

PRACTICE LAB ASSIGNMENT 5

1. Write a program to print the following pattern on the output screen.

1 2 3 4 5

1 2 3 4 5

1 2 3 4 5

1 2 3 4 5

1 2 3 4 5

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
int i, j;
```

```
for(i=1; i<=5; i++)
```

```
{
```

```
for(j=1; j<=5; j++)
```

```
{
```

```
printf("%d", j);
```

```
}
```

```
printf("\n");
```

```
}
```

```
}
```

```
#include <stdio.h>
void main()
{
    int i, j;
    for(i=1; i<=5; i++)
    {
        for(j=1; j<=5; j++)
        {
            printf("%d", j);
        }
        printf("\n");
    }
}
```

SS of the OUTPUT

```
student@HP-280-G3-MT: ~/Desktop
student@HP-280-G3-MT:~$ pwd
/home/student
student@HP-280-G3-MT:~$ cd Desktop
student@HP-280-G3-MT:~/Desktop$ ls
a.out  me  q1.c  Untitled Folder
student@HP-280-G3-MT:~/Desktop$ gcc q1.c
student@HP-280-G3-MT:~/Desktop$ ./a.out
12345
12345
12345
12345
12345
student@HP-280-G3-MT:~/Desktop$
```

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2. Write a program to print the following pattern on the output screen.

1

1 2

1 2 3

1 2 3 4

1 2 3 4 5

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
int i, j;
```

```
for(i=1; i<=5; i++)
```

```
{
```

```
for(j=1; j<=i; j++)
```

```
{
```

```
printf("%d", j);
```

```
}
```

```
printf("\n");
```

```
}
```

```
}
```

```
#include <stdio.h>
void main()
{
    int i, j;
    for(i=1; i<=5; i++)
    {
        for(j=1; j<=i; j++)
        {
            printf("%d", j);
        }
        printf("\n");
    }
}
```

SS of the OUTPUT

```
student@HP-280-G3-MT: ~/Desktop
student@HP-280-G3-MT:~$ pwd
/home/student
student@HP-280-G3-MT:~$ cd Desktop
student@HP-280-G3-MT:~/Desktop$ ls
a.out  me  Q1  q2.c  Untitled Folder
student@HP-280-G3-MT:~/Desktop$ gcc q2.c
student@HP-280-G3-MT:~/Desktop$ ./a.out
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
student@HP-280-G3-MT:~/Desktop$
```

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3. Write a program to print the following pattern on the output screen.

```
1
2 1
3 2 1
4 3 2 1
5 4 3 2 1
```

