**Programming Assignment #5**

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**Design:**

In this program, a BinaryTree class was implemented to store Quarterback objects sorted by their Game number. The program was designed to print out all Quarterback objects that were in the range of Game [a,b] and Rating [c,d]. The inputs a, b, c, and d were supplied by the user.

**Implementation:**

For the implementation process, I started by making the program read all of the stats of the Quarterbacks from QB.txt. After the program printed out the correct stats, I created the Quarterback class and saved the stats into Quarterback objects instead and called the Quarterback::print() function. Once that was successful, I started changing the BinaryTree class from the source code on Moodle to save Quarterback objects instead of integers. This involved writing a compareByGame() function in the Quarterback class. The Quarterback objects were ordered by Game in the tree. Afterwards, the BinaryTree::QueryField() function was written to only print out the Quarterbacks that fit the user-specified ranges. The program took about 2 hours to write.

**Testing:**

The program was tested after each small step outlined in the Program Description. Normal inputs included ranges that existed, such as [3,68] and [50,70]. Abnormal inputs were ranges like [50,30] and [30,9]. Everything worked as expected.

**Summary:**

Overall, the project was a success. The program accurately prints out each Quarterback object in the range specified. The program took 2 hours to complete.

**Test Case 1:**

Program will print QBs with Game in range [a,b] and Rating in range [c,d].

a: 5

b: 12

c: 50

d: 80

Thank you. Printing...

Player: Jason Campbell

Team: CHI

Game: 6

Rating: 72.8

Player: Nick Foles

Team: PHI

Game: 7

Rating: 79.1

Player: John Skelton

Team: ARI

Game: 7

Rating: 55.4

Player: Tyrod Taylor

Team: BAL

Game: 7

Rating: 62.3

Player: Matt Cassel

Team: KC

Game: 9

Rating: 66.7

Player: Blaine Gabbert

Team: JAC

Game: 10

Rating: 77.4

Player: Chad Henne

Team: JAC

Game: 10

Rating: 72.2

Player: Brady Quinn

Team: KC

Game: 10

Rating: 60.1

Player: Michael Vick

Team: PHI

Game: 10

Rating: 78.1

Player: Jake Locker

Team: TEN

Game: 11

Rating: 74

RUN FINISHED; exit value 0; real time: 7s; user: 0ms; system: 0ms

**Test Case 2:**

Program will print QBs with Game in range [a,b] and Rating in range [c,d].

a: 7

b: 3

c: 60

d: 70

Thank you. Printing...

No values in this range.

RUN FINISHED; exit value 0; real time: 6s; user: 0ms; system: 0ms

**Test Case 3:**

Program will print QBs with Game in range [a,b] and Rating in range [c,d].

a: 4

b: 4

c: 30

d: 90

Thank you. Printing...

RUN FINISHED; exit value 0; real time: 8s; user: 0ms; system: 0ms