EPL606 Computer Networks and the Internet	**Fall 2022**
Assignment 2	
Assigned: 06 Oct. 2022	**Due: 13 Oct. 2022**

Instructions

1. All assignments should be submitted typed neatly using a document processing application of your choice. Please make sure to include your name and student number for proper recording of grades.
2. Assignment solutions can be written either in Greek or English (as long as you are consistent through the same assignment).
3. The assignment is due at the beginning of the lecture at the due date. Late assignments will incur a 20-point penalty. Assignments late by more than one day will not be accepted.

For this set of questions, please refer to the Network Routing slides and parts of the suggested bibliography.

Q1: Why are different inter-AS and intra-AS protocols used in the Internet?

Q2: Define and contrast the following terms: subnet, prefix, and BGP route.

Q3: True or false: When a BGP router receives an advertised path from its neighbor, it must add its own identity to the received path and then send that new path on to all of its neighbors. Explain.

Q4: Describe how loops in paths can be detected in BGP.

Q5: Will a BGP router always choose the loop-free route with the shortest ASpath length? Justify your answer.

Q6: Consider the network shown below. Suppose AS3 and AS2 are running OSPF for their intra-AS routing protocol. Suppose AS1 and AS4 are running RIP for their intra-AS routing protocol. Suppose eBGP and iBGP are used for the inter-AS routing protocol. Initially suppose there is no physical link between AS2 and AS4.
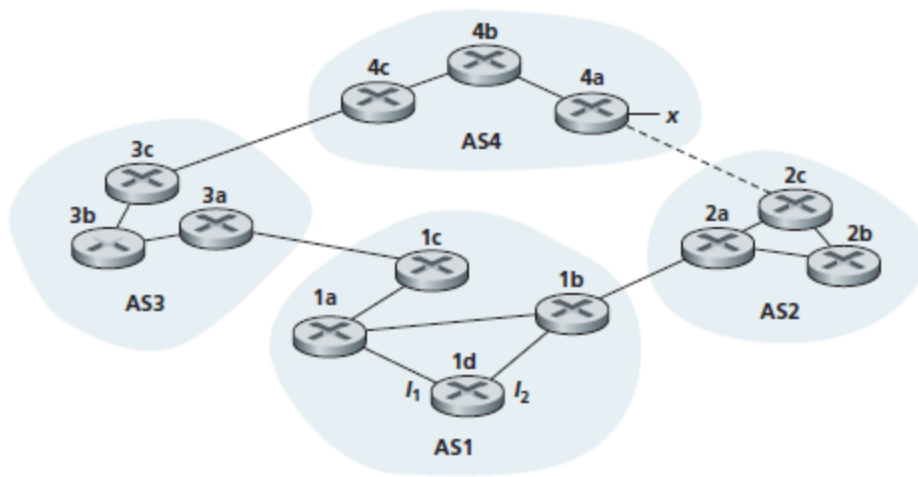
a. Router 3c learns about prefix x from which routing protocol: OSPF, RIP, eBGP, or iBGP?

b. Router 3a learns about x from which routing protocol?

c. Router 1c learns about x from which routing protocol?

d. Router 1d learns about x from which routing protocol?

Q7: Consider the following network. ISP B provides national backbone service to regional ISP A. ISP C provides national backbone service to regional ISP D. Each ISP consists of one AS. B and C peer with each other in two places using BGP. Consider traffic going from A to D. B would prefer to hand that traffic over to C on the West Coast (so that C would have to absorb the cost of carrying the traffic cross-country), while C would prefer to get the traffic via its East Coast peering point with B (so that B would have carried the traffic across the country). What BGP mechanism might C use, so that B would hand over A-to-D traffic at its East Coast peering point? Make sure to provide a reference to where yiu have found your answer.