

```

1 *****
2 * PROGRAMMED BY : Nick Reardon
3 * CLASS          : CS1D
4 * SECTION        : MW - 2:30p
5 * Assignment #5 : Binary Trees
6 *****
7
8             Assignment #5 - Binary Trees
9
10 Implement a binary tree using an array, vector or linked list.
11 (Note: duplicates are allowed in a binary tree)
12
13 Store the following elements using the properties of a binary
14 search tree.
15
16 25, 59, 288, 19, 13, 888, 109, 55, 118, 89, 33, 1001, 18, 44, 88,
17 12, 24, 49, 9,
18
19 Perform the in-order, post-order, pre-order, breadth-first
20 traversals.
21
22 In addition to the traversals, print out the binary tree by
23 level. Show the parent-child relationship for all the nodes of
24 the tree.
25
26
27 Due February 19th
28
29
30 *****
31
32 ---25
33
34
35     .---59
36 ---25
37
38
39         .---288
40     .---59
41 ---25
42
43
44         .---288
45     .---59
46 ---25
47     `---19
48
49
50         .---288
51     .---59
52 ---25
53     `---19
54         `---13
55
56
57         .---888
58     .---288

```

```

59      .---59
60 ---25
61      \---19
62         \---13
63
64
65             .---888
66             .---288
67             |      \---109
68             .---59
69 ---25
70         \---19
71             \---13
72
73
74             .---888
75             .---288
76             |      \---109
77             .---59
78             |      \---55
79 ---25
80         \---19
81             \---13
82
83
84             .---888
85             .---288
86             |      |      .---118
87             |      \---109
88             .---59
89             |      \---55
90 ---25
91         \---19
92             \---13
93
94
95             .---888
96             .---288
97             |      |      .---118
98             |      \---109
99             |      \---89
100            .---59
101            |      \---55
102 ---25
103         \---19
104             \---13
105
106
107             .---888
108             .---288
109             |      |      .---118
110             |      \---109
111             |      \---89
112            .---59
113            |      \---55
114            |      \---33
115 ---25
116         \---19

```

```

117 |         \---13
118 |
119 |
120 |             .---1001
121 |             .---888
122 |             .---288
123 |             |   |   .---118
124 |             |   |   \---109
125 |             |   |   \---89
126 |             .---59
127 |             |   \---55
128 |             |   \---33
129 |---25
130 |     \---19
131 |     \---13
132 |
133 |
134 |             .---1001
135 |             .---888
136 |             .---288
137 |             |   |   .---118
138 |             |   |   \---109
139 |             |   |   \---89
140 |             .---59
141 |             |   \---55
142 |             |   \---33
143 |---25
144 |     \---19
145 |         |   .---18
146 |         |   \---13
147 |
148 |
149 |             .---1001
150 |             .---888
151 |             .---288
152 |             |   |   .---118
153 |             |   |   \---109
154 |             |   |   \---89
155 |             .---59
156 |             |   \---55
157 |             |   |   .---44
158 |             |   |   \---33
159 |---25
160 |     \---19
161 |         |   .---18
162 |         |   \---13
163 |
164 |
165 |             .---1001
166 |             .---888
167 |             .---288
168 |             |   |   .---118
169 |             |   |   \---109
170 |             |   |   \---89
171 |             |   |   \---88
172 |             .---59
173 |             |   \---55
174 |             |   |   .---44

```

```
175 |           \---33
176 ---25
177 |   \---19
178 |       .---18
179 |       \---13
180
181
182 |           .---1001
183 |           .---888
184 |       .---288
185 |       |       |       .---118
186 |       |       |       \---109
187 |       |       |       \---89
188 |       |       |       \---88
189 |       |       |   .---59
190 |       |       |       \---55
191 |       |       |       |       .---44
192 |       |       |       |       \---33
193 ---25
194 |   \---19
195 |       .---18
196 |       \---13
197 |       \---12
198
199
200 |           .---1001
201 |           .---888
202 |       .---288
203 |       |       |       .---118
204 |       |       |       \---109
205 |       |       |       \---89
206 |       |       |       \---88
207 |       |       |   .---59
208 |       |       |       \---55
209 |       |       |       |       .---44
210 |       |       |       |       \---33
211 ---25
212 |       .---24
213 |   \---19
214 |       .---18
215 |       \---13
216 |       \---12
217
218
219 |           .---1001
220 |           .---888
221 |       .---288
222 |       |       |       .---118
223 |       |       |       \---109
224 |       |       |       \---89
225 |       |       |       \---88
226 |       |       |   .---59
227 |       |       |       \---55
228 |       |       |       |       .---49
229 |       |       |       |       .---44
230 |       |       |       |       \---33
231 ---25
232 |       .---24
```

```

233 | `---19
234 |   | .---18
235 |   | `---13
236 |   |   `---12
237 |
238 |
239 |           .---1001
240 |           .---888
241 |       .---288
242 |       |   | .---118
243 |       |   | `---109
244 |       |   | `---89
245 |       |   | `---88
246 |   .---59
247 |   |   `---55
248 |   |   | .---49
249 |   |   | .---44
250 |   |   | `---33
251 |---25
252 |   | .---24
253 |   | `---19
254 |   |   | .---18
255 |   |   | `---13
256 |   |   |   `---12
257 |   |   |       `---9
258 |
259 |
260 |           .---1001
261 |           .---888
262 |       .---288
263 |       |   | .---118
264 |       |   | `---109
265 |       |   | `---89
266 |       |   | `---88
267 |   .---59
268 |   |   `---55
269 |   |   | .---49
270 |   |   | .---44
271 |   |   | `---33
272 |---25
273 |   | .---24
274 |   | `---19
275 |   |   | .---18
276 |   |   | `---13
277 |   |   |   `---12
278 |   |   |       `---9
279 |
280 |
281 | Level By Level:
282 | 25
283 | 19  59
284 | 13  24  55  288
285 | 12  18  33  109  888
286 | 9  44  89  118  1001
287 | 49  88
288 |
289 | In Order Traversal:
290 | 9  12  13  18  19  24  25  33  44  49  55  59  88  89  109  118  288  888  1001

```

```
291 |
292 | Post Order Traversal:
293 | 9 12 18 13 24 19 49 44 33 55 88 89 118 109 1001 888 288 59 25
294 |
295 | Pre Order Traversal:
296 | 25 19 13 12 9 18 24 59 55 33 44 49 288 109 89 88 118 888 1001
297 |
298 | Breadth First Traversal:
299 | 25 19 59 13 24 55 288 12 18 33 109 888 9 44 89 118 1001 49 88
300 |
301 | sh: pause: command not found
302 | Process exited with status 0
303 | logout
304 | Saving session...
305 | ...copying shared history...
306 | ...saving history...truncating history files...
307 | ...completed.
308 |
309 | [Process completed]
310 |
311 |
```