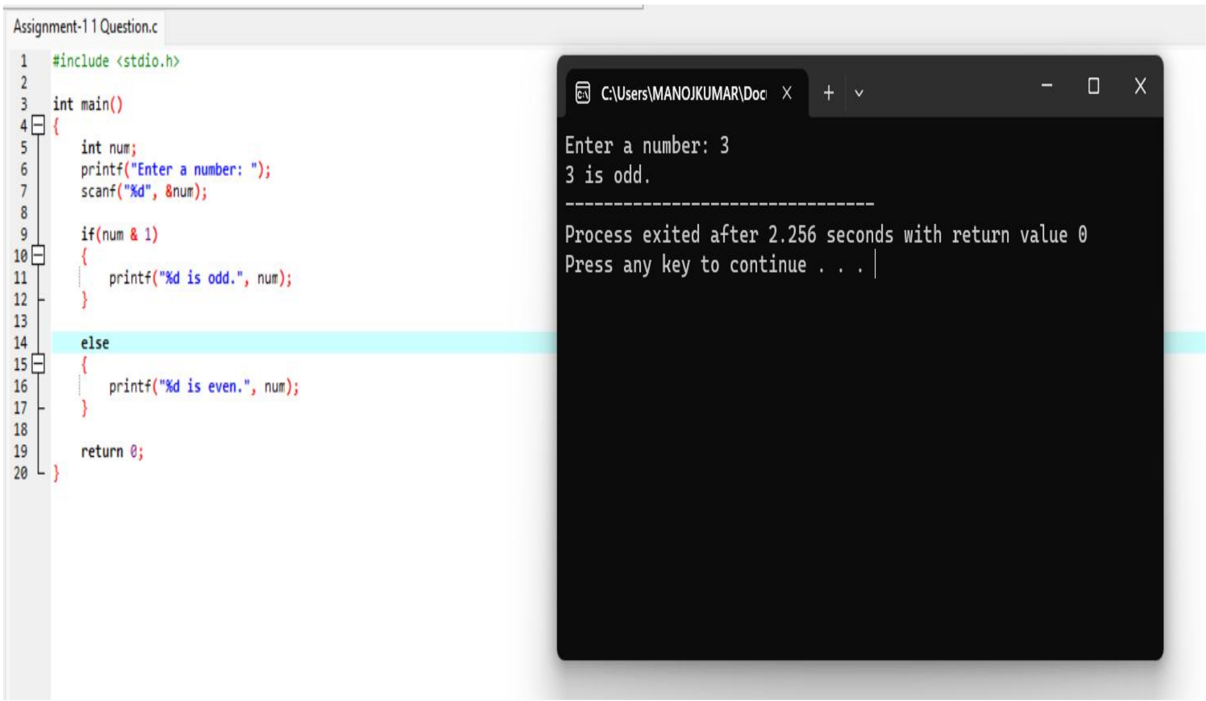
ASSIGNMENT-1

1. Write a C program to determine the given number is odd or even using Bitwise operators.

Program:

```
#include <stdio.h>

int main()
{
   int num;
   printf("Enter a number: ");
          scanf("%d", &num);

   if(num & 1)
   {
      printf("%d is odd.", num);
   }

   else
   {
      printf("%d is even.", num);
   }

   return 0;
}
```



```
#include <stdio.h>

int main()
{
    int num;
    printf("Enter a number: ");
    scanf("%d", &num);

    if(num & 1)
    {
        printf("%d is odd.", num);
    }

    else
    {
        printf("%d is even.", num);
    }

    return 0;
}
```

```
Enter a number: 3
3 is odd.
--------------------------------
Process exited after 2.256 seconds with return value 0
Press any key to continue . . .
```

2. Write a C program to count the number of bits set in a number.

Input:

