

Major Assignment

Data structure and Algorithms

NAME: Zahoor Khan

I.D: 13835

Test #1

(a) Insertion Sort:

```
#include <bits/stdc++.h>
using namespace std;
void insertionSort (int arr [], int n)
{
    int i, key, j;
    for (i=1; i<n; i++)
        key = arr [i];
        j = i-1;
    while (j>=0 && arr [j]>key)
    {
        arr [j+1] = arr [j];
        j = j-1;
    }
    arr [j+1] = key;
}
void print Array (int arr [], int n)
{
    int i;
    for (i=0; i<n; i++)
        cout << arr [i] << " ";
    cout << endl;
}
```

## Driver code

```

int main ()
{
    int arr[] = {12, 30, 14, 9, 10, 12, 7, 9, 0}
    int n = sizeof(arr) / sizeof(arr[0]);
    Insertion Sort (arr, n);
    Print Array (arr, n);
    return 0;
}

```

## (B) Bubble Sort.

```

#include <bits/stdc++.h>
using namespace std;
void swap (int *p, int *q)
{
    int temp = *q;
    *q = *p;
    *p = temp;
}
void bubble sort (int arr[], int n)
{
    for (int i = 0; i < n - 1; i++)
        for (int j = 0; j < n - i - 1; j++)
            if (arr[j] > arr[j+1])
                swap (&arr[j], &arr[j+1]);
}
void print Array (int arr[], int size)
{
    for (int i = 0; i < size; i++)
        cout << arr[i] << " ";
    cout << endl;
}
int main ()

```

```

int main ()
{
    int arr[] = {12, 30, 14, 9, 10, 12, 7, 9, 0}
    int n = size of (arr) / size of (arr[0]);
    bubble sort (arr, n);
    cout << "Sorted array: | n |
    Print Array (arr, n);
    return 0;
}

```

## (C) Selection Sort

```

#include <bits/stdc++.h>
using namespace std;
void swap (int *x, int *y)
{

```

```

    int temp = *x;
    *x = *y;
    *y = temp;
}

```

```

void selection sort (int arr[], int n)

```

```

    int i, j, min_idx;
    for (i = 0; i < n - 1; i++)
    {

```

```

        min_idx = i;

```

```

        for (j = i + 1; j < n; j++)

```

```

            if (arr[j] < arr[min_idx])

```

```

                min_idx = j;

```

```

            swap (arr[min_idx], arr[i]);

```

```

    void print Array (int arr[], int size)

```

```

{

```

```

    int i;

```

```

    for (i = 0; i < size; i++)

```

```

        cout << arr[i] << " ";

```

```

    cout << endl;
}

```

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```
void print Array (int arr[], int size)
{
    int i;
    for (i=0; i<size; i++)
        cout << arr[i] << " ";
    cout << endl;
}
```

```
int main ()
{
    int arr[] = {12, 30, 14, 9, 10, 12, 7, 4, 0};
    int n = size of (arr) / size of (arr[0]);
    Selection Sort (arr, n);
    cout << "Sorted array = " << n << endl;
    print Array (arr, n);
    return 0;
}
```

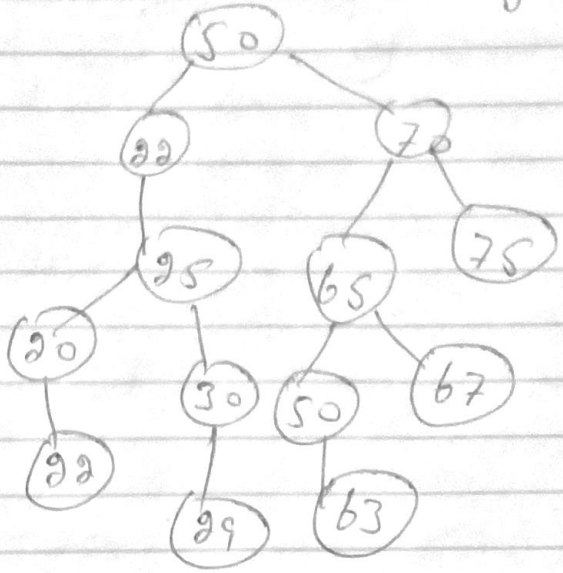
```

int main ()
{
  int arr[] = {12, 30, 14, 9, 10, 12, 7, 9, 0};
  int n = size of (arr) / size of (arr[0]);
  Selection Sort (arr, n);
  cout << "Sorted arr: /n";
  print Array (arr, n);
  return 0;
}

```

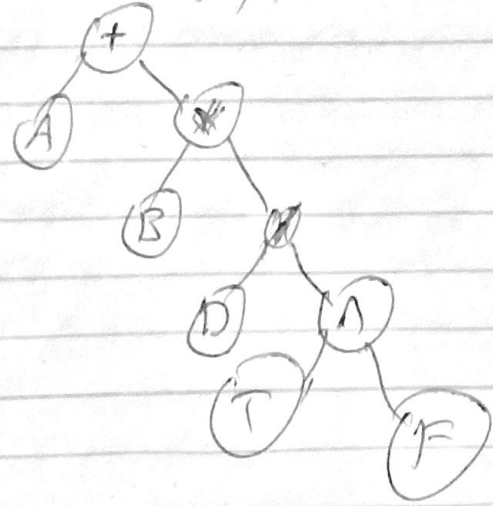
Tasks

Binary tree -



Task #3

A + B \* D / T + F



(2)  $(m \times N)^1 3 - A \times (7)$

