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 1 "/Volumes/GoogleDrive/My Drive/UMBC Semesters/Spring 2021/Data Struct/
   Projects/Proj2/cmake-build-debug/Proj2"
 2 Welcome to my long awaited project...
 3 **************************************************
 4 Testing DTree insertion...test passed
 5 Resulting DTree:
 6 (1289:10:0((1344:5:0(((1520:1:0)4829:3:0(6400:1:0))7291:4:0))7293:9:0((9224:
   2:0(9289:1:0))9372:3:0)))
 7
 8 Testing DTree insertion same discriminator...test passed
 9 The disc number already exists in tree
10 Resulting DTree:
11 (1289:10:0((1344:5:0(((1520:1:0)4829:3:0(6400:1:0))7291:4:0))7293:9:0((9224:
   2:0(9289:1:0))9372:3:0)))
12
13 Testing DTree insertion only one...test passed
14 (15:1:0)
15
16 Testing DTree removing only one...(15:1:1)
17 test passed
18
19
20 **************************************************
21 Testing DTree retrieve...test passed
22 Account retrieved with disc: 7291 :
23 Account name:
24     Discriminator: 7293
25     Nitro: 0
26     Badge:
```

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27     Status:
28
29 test passed
30 Tree does not have disc: 1
31 (1289:10:0((1344:5:0(((1520:1:0)4829:3:0(6400:1:0))7291:4:0))7293:9:0((9224:
   2:0(9289:1:0))9372:3:0)))
32
33 ****************************************************
34 Testing DTree prrintAccounts...
35 Account name:
36     Discriminator: 1289
37     Nitro: 0
38     Badge:
39     Status:
40 Account name:
41     Discriminator: 1344
42     Nitro: 0
43     Badge:
44     Status:
45 Account name:
46     Discriminator: 1520
47     Nitro: 0
48     Badge:
49     Status:
50 Account name:
51     Discriminator: 4829
52     Nitro: 0
53     Badge:
54     Status:
```

```
55 Account name:
56      Discriminator: 6400
57      Nitro: 0
58      Badge:
59      Status:
60 Account name:
61      Discriminator: 7291
62      Nitro: 0
63      Badge:
64      Status:
65 Account name:
66      Discriminator: 7293
67      Nitro: 0
68      Badge:
69      Status:
70 Account name:
71      Discriminator: 9224
72      Nitro: 0
73      Badge:
74      Status:
75 Account name:
76      Discriminator: 9289
77      Nitro: 0
78      Badge:
79      Status:
80 Account name:
81      Discriminator: 9372
82      Nitro: 0
83      Badge:
```

```
 84     Status:
 85 (1289:10:0((1344:5:0(((1520:1:0)4829:3:0(6400:1:0))7291:4:0))7293:9:0((9224
    :2:0(9289:1:0))9372:3:0)))
 86
 87 ***************************************************
 88 Testing DTree imbalance...test passed
 89 Show balanaced tree
 90 (1289:10:0((1344:5:0(((1520:1:0)4829:3:0(6400:1:0))7291:4:0))7293:9:0((9224
    :2:0(9289:1:0))9372:3:0)))
 91
 92 Testing DTree when balanced...test passed
 93 Show balanaced tree
 94 ((2:1:0)3:4:0(4:2:0(5:1:0)))
 95
 96 ***************************************************
 97 Testing copy constructor...
 98 0x7ffeedd77a60
 99 0x7ffeedd77950
100 0x7f95cd504240
101 0x7f95cd504080
102 ((2:1:0)3:4:0(4:2:0(5:1:0)))
103 ((2:1:0)3:4:0(4:2:0(5:1:0)))
104
105 ***************************************************
106 Testing rebalance...Tree needs to be rebalanced
107 ((2:1:0)3:8:0(4:6:0(5:5:0(6:4:0(7:3:0(8:2:0(9:1:0)))))))
108
109 (((2:1:0)3:3:0(4:1:0))5:8:0((6:1:0)7:4:0(8:2:0(9:1:0))))test passed
110 Visual rep
```

```
111 (((2:1:0)3:3:0(4:1:0))5:8:0((6:1:0)7:4:0(8:2:0(9:1:0))))
