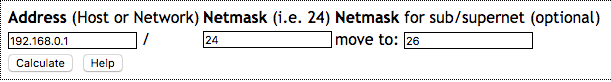
**HW3, Subnetting, 100 points**

**Note: You can use online subnetting tools like** [**http://jodies.de/ipcalc**](http://jodies.de/ipcalc) **to double-check your answers. However, you cannot use any online tool in the exam. The introduced website could be used for equal-size subnetting. For example, if you have a block of IP addresses 192.168.0.1/24 and enter move to: 26, it calculates 4 equal-size subnets of this block.**

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**Question1 (32 points):**

1. Divide 16.35.157.128/25 into sub-blocks of sizes: 64, 16, 16, 16

|  |  |  |
| --- | --- | --- |
| Number | Block size | NetID/mask |
| 1 | 64 | 16.35.157.128 /26 |
| 2 | 16 | 16.35.157.192 /28 |
| 3 | 16 | 16.35.157.208 /28 |
| 4 | 16 | 16.35.157.224 /28 |

1. Divide 16.35.157.128/25 into sub-blocks of sizes: 64, 32, 16, 8, 8

|  |  |  |
| --- | --- | --- |
| Number | Block size | NetID/mask |
| 1 | 64 | 16.35.157.128 /26 |
| 2 | 32 | 16.35.157.192 /27 |
| 3 | 16 | 16.35.157.224 /28 |
| 4 | 8 | 16.35.157.240 /29 |
| 5 | 8 | 16.35.157.248 /29 |

1. Divide 16.35.157.0/26 into sub-blocks of sizes: 32, 16, 16

|  |  |  |
| --- | --- | --- |
| Number | Block size | NetID/mask |
| 1 | 32 | 16.35.157.0 /27 |
| 2 | 16 | 16.35.157.32 /28 |
| 3 | 16 | 16.35.157.48 /28 |

1. Divide 16.35.157.64/26 into sub-blocks of sizes: 32, 8, 8, 8

|  |  |  |
| --- | --- | --- |
| Number | Block size | NetID/mask |
| 1 | 32 | 16.35.157.64 /27 |
| 2 | 8 | 16.35.157.96 /29 |
| 3 | 8 | 16.35.157.104 /29 |
| 4 | 8 | 16.35.157.112 /29 |

1. Divide 16.35.157.64/26 into sub-blocks of sizes: 16, 16, 8, 8

|  |  |  |
| --- | --- | --- |
| Number | Block size | NetID/mask |
| 1 | 16 | 16.35.157.64 /28 |
| 2 | 16 | 16.35.157.80 /28 |
| 3 | 8 | 16.35.157.96 /29 |
| 4 | 8 | 16.35.157.104 /29 |

1. Divide 16.35.157.128/26 into sub-blocks of sizes: 16, 16, 8

|  |  |  |
| --- | --- | --- |
| Number | Block size | NetID/mask |
| 1 | 16 | 16.35.157.128 /28 |
| 2 | 16 | 16.35.157.144 /28 |
| 3 | 8 | 16.35.157.160 /29 |

1. Divide 16.35.157.192/26 into sub-blocks of sizes: 32, 16, 8, 8

|  |  |  |
| --- | --- | --- |
| Number | Block size | NetID/mask |
| 1 | 32 | 16.35.157.192 /27 |
| 2 | 16 | 16.35.157.224 /28 |
| 3 | 8 | 16.35.157.240 /29 |
| 4 | 8 | 16.35.157.248 /29 |

1. Divide 16.35.157.192/26 into sub-blocks of sizes: 16, 16, 8, 8, 8

|  |  |  |
| --- | --- | --- |
| Number | Block size | NetID/mask |
| 1 | 16 | 16.35.157.192 /28 |
| 2 | 16 | 16.35.157.208 /28 |
| 3 | 8 | 16.35.157.224 /29 |
| 4 | 8 | 16.35.157.232 /29 |
| 5 | 8 | 16.35.157.240 /29 |

**Question2 (68 points):**

Divide the network **144.37.0.0/16** among 10 buildings of CSUSM. The table bellow gives the name of each building and the size of network required at each building. Divide the given network range into different-size subnets following the given info. In the second step divide the ACD building network into smaller networks following the given info. **Complete the tables.**