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
int i, j;
```

```
for(i=1; i<=5; i++)
```

```
{
```

```
for(j=i; j>=1; j--)
```

```
{
```

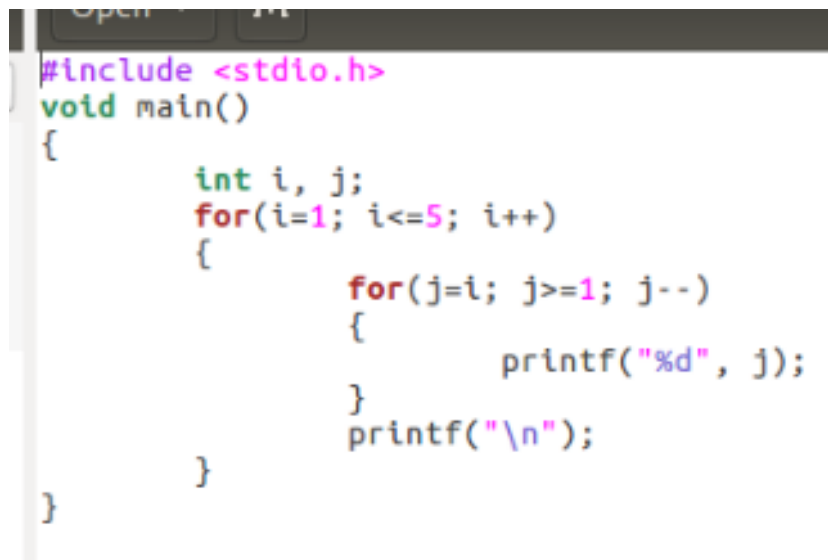
```
printf("%d", j);
```

```
}
```

```
printf("\n");
```

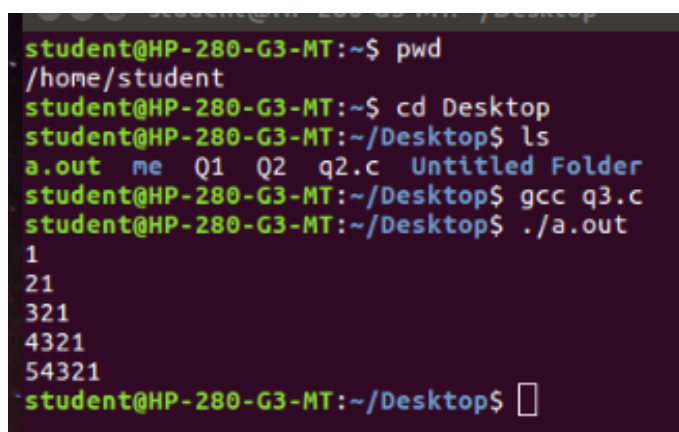
```
}
```

```
}
```

A screenshot of a text editor window showing a C program. The code is for printing a pattern of numbers. It includes a header file, a main function, and nested loops for i and j. The output of the program is shown in the next block.

```
Open  File  Edit  View  Help
#include <stdio.h>
void main()
{
    int i, j;
    for(i=1; i<=5; i++)
    {
        for(j=i; j>=1; j--)
        {
            printf("%d", j);
        }
        printf("\n");
    }
}
```

SS of the OUTPUT

A screenshot of a terminal window showing the execution of the C program. The user runs 'pwd', 'cd Desktop', 'ls', 'gcc q3.c', and './a.out'. The output of the program is displayed as a pattern of numbers.

```
student@HP-280-G3-MT:~$ pwd
/home/student
student@HP-280-G3-MT:~$ cd Desktop
student@HP-280-G3-MT:~/Desktop$ ls
a.out  me  Q1  Q2  q2.c  Untitled Folder
student@HP-280-G3-MT:~/Desktop$ gcc q3.c
student@HP-280-G3-MT:~/Desktop$ ./a.out
1
2 1
3 2 1
4 3 2 1
5 4 3 2 1
student@HP-280-G3-MT:~/Desktop$
```

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4. Write a program using "Nested for" loop to print the following pattern on the output screen.

1

0 1

1 0 1

0 1 0 1

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
int i, j;
```

```
for(i=1; i<=4; i++)
```

```
{
```

```
for(j=i; j>=1; j--)
```

```
{
```

```
if(j%2 == 0)
```

```
printf("0");
```

```
else
```

```
printf("1");
```

```
}
```

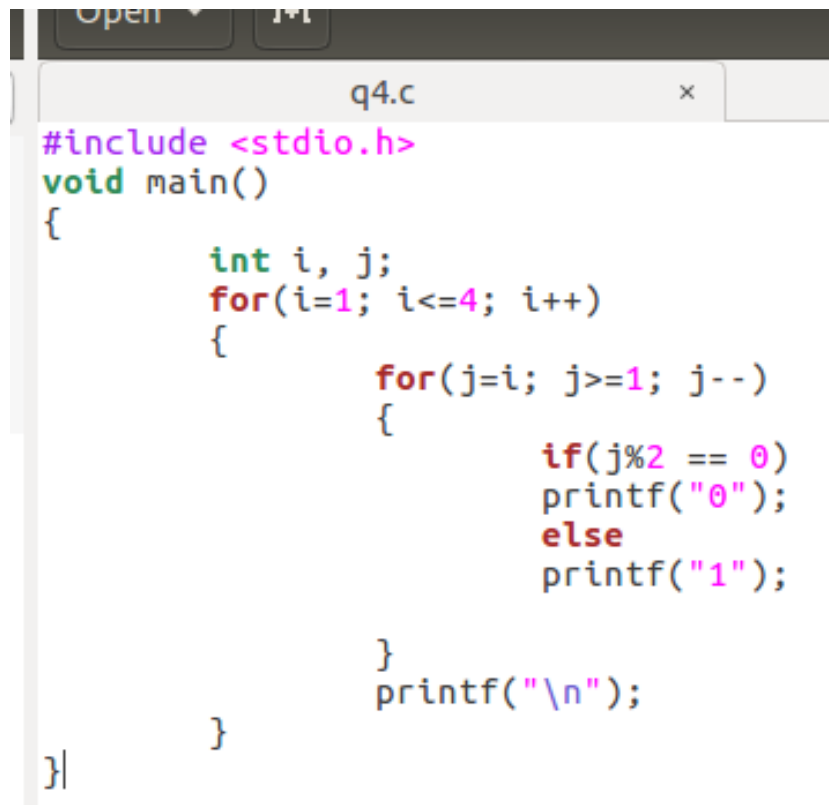
```
printf("\n");
```

```
}
```

```
}
```

SS of the OUTPUT

```
student@HP-280-G3-MT:~$ pwd
/home/student
student@HP-280-G3-MT:~$ cd Desktop
student@HP-280-G3-MT:~/Desktop$ ls
a.out  me  Q1  Q2  q2.c  Q3  q4.c  Q5  q5.c  Untitled Folder
student@HP-280-G3-MT:~/Desktop$ gcc q4.c
student@HP-280-G3-MT:~/Desktop$ ./a.out
1
0 1
1 0 1
0 1 0 1
student@HP-280-G3-MT:~/Desktop$
```

A screenshot of a code editor window titled 'q4.c'. The code is a C program that prints a pattern of 0s and 1s. It includes the standard input/output header, a main function, and nested loops. The outer loop iterates from i=1 to i=4. The inner loop iterates from j=i down to j=1. Inside the inner loop, it checks if j is even (j%2 == 0). If true, it prints '0'; otherwise, it prints '1'. After each inner loop iteration, it prints a newline character. The code is color-coded: keywords in green, variables in blue, and string literals in red.

```
#include <stdio.h>
void main()
{
    int i, j;
    for(i=1; i<=4; i++)
    {
        for(j=i; j>=1; j--)
        {
            if(j%2 == 0)
                printf("0");
            else
                printf("1");
        }
        printf("\n");
    }
}
```

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5. Write a program to print the following pattern on the output screen.

1

1 0

1 0 1

1 0 1 0

1 0 1 0 1

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
int i, j;
```

```
for(i=1; i<=5; i++)
```

```
{
```

```
for(j=1; j<=i; j++)
```

```
{
```

```
if(j%2 == 0)
```

```
printf("0");
```

```
else
```

```
printf("1");
```

```
}
```

```
printf("\n");
```

```
}
```

```
}
```

```
#include <stdio.h>
void main()
{
    int i, j;
    for(i=1; i<=5; i++)
    {
        for(j=1; j<=i; j++)
        {
            if(j%2 == 0)
                printf("0");
            else
                printf("1");
        }
        printf("\n");
    }
}
```

SS of the OUTPUT

```
student@HP-280-G3-MT:~$ pwd
/home/student
student@HP-280-G3-MT:~$ cd Desktop
student@HP-280-G3-MT:~/Desktop$ ls
a.out  me  Q1  Q2  q2.c  Q3  q4.c  q5.c  Untitled Folder
student@HP-280-G3-MT:~/Desktop$ gcc q5.c
student@HP-280-G3-MT:~/Desktop$ ./a.out
1
1 0
1 0 1
1 0 1 0
1 0 1 0 1
student@HP-280-G3-MT:~/Desktop$
```

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6. Write a C program to find a peculiar 2-digit number which is three times the sum of its digits.

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
    int i, n;
```

```
    for(i = 10; i <= 99; i++)
```

```
    {
```

```
        if (i == (3 * ((i%10) + (i/10))))
```

```
        {
```

```
            n = 1;
```

```
            printf("The peculiar two digit number which is three times the sum of its digits is %d",
```

```
i);
```

```
        }
```

```
    else
```

```
        n = 0;
```

```
    }
```

```
}
```

```
#include <stdio.h>

void main()
{
    int i, n;
    for(i = 10; i <= 99; i++)
    {
        if (i == (3 * ((i%10) + (i/10))))
        {
            n = 1;
            printf("The peculiar two digit number which is three times the sum of its digits is %d", i);
        }
        else
            n = 0;
    }
}
```

SS of the OUTPUT

```
...Program finished with exit code 54
Press ENTER to exit console.
```

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7. Write a program to print the following pattern on the output screen.

```
*  
  
***  
  
*****  
  
*****  
  
*****
```

CODE

```
#include <stdio.h>  
  
void main()  
{  
    int i, j, l;  
    for(i = 1; i <= 5; ++i, l = 0)  
    {  
        for(j = 1; j <= (5 - i); j++)  
        {  
            printf(" ");  
        }  
        while(l != ((2 * i) - 1))  
        {  
            printf("*");  
            l++;  
        }  
        printf("\n");  
    }  
}
```

SS of the OUTPUT

```
#include <stdio.h>  
void main()  
{  
    int i, j, l;  
    for(i = 1; i <= 5; ++i, l = 0)  
    {  
        for(j = 1; j <= (5 - i); j++)  
        {  
            printf(" ");  
        }  
        while(l != ((2 * i) - 1))  
        {  
            printf("*");  
            l++;  
        }  
        printf("\n");  
    }  
}
```

```
*  
***  
*****  
*****  
*****  
  
...Program finished with exit code 10  
Press ENTER to exit console.
```

