

- 1 "C:\Program Files\Amazon Corretto\jdk1.8.0\_265\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.2.1\lib\idea\_rt.jar=15498:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.2.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\charsets.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\access-bridge-64.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\clldrdata.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\dnsns.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\jaccess.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\jfxrt.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\localedata.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\nashorn.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\sunec.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\sunjce\_provider.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\sunmscapi.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\sunpkcs11.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\ext\zipfs.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\jce.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\jfr.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\jfxswt.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\jsse.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\management-agent.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\resources.jar;C:\Program Files\Amazon Corretto\jdk1.8.0\_265\jre\lib\rt.jar;C:\Users\micah\Desktop\COSC 2P03\Assign\_2\out\production\Assign\_2" Assign\_2.Main
- 2 Tree Created:
- 3 Virus: DNA Virus -> RNA Virus
- 4 RNA Virus: Flaviviridae -> Filoviridae -> Coronaviridae
- 5 Flaviviridae: Flavivirus -> Hepacivirus
- 6 Filoviridae: Cuevavirus -> Dianlovirus -> Ebolavirus -> Marburgvirus
- 7 Coronaviridae: Alphacoronavirus -> Betacoronavirus -> Deltacoronavirus -> Gammacoronavirus -> Alphaletovirus

- 8 Flavivirus: Zika virus -> Yellow fever virus -> West Nile virus
- 9 Hepacivirus: GBV-B -> hepatitis C virus
- 10 Ebolavirus: Ebola virus -> Tai Forest virus -> Bombali virus
- 11 Marburgvirus: Marburg virus
- 12 Alphacoronavirus: Hcov-229E -> Hcov-NL63
- 13 Betacoronavirus: HCoV-OC43 -> HCoV-HKU1
- 14 Betacoronavirus: SARS-CoV
- 15 Betacoronavirus: MERS-CoV
- 16 DNA Virus: Adenoviridae -> Poxviridae
- 17 Adenoviridae: Mastadenovirus
- 18 Poxviridae: Orthopoxvirus
- 19 Mastadenovirus: Canine hepatitis virus
- 20 Orthopoxvirus: Cowpox virus -> Smallpox virus
- 21
- 22 Depth of Tree:
- 23 4
- 24
- 25 Breadth-First Traversal:
- 26 Virus
- 27 DNA Virus
- 28 RNA Virus
- 29 Adenoviridae
- 30 Poxviridae
- 31 Flaviviridae
- 32 Filoviridae
- 33 Coronaviridae
- 34 Mastadenovirus
- 35 Orthopoxvirus
- 36 Flavivirus
- 37 Hepacivirus
- 38 Cuevavirus
- 39 Dianlovirus
- 40 Ebolavirus
- 41 Marburgvirus
- 42 Alphacoronavirus
- 43 Betacoronavirus
- 44 Deltacoronavirus
- 45 Gammacoronavirus
- 46 Alphaletovirus
- 47 Canine hepatitis virus
- 48 Cowpox virus
- 49 Smallpox virus

50 Zika virus  
51 Yellow fever virus  
52 West Nile virus  
53 GBV-B  
54 hepatitis C virus  
55 Ebola virus  
56 Tai Forest virus  
57 Bombali virus  
58 Marburg virus  
59 Hcov-229E  
60 Hcov-NL63  
61 MERS-CoV  
62 SARS-CoV  
63 HCoV-OC43  
64 HCoV-HKU1  
65  
66 Pre-order Traversal:  
67 Virus  
68 DNA Virus  
69 Adenoviridae  
70 Mastadenovirus  
71 Canine hepatitis virus  
72 Poxviridae  
73 Orthopoxvirus  
74 Cowpox virus  
75 Smallpox virus  
76 RNA Virus  
77 Flaviviridae  
78 Flavivirus  
79 Zika virus  
80 Yellow fever virus  
81 West Nile virus  
82 Hepacivirus  
83 GBV-B  
84 hepatitis C virus  
85 Filoviridae  
86 Cuevavirus  
87 Dianlovirus  
88 Ebolavirus  
89 Ebola virus  
90 Tai Forest virus  
91 Bombali virus  
92 Marburgvirus  
93 Marburg virus

- 94 Coronaviridae
- 95 Alphacoronavirus
- 96 Hcov-229E
- 97 Hcov-NL63
- 98 Betacoronavirus
- 99 MERS-CoV
- 100 SARS-CoV
- 101 HCoV-OC43
- 102 HCoV-HKU1
- 103 Deltacoronavirus
- 104 Gammacoronavirus
- 105 Alphaletovirus
- 106
- 107 Post-order Traversal:
- 108 Canine hepatitis virus
- 109 Mastadenovirus
- 110 Adenoviridae
- 111 Cowpox virus
- 112 Smallpox virus
- 113 Orthopoxvirus
- 114 Poxviridae
- 115 DNA Virus
- 116 Zika virus
- 117 Yellow fever virus
- 118 West Nile virus
- 119 Flavivirus
- 120 GBV-B
- 121 hepatitis C virus
- 122 Hepacivirus
- 123 Flaviviridae
- 124 Cuevavirus
- 125 Dianlovirus
- 126 Ebola virus
- 127 Tai Forest virus
- 128 Bombali virus
- 129 Ebolavirus
- 130 Marburg virus
- 131 Marburgvirus
- 132 Filoviridae
- 133 Hcov-229E
- 134 Hcov-NL63
- 135 Alphacoronavirus
- 136 MERS-CoV
- 137 SARS-CoV

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138 HCoV-OC43
139 HCoV-HKU1
140 Betacoronavirus
141 Deltacoronavirus
142 Gammacoronavirus
143 Alphaletovirus
144 Coronaviridae
145 RNA Virus
146 Virus
147
148 Distance between HCoV-OC43 and Hcov-229E:
149 The distance between HCoV-OC43 and Hcov-229E is 2.
    They have common ancestor Coronaviridae.
150
151 Distance between SARS-CoV and Zika virus:
152 The distance between SARS-CoV and Zika virus is 3.
    They have common ancestor RNA Virus.
153
154
155 Process finished with exit code 0
156
```