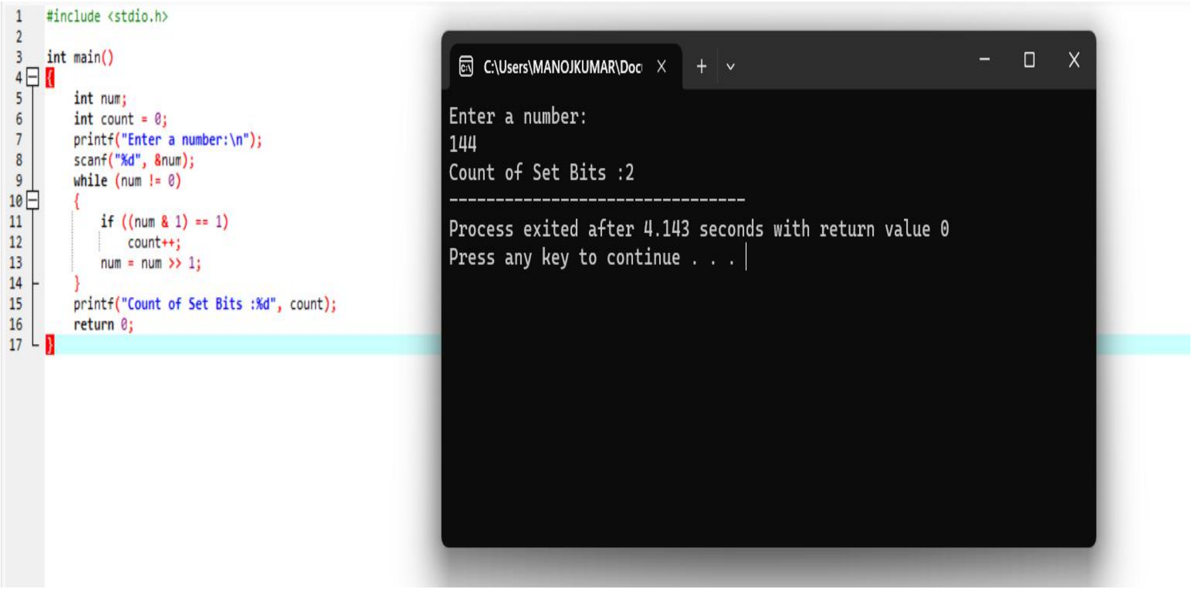
144

Output:

Count of Set bits: 2

Program:

```
#include <stdio.h>

int main()
{
    int num;
    int count = 0;

    printf("Enter a number:\n");
    scanf("%d", &num);
    while (num != 0)
    {
        if ((num & 1) == 1)
            count++;
        num = num >> 1;
    }
    printf("Count of Set Bits :%d", count);
    return 0;
}
```



```
#include <stdio.h>

int main()
{
    int num;
    int count = 0;
    printf("Enter a number:\n");
    scanf("%d", &num);
    while (num != 0)
    {
        if ((num & 1) == 1)
            count++;
        num = num >> 1;
    }
    printf("Count of Set Bits :%d", count);
    return 0;
}
```

```
Enter a number:
144
Count of Set Bits :2
--------------------------------
Process exited after 4.143 seconds with return value 0
Press any key to continue . . .
```

Write a C program to swap two numbers. Use a function pointer to do this operation.

Input:

