**Question**

A class named "ColumnSort" with the following details:

* Data members:
  + "arr": a 2D array to store the elements.
* Member methods:
  + "ColumnSort()": a default constructor to initialize the 2D array.
  + "acceptArray()": a method to accept the elements into the 2D array.
  + "sortColumns()": a method to sort the elements down each column of the 2D array in ascending order.
  + "displayArray()": a method to display the original and sorted 2D arrays.

Define main() function to create an object and call the functions accordingly to enable the task.

**Algorithm** :

1. Start

2. Define a class `ColumnSort` with the following instance variables:

- `arr` of type `int[][]` to store the elements of the 2D array.

3. Define a default constructor for the class `ColumnSort`:

- Initialize `arr` with a new 2D array of size 3x3.

4. Define a method `acceptArray()` to accept the elements into the 2D array:

- Create a `Scanner` object to read input from the user.

- Print "Enter the elements of the 2D array:".

- Loop through each row from `0` to `2`:

- Loop through each column from `0` to `2`:

- Read an integer from the user and store it in `arr[i][j]`.

5. Define a method `sortColumns()` to sort the elements down each column of the 2D array in ascending order:

- Loop through each column from `0` to `2`:

- Create a temporary array `column` of size `3` to store the column elements.

- Loop through each row from `0` to `2`:

- Copy the element from `arr[i][j]` to `column[i]`.

- Sort the `column` array using `Arrays.sort(column)`.

- Loop through each row from `0` to `2`:

- Copy the element from `column[i]` back to `arr[i][j]`.

6. Define a method `displayArray()` to display the original and sorted 2D arrays:

- Print "Original Array:".

- Call the `printArray(arr)` method to print the original array.

- Call the `sortColumns()` method to sort the columns.

- Print "Sorted Array:".

- Call the `printArray(arr)` method to print the sorted array.

7. Define a helper method `printArray(int[][] array)` to print the 2D array:

- Loop through each row from `0` to `2`:

- Loop through each column from `0` to `2`:

- Print the element `array[i][j]` followed by a space.

- Print a newline character.

8. Define the `main` method to test the `ColumnSort` class:

- Create an object of the class `ColumnSort`.

- Call the `acceptArray()` method to accept the elements into the 2D array.

- Call the `displayArray()` method to display the original and sorted arrays.

9. End

**Variable Description Table**

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Type** | **Description** |
| arr | int[][] | A 2D array to store the elements of the matrix. |
| column | int[] | A temporary array to store the elements of a single column during sorting. |
| i | int | A loop control variable for iterating through rows. |
| j | int | A loop control variable for iterating through columns. |