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Distributed System Lab

LAB – 2

Aim: Simulate the functioning of Lamport's logical Clock

Program:

```
#include <bits/stdc++.h>
using namespace std;
int max1(int a, int b)
{
    if (a > b)
        return a;
    else
        return b;
}
void display(int e1, int e2, int p1[5], int p2[3])
{
    int i;
    cout << "\nThe time stamps of events in P1:\n";
    for (i = 0; i < e1; i++) {
        cout << p1[i] << " ";
    }
    cout << "\nThe time stamps of events in P2:\n";
    for (i = 0; i < e2; i++)
        cout << p2[i] << " ";
}
void lamportLogicalClock(int e1, int e2, int m[5][3])
{
    int i, j, k, p1[e1], p2[e2];
    for (i = 0; i < e1; i++)
        p1[i] = i + 1;
    for (i = 0; i < e2; i++)
        p2[i] = i + 1;
    for (i = 0; i < e2; i++)
        cout << "\te2" << i + 1;
    for (i = 0; i < e1; i++) {
        cout << "\ne1" << i + 1 << "\t";
        for (j = 0; j < e2; j++)
```

```

        cout << m[i][j] << "\t";
    }
    for (i = 0; i < e1; i++) {
        for (j = 0; j < e2; j++) {
            if (m[i][j] == 1) {
                p2[j] = max1(p2[j], p1[i] + 1);
                for (k = j + 1; k < e2; k++)
                    p2[k] = p2[k - 1] + 1;
            }
            if (m[i][j] == -1) {
                p1[i] = max1(p1[i], p2[j] + 1);
                for (k = i + 1; k < e1; k++)
                    p1[k] = p1[k - 1] + 1;
            }
        }
    }
    display(e1, e2, p1, p2);
}

```

```

int main()
{
    int e1 = 5, e2 = 3, m[5][3];
    m[0][0] = 0;
    m[0][1] = 0;
    m[0][2] = 0;
    m[1][0] = 0;
    m[1][1] = 0;
    m[1][2] = 1;
    m[2][0] = 0;
    m[2][1] = 0;
    m[2][2] = 0;
    m[3][0] = 0;
    m[3][1] = 0;
    m[3][2] = 0;
    m[4][0] = 0;
    m[4][1] = -1;
    m[4][2] = 0;
    lamportLogicalClock(e1, e2, m);
    return 0;
}

```

Output:

```
      e21    e22    e23
e11    0      0      0
e12    0      0      1
e13    0      0      0
e14    0      0      0
e15    0     -1      0
The time stamps of events in P1:
1 2 3 4 5
The time stamps of events in P2:
1 2 3
-----
```