8. Write a program to print the following pattern on the output screen.


```
*  
  
*A*  
  
*A*A*  
  
*A*A*A*
```

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{  
    int i, j, l = 7;  
    for(i = 1; i <= l; i++)  
    {  
        for(j = 1; j < l; j++)  
        {  
            printf(" ");  
        }  
        l--;  
        for(j = 1; j <= ((2 * i) - 1); j++)  
        {  
            if(j % 2 == 1)  
                printf("*");  
            else  
                printf("A");  
        }  
        printf("\n");  
    }  
}
```



```
#include <stdio.h>  
void main()  
{  
    int i, j, l = 7;  
    for(i = 1; i <= l; i++)  
    {  
        for(j = 1; j < l; j++)  
        {  
            printf(" ");  
        }  
        l--;  
        for(j = 1; j <= ((2 * i) - 1); j++)  
        {  
            if(j % 2 == 1)  
                printf("*");  
            else  
                printf("A");  
        }  
        printf("\n");  
    }  
}
```


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}

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```
  *
 *A*
*A*A*
*A*A*A*

...Program finished with exit code 5
Press ENTER to exit console.
```

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9. Write a program to print the following pattern

```
*  
  
* *  
  
* * *  
  
* * * *  
  
* * * * *  
  
* * * *  
  
* * *  
  
* *  
  
*
```

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
int i, j;
```

```
for(i=1; i<=5; i++)
```

```
{
```

```
for(j=1; j<=i; j++)
```

```
{
```

```
printf("*");
```

```
}
```

```
printf("\n");
```

```
}
```

```
for(i=1; i<=4; i++)
```

```
{
```

```
for(j=i; j<=4; j++)
```

```
{
```

```
#include <stdio.h>  
void main()  
{  
    int i, j;  
    for(i=1; i<=5; i++)  
    {  
        for(j=1; j<=i; j++)  
        {  
            printf("*");  
        }  
        printf("\n");  
    }  
    for(i=1; i<=4; i++)  
    {  
        for(j=i; j<=4; j++)  
        {  
            printf("*");  
        }  
        printf("\n");  
    }  
}
```

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```
printf("*");
```

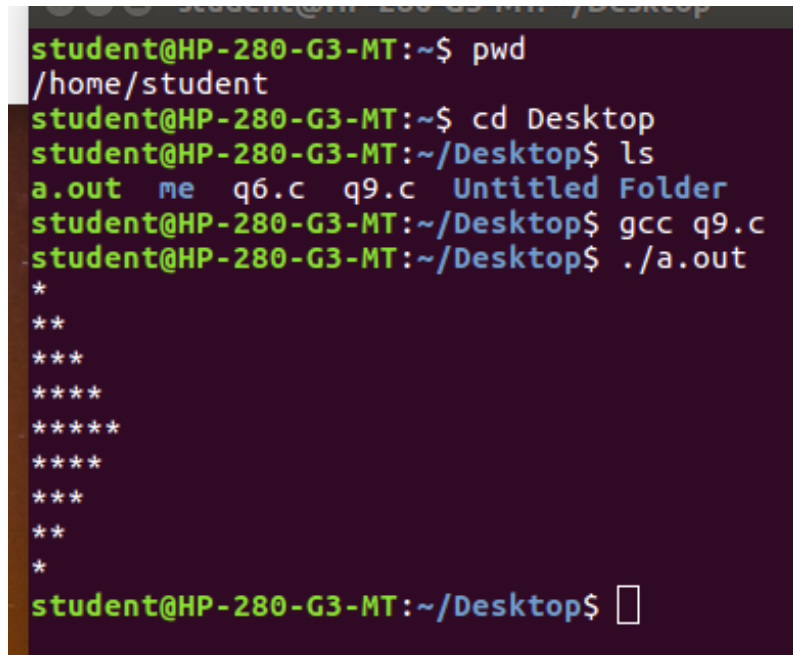
```
}
```

```
printf("\n");
```

```
}
```

```
}
```

SS of the OUTPUT



```
student@HP-280-G3-MT:~/Desktop$ pwd
/home/student
student@HP-280-G3-MT:~/Desktop$ cd Desktop
student@HP-280-G3-MT:~/Desktop$ ls
a.out  me  q6.c  q9.c  Untitled Folder
student@HP-280-G3-MT:~/Desktop$ gcc q9.c
student@HP-280-G3-MT:~/Desktop$ ./a.out
*
**
***
****
*****
****
****
***
**
*
student@HP-280-G3-MT:~/Desktop$
```

