer is reflected in this scenario and what role of that layer is being fulfilled?

Answer: In this scenario it is illustrated that a port needs to send a message to the ship in the see in the absence of ship-to-shore radio, and also need a reply from the ship. Possible logic which will work behind this scenario will be Transport Layer (TCP/IP), because this layer makes a connection through a remote host. In this example ship on the water can be considered as remote host. It is important to make sure that the messages are sent in proper flow and delivery of the messages should be in order, because both ship and port will be sending important messages related to incoming dangers for ship and about the location of the ship. So, the messages sent from both sides should not have any errors in them, this requirement is completed by transport layer. The transmission of data or messages should be reliable and error free and this is the main purpose of transport layer protocol. For relating this example to Data communications, it can be said that both the ship and port are using different networks for sending messages across the water to each other. They are- setting a three-way handshake for setting their communication, port will send a SYN to ship first and then ship will return SYN and ACK, then port will again send ACK, in the form of messages for starting the communication. How the port and the ship will send and receive messages can be depicted diagrammatically as follows:



Scenario 2 (5 Marks): The Prime Minister of Canada is responding to questions at a press conference. Reporters are in seats in front of his podium, raising their hands to get his attention in order to ask their question. The Prime Minister points to reporters one at a time and they ask their question. Once he answers, he points to another reporter so that someone else gets a turn to ask a question.

What roles (protocols) are in place that ensure that this conversation begins and ends and also has a structure which allows each party to convey (and/or receive) the message. Which layer is reflected in this scenario and what role of that layer is being fulfilled?

Answer: Internet layer is reflected in this scenario. Because the main purpose of this layer is to transmit packets of data from any network to a particular destination. In this example, the reporters can be considered as any network from which the data or message will be sent to a particular destination i.e, prime minister of Canada. This conversation will begin from prime minister, where he will independently point the reporters and will answer the question of each reporter turn by turn. In this scenario when prime minister will choose any reporter to answer the question of reporter, this phenomenon will match to the multicast group management system according to internet layer. The reporters in this example can be called as multicast group and the prime minister can be called a central router protocol which will fulfill the requirement of transmission of messages on the network. The conversation will be starting from prime minister with one reporter and then change to the other reporter and will continue until prime minster answers the questions of each individual reporter. The conversation between the prime minister and the reporters can be represented diagrammatically as follows: