Practice Array 2D-2 (10-08-2021)

Q000. Create following program:

```
int main(){
      #define ROWS 6
      #define COLUMNS 8
      int x[ROWS][COLUMNS], i, j, temp   ;
      srand(time(0));
      for (i=0;i<ROWS;i++){
            for (j=0;j<COLUMNS;j++){
                  x[i][j] = rand()%100;
                  printf("%3d ", x[i][j]);
            }
            printf("\n");
      }
      printf("----------------------\n");
      printf ("Enter Row Number:");
      scanf ("%d", &i);
      printf ("Enter Column Number:");
      scanf ("%d", &j);
      printf("Your required element is:%d\n", x[i-1][j-1]);
      return 0;
}
```

Q5. Extend above program, if row or column is invalid (out of range), give appropriate message, otherwise print value according to input?

Q6. Extend above program, take input inside loop until user enters a valid number for row and column value. When user will enter a valid number, terminate the loop and print appropriate value. See output for better understanding:

```
 86  32  82   2  62  57  17  12
  3  55  14  46  32  47  30   0
 51  63  55  92  51  60  63  39
 16  35  27   9  41  32  20  78
 92  19  36  62  74  94   3  46
 44  99  42  58  14  10  19  93
----------------------
Enter Row Number:0
Enter Column Number:5
You have entered wrong values, please give input in range

Enter Row Number:3
Enter Column Number:9
You have entered wrong values, please give input in range

Enter Row Number:2
Enter Column Number:4
Your required value is:46
```

Move to next page for more questions

Q7. Modify **Q000** and print indexes of zero values in the array:

```
  8   2  18  16  11   3  17   2
 16  15  13  13  15  17   6  16
  6  10   1   0  16  15  18  14
  8  19   4  10  11  12  10   8
  9   2  19  18  13   6   0  18
  2  11   4   5  12  18   1   0
----------------------
x[2][3] is 0
x[4][6] is 0
x[5][7] is 0
```

Q8. Modify **Q000**, print array two times, second time print * in place of zero values:

```
  5  18   3   0  16   9  18   3
  7   1  13   8   4  11  17  11
 17   2   0   8   6   2   9  19
  2  12  10   5   3  14  14  13
 16  16   0  10  10   7   8   5
  7  17   4  16   3  10   9   4
----------------------
  5  18   3   *  16   9  18   3
  7   1  13   8   4  11  17  11
 17   2   *   8   6   2   9  19
  2  12  10   5   3  14  14  13
 16  16   *  10  10   7   8   5
  7  17   4  16   3  10   9   4
```

Q0000. Create and run following program:

```
int main(){
      #define ROWS 3
      #define COLUMNS 5
      int a[ROWS*COLUMNS]={7,38,71,7,82,14,27,66,30,3,44,33,40,85,62};
      int x[ROWS][COLUMNS], i, j, k;
      for (i=0;i<ROWS*COLUMNS;i++)
            printf("%3d ", a[i]);
      printf("\n");
      for (i=0,k=0;i<ROWS;i++)
            for (j=0;j<COLUMNS;j++)
                  x[i][j] = a[k++];
      for (i=0;i<ROWS;i++){
            for (j=0;j<COLUMNS;j++)
                  printf("%3d ", x[i][j]);
            printf("\n");
      }
      return 0;
}
```

Note: This program converts a one-dimension array into two dimensional array with same number of values.

Q9. Modify **Q0000**, initialize, two dimensional array with same value, convert it into one dimensional array and print? (Remember mapping function discussed in class)

Q10. Create a two-dimensional array to store marks of students in first two semesters with five subjects in each semester. Initialize the marks out of 100 randomly. Calculate & print average of each semester and overall average.