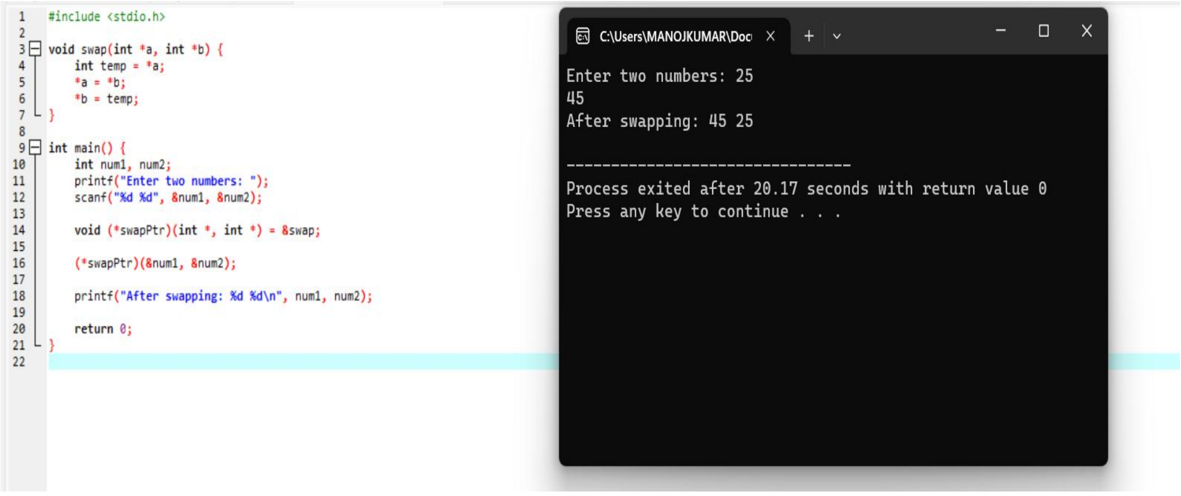
84 25

Output:

25 84

Program:

```
#include <stdio.h>

void swap(int *a, int *b) {
    int temp = *a;
    *a = *b;
    *b = temp;
}

int main() {
    int num1, num2;
    printf("Enter two numbers: ");
    scanf("%d %d", &num1, &num2);

    void (*swapPtr)(int *, int *) = &swap;

    (*swapPtr)(&num1, &num2);

    printf("After swapping: %d %d\n", num1, num2);

    return 0;
}
```



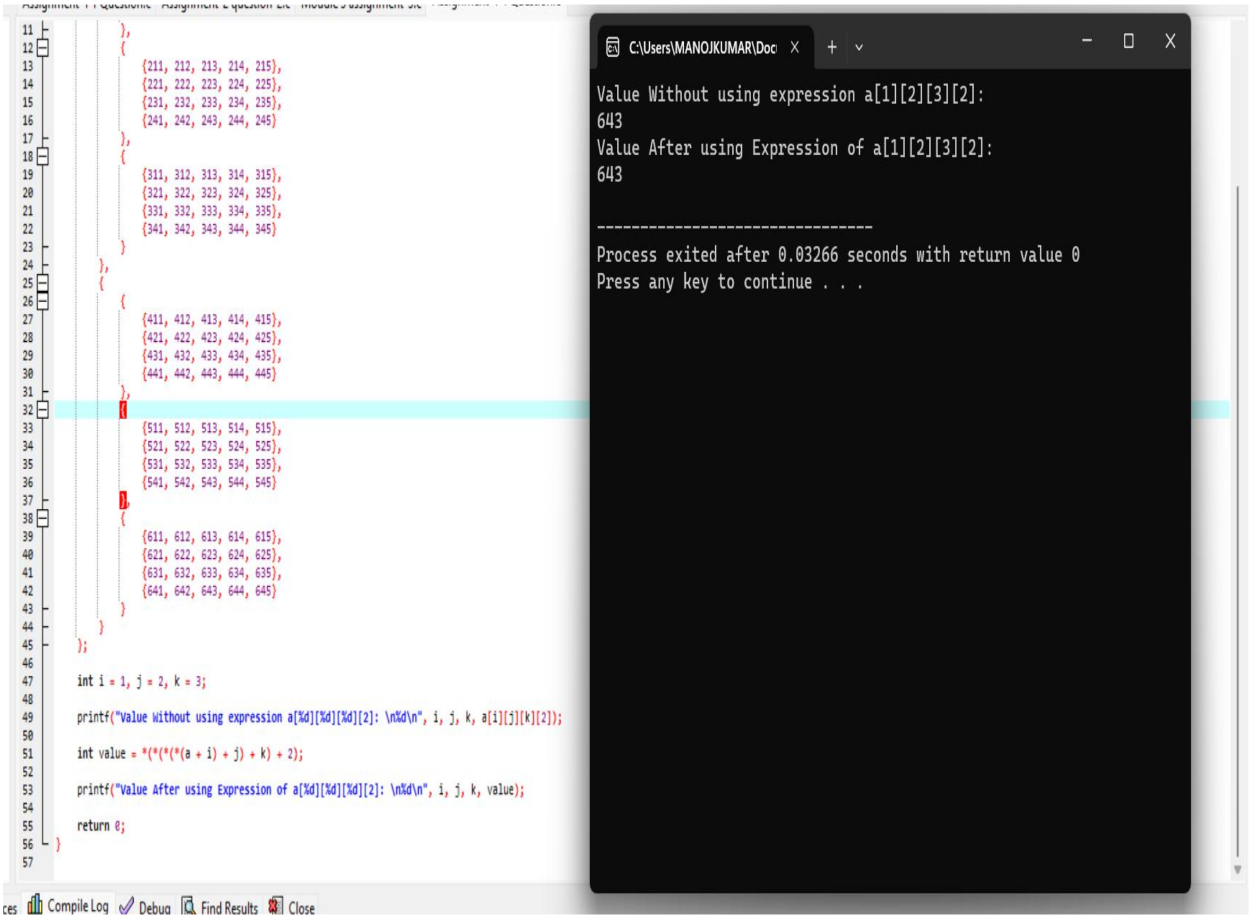
```
#include <stdio.h>

void swap(int *a, int *b) {
    int temp = *a;
    *a = *b;
    *b = temp;
}

int main() {
    int num1, num2;
    printf("Enter two numbers: ");
    scanf("%d %d", &num1, &num2);

    void (*swapPtr)(int *, int *) = &swap;

    (*swapPtr)(&num1, &num2);

    printf("After swapping: %d %d\n", num1, num2);

    return 0;
}
```

```
Enter two numbers: 25
45
After swapping: 45 25

--------------------------------
Process exited after 20.17 seconds with return value 0
Press any key to continue . . .
```