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10. Write a program to print the following pattern

1

2 1 2

3 2 1 2 3

4 3 2 1 2 3 4

5 4 3 2 1 2 3 4 5

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
    int i, j;
```

```
    for(i = 1; i <= 5; i++)
```

```
    {
```

```
        for(j = i; j >= 1; j--)
```

```
        {
```

```
            printf("%d", j);
```

```
        }
```

```
        for(j = 2; j <= i; j++)
```

```
        {
```

```
            printf("%d", j);
```

```
        }
```

```
        printf("\n");
```

```
    }
```

```
}
```

SS of the OUTPUT

```
#include <stdio.h>
void main()
{
    int i, j;
    for(i = 1; i <= 5; i++)
    {
        for(j = i; j >= 1; j--)
        {
            printf("%d", j);
        }
        for(j = 2; j <= i; j++)
        {
            printf("%d", j);
        }
        printf("\n");
    }
}
```

```
1
212
32123
4321234
543212345

...Program finished with exit code 10
Press ENTER to exit console.
```

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11. Write a menu-driven program (using switch control statements) containing following programs:

(i) Factorial of any number

(ii) Prime Number

(iii) Even or Odd number

CODE

```
#include <stdio.h>
```

```
void main()
```

```
{
```

```
    int n, f, i, d = 1, F = 1, N, p, k = 2, flag = 0;
```

```
    printf("\nNumber 1 to find the factorial of any number");
```

```
    printf("\nNumber 2 to find if the entered number is prime");
```

```
    printf("\nNumber 3 to find if the entered number is odd or even");
```

```
    printf("\nEnter your choice: ");
```

```
    scanf("%d", &n);
```

```
    switch(n)
```

```
    {
```

```
        default:
```

```
        {
```

```
            printf("\nWrong input");
```

```
            break;
```

```
        }
```

```
        case 1:
```

```
        {
```

```
            printf("\nEnter any positive integer to find its FACTORIAL: ");
```

```
            scanf("%d", &f);
```

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```
    if(f <= 0)

        printf("Please enter a postive integer");

    else

    {

        for(i = f; i >= 1; i--)

            F = F * i;

        printf("The Factorial of your number is %d", F);

    }

    break;

}

case 2:

{

    printf("\nEnter any integer to find if it is a PRIME number: ");

    scanf("%d", &p);

    if(p == 0 || p == 1)

        printf("Invalid Numbers\n");

    else

    {

        while(k <= (p/2))

        {

            if(p%k == 0)

            {

                printf("Number is NOT prime");

                flag++;

                break;

            }

            k++;

        }

    }

}
```

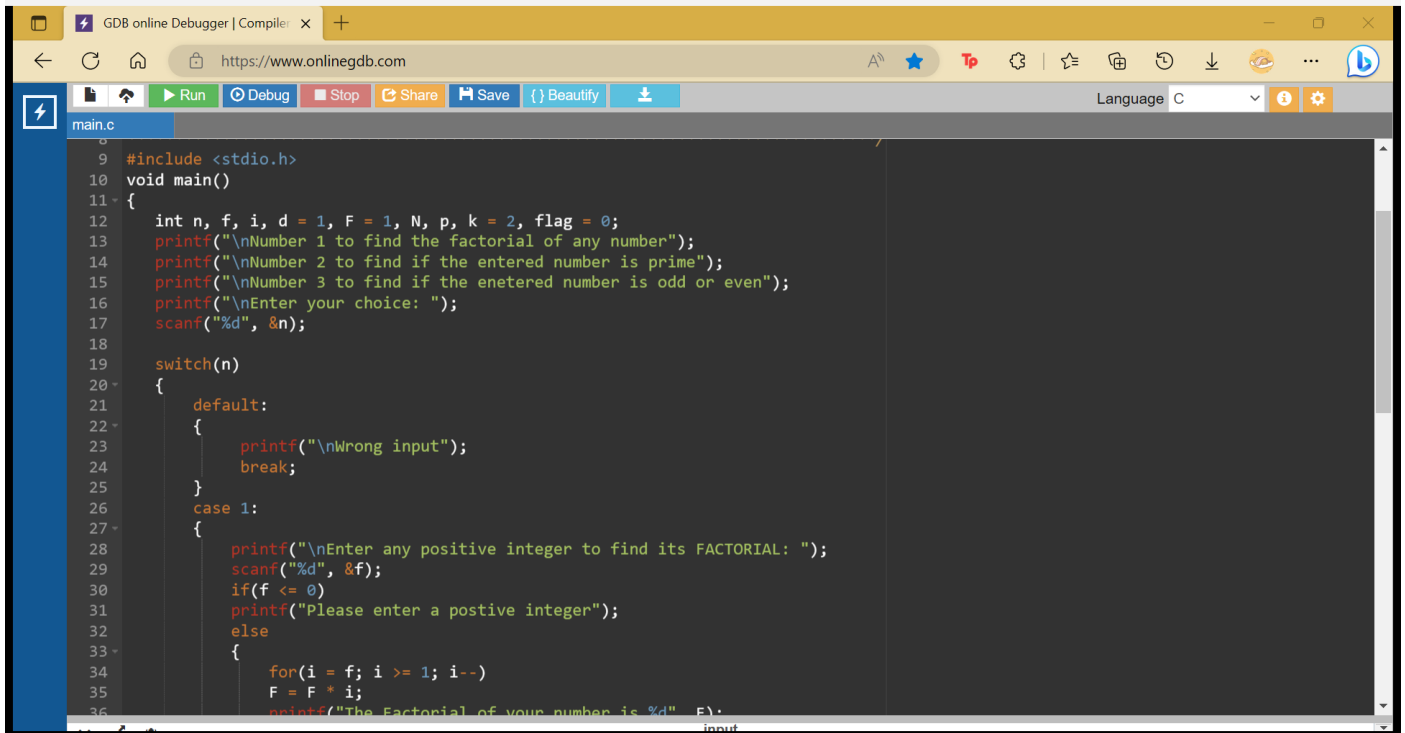
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```
        }  
    }  
    if(flag != 1)  
        printf("Number is prime");  
    break;  
}  
case 3:  
{  
    printf("\nEnter any integer to find if its an ODD or EVEN number: ");  
    scanf("%d", &N);  
    if(N % 2 == 0)  
        printf("The entered intger is EVEN");  
    else  
        printf("The entered integer is ODD");  
    break;  
}  
  
