

OS REFRESHER MODULE 3

Q1. Arguments (command line) enter by the user are \$1(day in number) \$2(month) and \$3(year).

The date is divided into three cases.

First case checks whether the year is a leap year or not. On the basis of that if the month is February, then only the condition is further checked. For leap year the day (in number) should be less than or equal to 29 and for non-leap year it should be less than or equal to 28.

Second case checks all the months having 31 days. Error is given if the day is more than 31.

Third case checks all the months having 30 days. Error is displayed if day is greater than 30.

Q2. User is shown options to select with a menu-based system. In every function a loop is created from the 2nd input argument taken till the end of the array.

If elif else conditions are made to check whether the first argument given by the user on the command line is one of the operations(subtraction-sub,addition-add,multiplication-mul,division-div,exponent-exp).

Q3.a Preorder traversal(root then left then right) is used to display the changes after doing insertion or deletion. During insertion if the number to be inserted is inserted on the left of the parent node only if it is lesser in value as compared to the parent node and to the right if it is greater than the parent node. A node is inserted in the right should be greater than the parent node but not greater than the ancestor nodes.

b. AVL is a height balancing BST. The height difference between two nodes having same parent should not be more than one. The height difference can be -1,0 and 1.

Whenever a node is deleted or inserted in between so then the remaining nodes which are connected undergo rotation which can be left or right.

4. Bubble sort and selection sort are both sorting algorithms with time complexity $O(n^2)$. In bubble sort adjacent elements are compared and swapped depending on the value(greater or lesser, whichever is considered).

In selection sort the minimum element is taken and compared with every element. If any element with lower value/greater is found then that becomes the lower or greater number to be compared.