4. Write an equivalent pointer expression for fetching the value of array element a[i][j][k][2]

Program:

```
#include <stdio.h>

int main() {
    int a[2][3][4][5] = {
        {
            {
                {111, 112, 113, 114, 115},
                {121, 122, 123, 124, 125},
                {131, 132, 133, 134, 135},
                {141, 142, 143, 144, 145}
            },
            {
                {211, 212, 213, 214, 215},
                {221, 222, 223, 224, 225},
                {231, 232, 233, 234, 235},
                {241, 242, 243, 244, 245}
            },
            {
                {311, 312, 313, 314, 315},
                {321, 322, 323, 324, 325},
                {331, 332, 333, 334, 335},
                {341, 342, 343, 344, 345}
            }
        },
        {
            {
                {411, 412, 413, 414, 415},
                {421, 422, 423, 424, 425},
                {431, 432, 433, 434, 435},
                {441, 442, 443, 444, 445}
            },
            {
                {511, 512, 513, 514, 515},
                {521, 522, 523, 524, 525},
                {531, 532, 533, 534, 535},
                {541, 542, 543, 544, 545}
            },
            {
                {611, 612, 613, 614, 615},
                {621, 622, 623, 624, 625},
                {631, 632, 633, 634, 635},
                {641, 642, 643, 644, 645}
            }
        }
    };

    int i = 1, j = 2, k = 3;

    printf("Value Without using expression a[%d][%d][%d][2]: \n%d\n", i, j, k,
a[i][j][k][2]);

    int value = *(*(*(*(a + i) + j) + k) + 2);

    printf("Value After using Expression of a[%d][%d][%d][2]: \n%d\n", i, j, k, value);

    return 0;
}
```



```
            },
            {
                {211, 212, 213, 214, 215},
                {221, 222, 223, 224, 225},
                {231, 232, 233, 234, 235},
                {241, 242, 243, 244, 245}
            },
            {
                {311, 312, 313, 314, 315},
                {321, 322, 323, 324, 325},
                {331, 332, 333, 334, 335},
                {341, 342, 343, 344, 345}
            }
        },
        {
            {
                {411, 412, 413, 414, 415},
                {421, 422, 423, 424, 425},
                {431, 432, 433, 434, 435},
                {441, 442, 443, 444, 445}
            },
            {
                {511, 512, 513, 514, 515},
                {521, 522, 523, 524, 525},
                {531, 532, 533, 534, 535},
                {541, 542, 543, 544, 545}
            },
            {
                {611, 612, 613, 614, 615},
                {621, 622, 623, 624, 625},
                {631, 632, 633, 634, 635},
                {641, 642, 643, 644, 645}
            }
        }
    };

    int i = 1, j = 2, k = 3;

    printf("Value Without using expression a[%d][%d][%d][2]: \n%d\n", i, j, k, a[i][j][k][2]);

    int value = *(*(*(*(a + i) + j) + k) + 2);

    printf("Value After using Expression of a[%d][%d][%d][2]: \n%d\n", i, j, k, value);

    return 0;
}
```

```
Value Without using expression a[1][2][3][2]:
643
Value After using Expression of a[1][2][3][2]:
643

--------------------------------
Process exited after 0.03266 seconds with return value 0
Press any key to continue . . .
```