}  
}
```

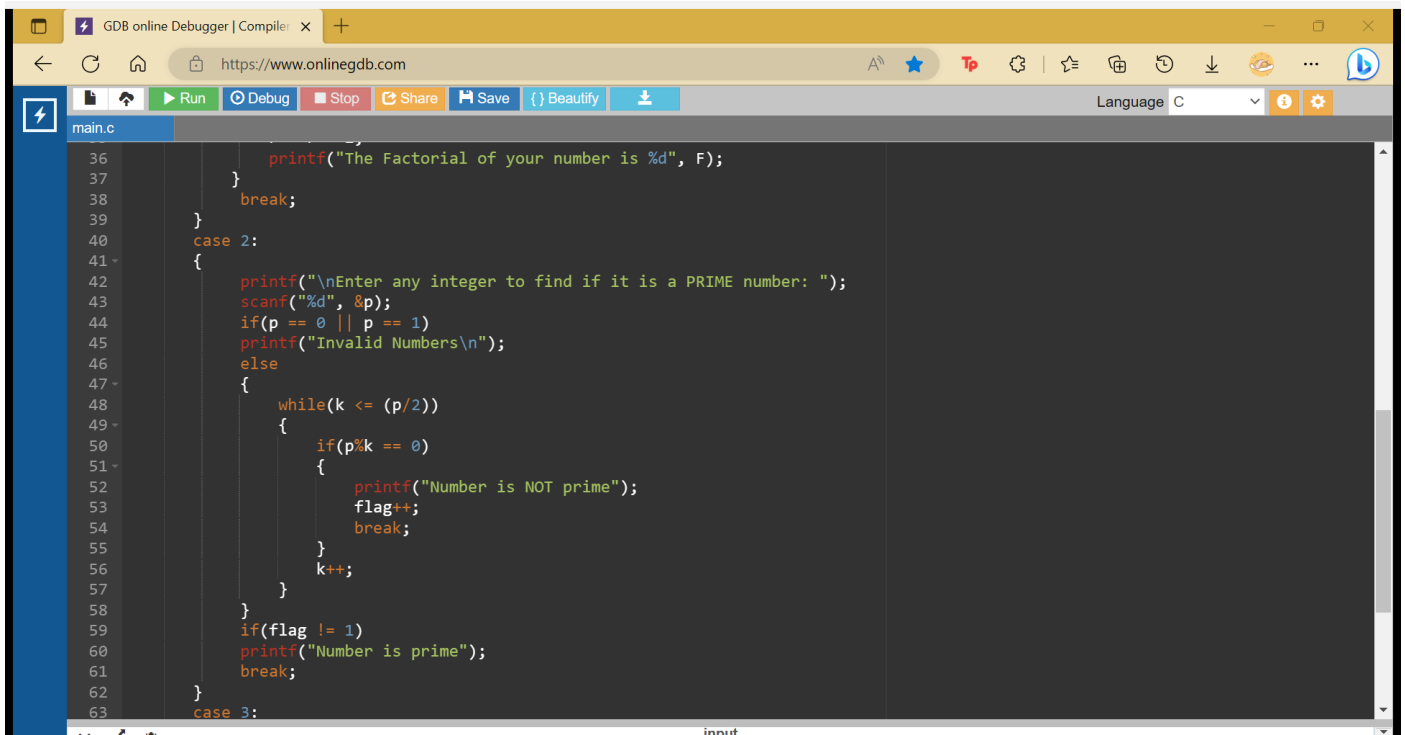
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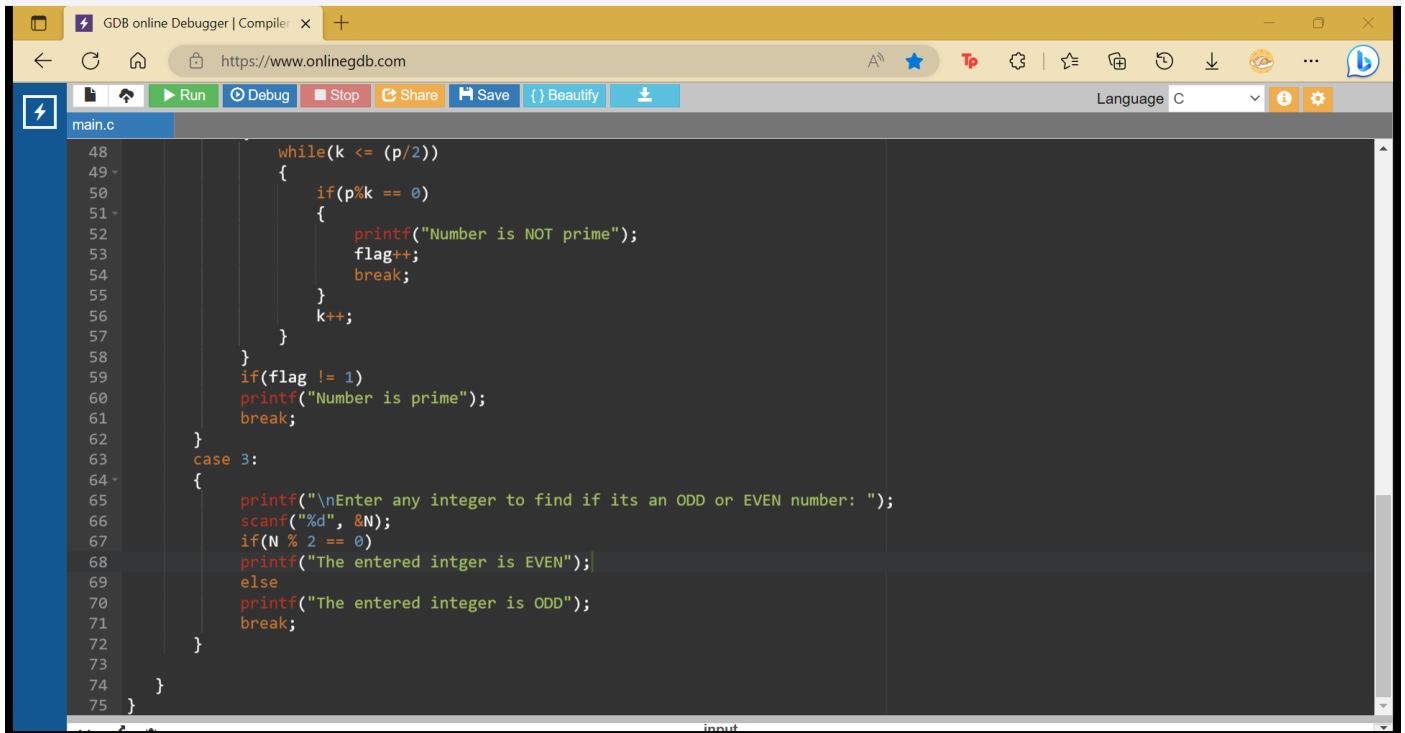
```
main.c
#include <stdio.h>
void main()
{
    int n, f, i, d = 1, F = 1, N, p, k = 2, flag = 0;
    printf("\nNumber 1 to find the factorial of any number");
    printf("\nNumber 2 to find if the entered number is prime");
    printf("\nNumber 3 to find if the entered number is odd or even");
    printf("\nEnter your choice: ");
    scanf("%d", &n);