**Step1:** Subnets of CSUSM (25 points)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Number | Building | Block size | NetID/mask | Bcast | Range of valid IP addresses |
| 1 | SCI1 | 214 | 144.37.0,0 /18 | 63.255 | 144.37.0.1-144.37.63.254 |
| 2 | SCI2 | 214 | 144.37.64.0 /18 | 127.255 | 144.37.64.1-144.37.127.254 |
| 3 | SBSB | 213 | 144.37.128.0 /19 | 159.255 | 144.37.128.1-144.37.159.254 |
| 4 | CRA | 212 | 144.37.160.0 /20 | 175.255 | 144.37.160.1-144.37.175.254 |
| 5 | UNV | 212 | 144.37.176.0 /20 | 191.255 | 144.37.176.1-144.37.191.254 |
| 6 | KEL | 212 | 144.37.192.0/20 | 207.255 | 144.37.192.1-144.37.207.254 |
| 7 | MARK | 211 | 144.37.208.0/21 | 215.255 | 144.37.208.1-144.37.215.254 |
| 8 | ACD | 210 | 144.37.216.0/22 | 219.255 | 144.37.216.1-144.37.219.254 |
| 9 | ARTS | 210 | 144.37.220.0/22 | 223.255 | 144.37.220.1-144.37.223.254 |
| 10 | PSB | 25 | 144.37.224.0/27 | 224.31 | 144.37.224.1-144.37.224.30 |

**Step 2:** Subnets of ACD Building (40 points)

ACD Building Network: NetID/mask 144.37.216.0\_/\_22\_\_\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Floor number | Block size | NetID/mask | Bcast | Range of valid IP addresses |
| 1 | 29 | 144.37.216.0/23 | 217.255 | 144.37.216.1-144.37.217.254 |
| 2 | 28 | 144.37.218.0/24 | 218.255 | 144.37.218.1-144.37.218.254 |
| 3 | 28 | 144.37.219.0/24 | 219.255 | 144.37.219.1-144.37.219.254 |

ACD Building, first floor Network: NetID/mask \_\_144.37.216.0\_\_\_\_\_\_\_/\_23\_\_\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Room number | Block size | NetID/mask | Bcast | Range of valid IP addresses |
| 101 | 27 | 144.37.216.0/25 | 216.127 | 144.37.216.1-144.37.216.126 |
| 102 | 26 | 144.37.216.128/26 | 216.191 | 144.37.216.129-144.37.216.190 |
| 103 | 26 | 144.37.216.192/26 | 216.255 | 144.37.216.193-144.37.216.254 |
| 104 | 26 | 144.37.217.0/26 | 217.63 | 144.37.217.1-144.37.217.62 |
| 105 | 25 | 144.37.217.64/27 | 217.95 | 144.37.217.65-144.37.217.94 |
| 106 | 25 | 144.37.217.96/27 | 217.127 | 144.37.217.97-144.37.217.126 |

ACD Building, second floor Network: NetID/mask \_\_\_144.37.218.0\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_\_24\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Room number | Block size | NetID/mask | Bcast | Range of valid IP addresses |
| 201 | 25 | 144.37.218.0/24 | 218.31 | 144.37.218.1-144.37.218.30 |
| 202 | 25 | 144.37.218.32/24 | 218.63 | 144.37.218.33-144.37.218.62 |
| 203 | 25 | 144.37.218.64/24 | 218.95 | 144.37.218.65-144.37.218.94 |
| 204 | 25 | 144.37.218.96/24 | 218.127 | 144.37.218.97-144.37.218.126 |

ACD Building, third floor Network: NetID/mask \_\_\_144.37.219.0\_\_\_\_\_\_\_\_\_\_\_\_\_\_/\_\_24\_\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Room number | Block size | NetID/mask | Bcast | Range of valid IP addresses |
| 301 | 27 | 144.37.219.0/25 | 219.127 | 144.37.219.1-144.37.219.126 |
| 302 | 25 | 144.37.219.128/27 | 219.159 | 144.37.219.129-144.37.219-158 |
| 303 | 25 | 144.37.219.160/27 | 219.191 | 144.37.219.161-144.37.219.190 |

**Step 3:** Collect some information about CSUSM servers (3 points)

Use https://www.ultratools.com/tools/ipWhoisLookup and lookup hostnames given below. What is the IP address for each hostname?

|  |  |
| --- | --- |
| Hostname | IP address |
| cc.csusm.edu | 144.37.5.117 |
| my.csusm.edu | 144.37.5.150 |
| empress.csusm.edu | 144.37.1.24 |

What are the name and IP address of one of CSUSM DNS servers?

Note: You can use <http://www.tcpiputils.com/browse/ip-address>. Enter “csusm.edu” in the search box and look for the DNS servers (NS Records). 2 records is enough.

DNS Name(s): \_\_\_\_\_\_ns1.csu.net\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

DNS IP address(es): \_144.37.5.45\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_