5. Write a C program to Multiply two matrix (n*n) using pointers.

Input:
Output:

Size of Row: 3
Product:

Size of Column: 3
48 39 30

Matrix 1:
102 84 66

2 3 4
129 111 93

5 6 7

8 9 1

Matrix 2:

9 8 7

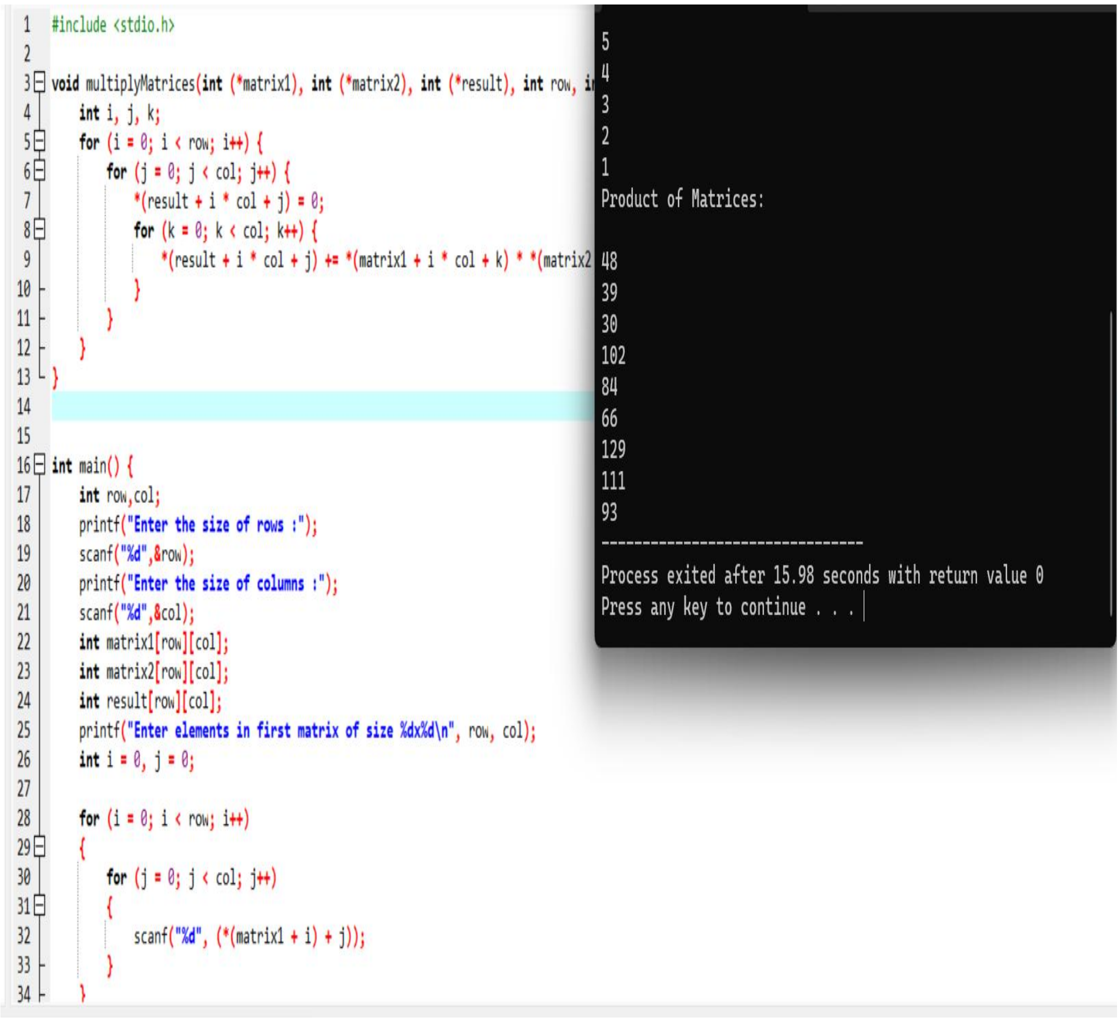
6 5 4

3 2 1

Program:

```
#include <stdio.h>

void multiplyMatrices(int (*matrix1), int (*matrix2), int (*result), int row, int col) {
    int i, j, k;
    for (i = 0; i < row; i++) {
        for (j = 0; j < col; j++) {
            *(result + i * col + j) = 0;
            for (k = 0; k < col; k++) {
                *(result + i * col + j) += *(matrix1 + i * col + k) * *(matrix2 + k * col + j);
            }
        }
    }
}
```

```
int main() {
            int row,col;
            printf("Enter the size of rows :");
            scanf("%d",&row);
            printf("Enter the size of columns :");
            scanf("%d",&col);
    int matrix1[row][col];
    int matrix2[row][col];
    int result[row][col];
    printf("Enter elements in first matrix of size %dx%d\n", row, col);
            int i = 0, j = 0;

    for (i = 0; i < row; i++)
    {
        for (j = 0; j < col; j++)
        {
            scanf("%d", (*(matrix1 + i) + j));
        }
    }
    printf("Enter elements in second matrix of size %dx%d\n", row, col);

    for (i = 0; i < row; i++)
    {
        for (j = 0; j < col; j++)
        {
            scanf("%d", (*(matrix2 + i) + j));
        }

    }

    multiplyMatrices(matrix1, matrix2, result, row, col);
    printf("Product of Matrices:\n");
