BLG223E
Homework-1

Assistant Professor Dr. Yusuf Huseyin Sahin
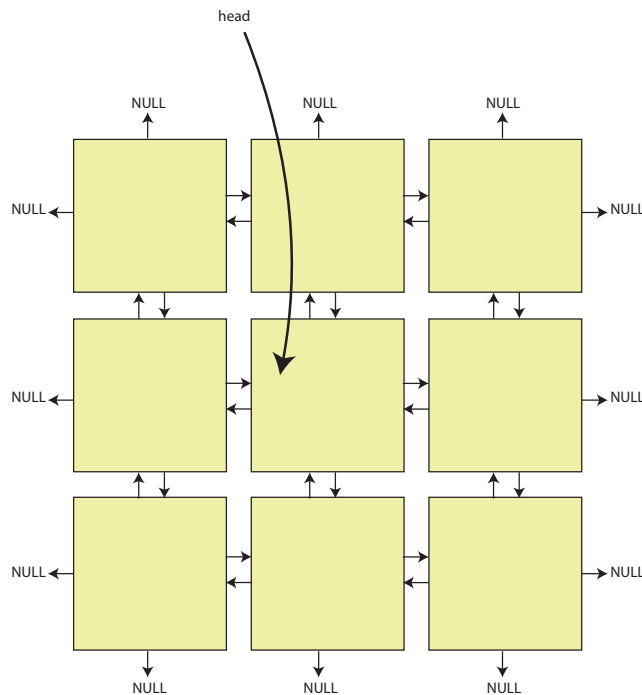*sahinyu@itu.edu.tr*

Figure 1: The Cell Grid data structure

In this homework, you will create a new data structure which represents a two-dimensional grid where each element (called a Node) is linked to its four immediate neighbors: up, down, left, and right. This creates a four-directionally connected network of nodes that can be traversed horizontally and vertically. The main distinction of this design is that instead of referencing a corner node, the structure maintains a pointer called "head", which always points to the center node of the grid.

Each node contains a data field (e.g., an integer value) and four directional pointers:

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```
typedef struct Node {
    int value;
    struct Node *up, *down, *left, *right;
} Node;
```

Using the Node data structure, the CellGrid could be defined as:

```
typedef struct {
    Node *head;        // Always points to the center node
    size_t rows, cols;
} CellGrid;
```

- Implement the **Grid *gridcreate(int rows, int cols, int initvalue)** function which creates a CellGrid for given dimensions and fills every cell with the given initial value.

- Implement the **void gridupdate(CellGrid* grid, int col, int row, int newvalue)** function which uptades the value for given position. Consider the head Node is at position (0,0).

- Implement the **void deleterow(CellGrid *g, int rowindex)** function which deletes a row from the CellGrid according to given ID.

- Implement the **int sumgrid(CellGrid *g)** function which returns the sum of elements for the given CellGrid.