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| **Skill 10.02 Exercise 1** |
| In the Internet Protocol (IP), computers send messages to each other through a network of routers, with each message split up into packets. How do routers determine where a packet needs to go?   1. Routers look up the packet ID in a database, and find the destination address in the database. 2. Routers look at the IP packet header and use the destination address field. 3. Routers ask DNS servers for the final destination of each packet. 4. Routers make best guesses based on the content of the packet data. 5. Routers wait for subsequent packets that contain the destination address. |

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| **Skill 10.03 Exercise 1** |
| The ARPANET was the precursor to the Internet, the network where Internet technology was first tested out. It got started in 1969 with just four computers connected to each other.  This is a map of ARPANET in 1969:    **How many routes are there between Utah and UCLA?** |
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| **Skill 10.04 Exercise 1** |
| The 1970 ARPANET was not very fault tolerant. With so few connections between nodes, a failure could easily disrupt the ARPANET. **If a computer wanted to send a message from Utah to BBN, which connections definitely needed to stay available?** |

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| **Skill 9.02 Exercise 1** |
| Which of the following IPv4 addresses are illegal? Explain.   1. 1.1.1.1 2. 255.10.10 3. 197.10.22.10 4. 256.10.10.10 |
| How many IP addresses are possible with IPv4? What’s the problem? |

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| **Skill 9.03 Exercise 1** |
| Internet protocol version 6 (IPv6) has been introduced to replace the previous version (IPv4). What is the major benefit of IPv6 over IPv4? |
| Which of the following IPv6 addresses are illegal? Explain.   1. FFDC : C8 : 3E8 : 0000 : 567A : 0000 : 45BB : 2134 2. 1234 : C811 : 113E8 : 0000 : 567A : 0000 : 45BB : 2134 3. AFFB : C8 : 3E8 : 0000 : 567A : 0000 : 45BB 4. ABCD : C8 : 3E8 : 0GAF : 567A : 0000 : 45BB : 2134 |
| How many more possible IPv6 address are there compared to IPv4? |

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| **Skill 9.04 Exercise 1** |
| Navigate to <https://whatismyipaddress.com/> and identify the IP address of the device you are working from. Do you have an IPv4 or an IPv6 address or both? |
| Locate a different device, your phone for example. Make sure you phone is not connected to the same network as your computer. What is the IP address of this device? Are they different or the same? Why? |
| Navigate to <https://ipinfo.info/html/ip_checker.php> and look up the IP address of a website you visit often. Cut-and-paste the IP address into your address bar. Can you navigate it to it? Why or why not? |

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| **Skill 9.05 Exercise 1** |
| Consider the breakdown of the IP address shown below,    **Which of these IP addresses identify computing devices in the UMich Medicine department's network?**   1. 141.213.127.254 2. 141.212.127.73 3. 142.213.127.124 4. 141.213.127.13 |
| If the UMich network reserved 3 bits for the departments, how many departments could they differentiate between? How many computers could be addressed in each department? |