112
113 **************************************************
114 Testing remove...
115 (((2:1:0)3:3:0(4:1:0))5:8:1((6:1:0)7:4:1(8:2:0(9:1:0))))
116 (((2:1:0)3:3:0(4:1:0))5:8:2((6:1:0)7:4:1(8:2:0(9:1:0))))
117 (((2:1:0)3:3:0(4:1:0))5:8:2((6:1:0)7:4:1(8:2:0(9:1:0))))
118 ((2:1:0)3:11:1(4:9:1(5:8:1(20:7:0(21:6:0(22:5:0(23:4:0(24:3:0(25:2:0(26:1:0
    ))))))))))
119
120 ***************************************************
121 Testing rebalance with vacant num...
122 Tree needs to be rebalanced
123 (((2:1:0)3:3:0(4:1:0))5:15:2((6:1:0)7:11:1(8:9:0(9:8:0(16:7:0(17:6:0(18:5:0
    (19:4:0(20:3:0(21:2:0(22:1:0)))))))))))
124
125 (((2:2:0(3:1:0))4:6:0((6:1:0)8:3:0(9:1:0))16:13:0((17:2:0(18:1:0))19:6:0((
    20:1:0)21:3:0(22:1:0))))test passed
126 Visual rep
127 (((2:2:0(3:1:0))4:6:0((6:1:0)8:3:0(9:1:0))16:13:0((17:2:0(18:1:0))19:6:0((
    20:1:0)21:3:0(22:1:0))))
128
129 ***************************************************
130 Testing insert with vacant places...
131 ((2:1:0)3:11:1(4:9:1(5:8:1(20:7:0(21:6:0(22:5:0(23:4:0(24:3:0(25:2:0(26:1:0
    ))))))))))
132 ((2:1:0)3:11:0(4:9:0(8:8:0(20:7:0(21:6:0(22:5:0(23:4:0(24:3:0(25:2:0(26:1:0
    ))))))))))
133
```

```
134 **************************************************
135 End of Testing...
136 **************************************************
137 UTree insertion...
138 (((CC:0:1)JJ:1:1(Joud:0:1))KK:3:1((LL:0:1)NN:2:1((OO:0:1)PP:1:1)))
139
140 ***************************************************
141 UTree insertion same username...
142 Visual test: note JJ has 3 DTree nodes...
143 (((CC:0:1)JJ:1:3(Joud:0:1))KK:3:1((LL:0:1)NN:2:1((OO:0:1)PP:1:1)))
144
145 ***************************************************
146 UTree removing...
147 Visual test: note JJ has 2 DTree nodes...
148 (((CC:0:1)JJ:1:2(Joud:0:1))KK:3:1((LL:0:1)NN:2:1((OO:0:1)PP:1:1)))
149
150 UTree removing when all nodes vacant...
151 Visual test: note JJ is gone...
152 (((CC:0:1)Joud:1:1)KK:3:1((LL:0:1)NN:2:1((OO:0:1)PP:1:1)))
153
154 Account name: CC
155     Discriminator: 10
156     Nitro: 0
157     Badge: 4
158     Status: 2
159 Account name: Joud
160     Discriminator: 50
161     Nitro: 0
162     Badge: 4
```

```
163        Status: 2
164 Account name: KK
165        Discriminator: 9
166        Nitro: 0
167        Badge: 4
168        Status: 2
169 Account name: LL
170        Discriminator: 30
171        Nitro: 0
172        Badge: 4
173        Status: 2
174 Account name: NN
175        Discriminator: 30
176        Nitro: 0
177        Badge: 4
178        Status: 2
179 Account name: OO
180        Discriminator: 30
181        Nitro: 0
182        Badge: 4
183        Status: 2
184 Account name: PP
185        Discriminator: 30
186        Nitro: 0
187        Badge: 4
188        Status: 2
189
190
191 Testing UTree insertion...test passed
```

```
192 Resulting UTree:
193
194
195 Process finished with exit code 0
196
```