    for (i = 0; i < row; i++)
    {
        for (j = 0; j < col; j++)
        {
            printf("\n%d", result[i][j]);
        }

    }



    return 0;
}
```



```
#include <stdio.h>

void multiplyMatrices(int (*matrix1), int (*matrix2), int (*result), int row, i
    int i, j, k;
    for (i = 0; i < row; i++) {
        for (j = 0; j < col; j++) {
            *(result + i * col + j) = 0;
            for (k = 0; k < col; k++) {
                *(result + i * col + j) += *(matrix1 + i * col + k) * *(matrix2
            }
        }
    }
}


int main() {
    int row,col;
    printf("Enter the size of rows :");
    scanf("%d",&row);
    printf("Enter the size of columns :");
    scanf("%d",&col);
    int matrix1[row][col];
    int matrix2[row][col];
    int result[row][col];
    printf("Enter elements in first matrix of size %dx%d\n", row, col);
    int i = 0, j = 0;

    for (i = 0; i < row; i++)
    {
        for (j = 0; j < col; j++)
        {
            scanf("%d", (*(matrix1 + i) + j));
        }
    }
```

```
5
4
3
2
1
Product of Matrices:

48
39
30
102
84
66
129
111
93
--------------------------------
Process exited after 15.98 seconds with return value 0
Press any key to continue . . .
```

6. Find the output of the following // Consider the compiler is 32-bit machine

Output: 8

7. Find the output of the following // Consider the compiler is 32-bit machine

Output:16

8. Find the output of the following // Consider the compiler is 32-bit machine

Output:87654321