DEPARTMENT OF COMPUTER SYSTEM ENGINEERING

UNIVERSITY OF ENGINEERING & TECHNOLOGY PESHAWAR

4th Semester SPRING 2023

Assignment # 3
Max Marks: 10 Marks
Due Date: 22 June 2023 before 11am
Plagiarism Policy:

Plagiarism is strictly not allowed. Any case of plagiarism will get zero marks.

Q1

Convert the code below so that it can handle Right Imbalance – RR and RL imbalance.

```
IF d = +1
     THEN (* left imbalance *)
          IF ExamineBF(B) = +1
               THEN (* LL Rotation *)
               (* replace left subtree of A *)
               (* with right subtree of B *)
               temp := B; Child(1, temp, T);
               ReplaceChild(0, A, T, temp);
               (* replace right subtree of B with A *)
               ReplaceChild(1, B, T, A);
               ReplaceBF(0, A, T);
               ReplaceBF(0, B, T);
          ELSE (* LR Rotation *)
               C := B; Child(1, C, T);
               C_L := C; Child(0, C_L, T);
               C_R := C; Child(1, C_R, T);
               ReplaceChild(1, B, T, C_L);
               ReplaceChild(0, A, T, C_R);
               ReplaceChild(0, C, T, B);
               ReplaceChild(1, C, T, A);
          IF ExamineBF(C) = +1 (* RL(b) *)
          THEN
               ReplaceBF(-1, A, T);
               ReplaceBF(0, B, T);
          ELSE
          IF ExamineBF(C) = -1 (* RL(c) *)
               THEN
```

```
                    ReplaceBF(+1, B, T);
                    ReplaceBF(0, A, T);
               ELSE (* LR(a) *)
                    ReplaceBF(0, A, T);
                    ReplaceBF(0, B, T);
          ENDIF
     ENDIF
     (* B is new root *)
          ReplaceBF(0, C, T);
          B := C
     ENDIF (* LR rotation *)
     ELSE (* right imbalance *)
     (* this is symmetric to left imbalance *)
     (* and is left as an exercise! *)
ENDIF (* d = +1 *)
```

Note: All your answers to the questions/ C++ code posed in the assignment should be organized as a handwritten document that you would submit.