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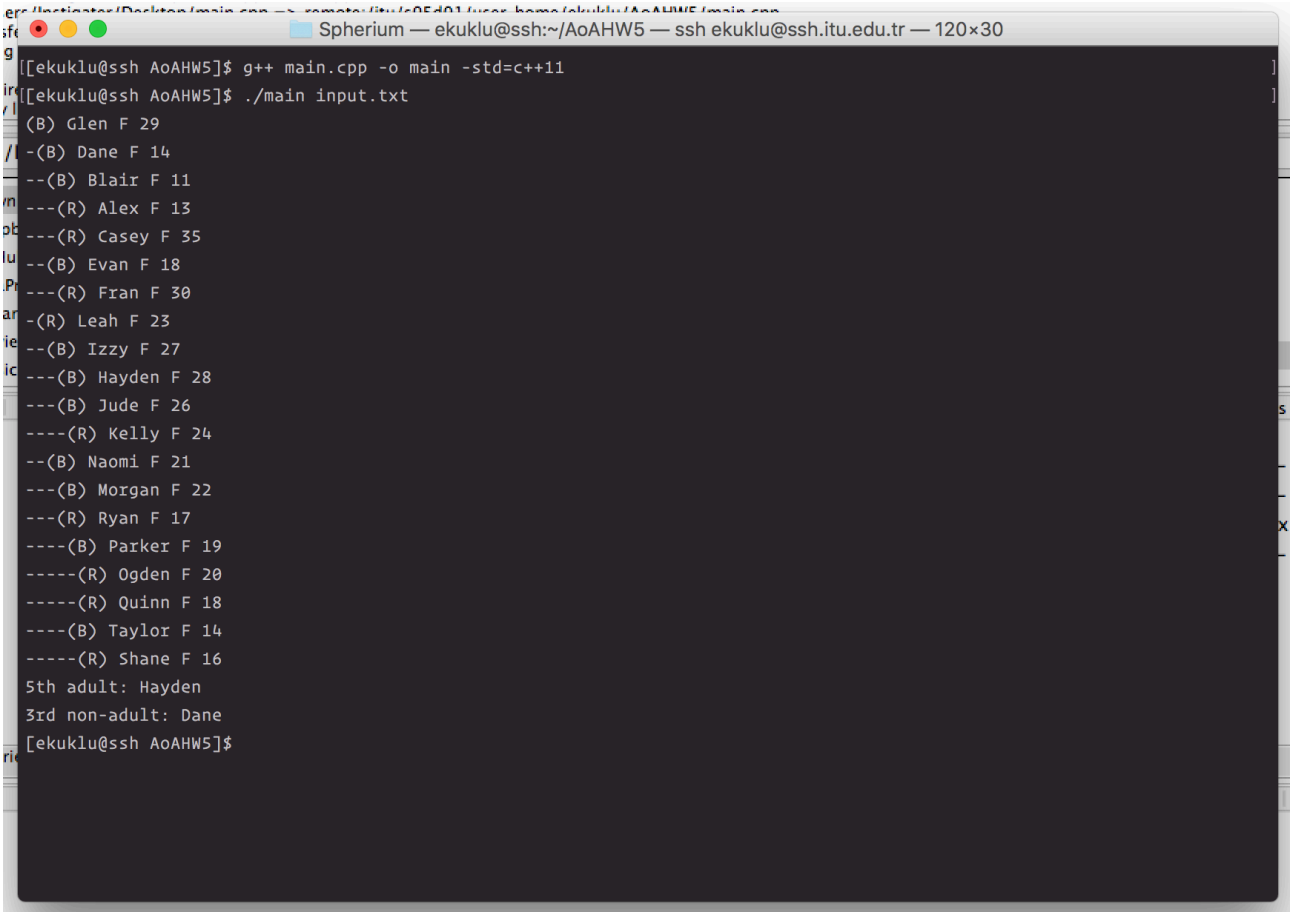
ANALYSIS OF ALGORITHMS

ASSIGNMENT V

SCREENSHOT OF THE PROGRAM



ANSWERS OF QUESTIONS

Briefly explain what you would do to correctly update the name of a person as a node in the Red–Black Tree.

Firstly, we would find the node with given name. Since red-black tree is also a binary search tree, we could find the proper node by using recursion technique. Then, we would delete that node and fix the table with following pseudocode:

```
PROCEDURE UPDATE-NODE(x, key):

P <- DELETE-NODE(x, key)

do while P is not root[x] and P is black
       if left[parent[P]] = P then
              J <- right[parent[P]]
              if color[J] is RED then
                     RECOLOR(J)
                     LEFT-ROTATE(parent[P])
              if color[right[J]] is BLACK and color[left[J]] is BLACK then
                     RECOLOR(J)
                     parent[P] <- P
              else if color[right[J]] is BLACK then
                     RECOLOR(J)
                     RIGHT-ROTATE(parent[P])
       else
              <<<same procedure for else but left and right swapped>>>

INSERT-NODE(x, key)
```

Briefly explain what you would do to correctly increment(by 1) the ages of all people in the Red–Black Tree.

Just like our print function, one might increment age field of all nodes with recursive approach:

```
PROCEDURE INCREMENT-AGES(x):


age[x] <- age[x] + 1

if left[x] exists then
       INCREMENT-AGES(left[x])

if right[x] exists then
       INCREMENT-AGES(right[x])
```