    switch(n)
    {
        default:
        {
            printf("\nWrong input");
            break;
        }
        case 1:
        {
            printf("\nEnter any positive integer to find its FACTORIAL: ");
            scanf("%d", &f);
            if(f <= 0)
                printf("Please enter a positive integer");
            else
            {
                for(i = f; i >= 1; i--)
                    F = F * i;
                printf("The Factorial of your number is %d", F);
            }
        }
    }
}
```



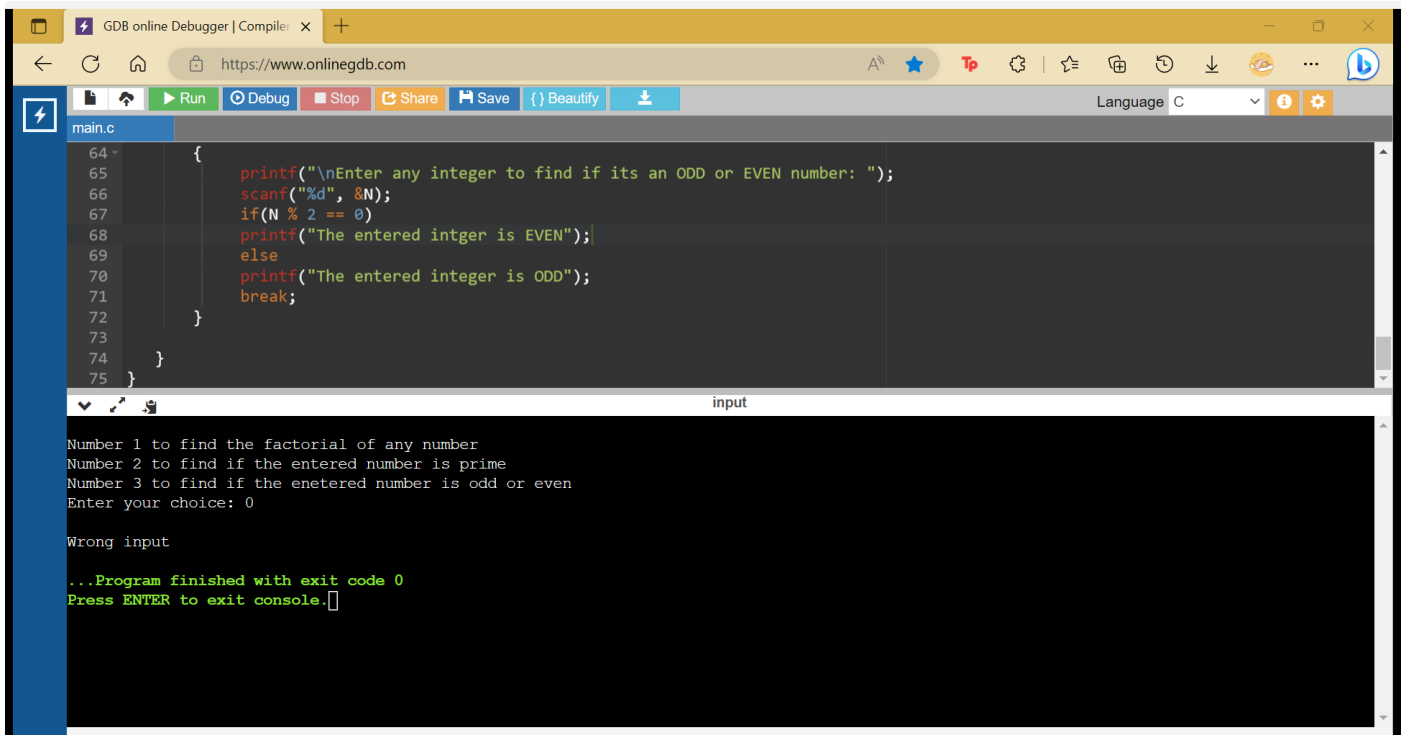
```
main.c
    printf("The Factorial of your number is %d", F);
    break;
}
case 2:
{
    printf("\nEnter any integer to find if it is a PRIME number: ");
    scanf("%d", &p);
    if(p == 0 || p == 1)
        printf("Invalid Numbers\n");
    else
    {
        while(k <= (p/2))
        {
            if(p%k == 0)
            {
                printf("Number is NOT prime");
                flag++;
                break;
            }
            k++;
        }
        if(flag != 1)
            printf("Number is prime");
        break;
    }
}
case 3:
{
    printf("\nEnter any integer to find if it is an ODD or EVEN number: ");
    scanf("%d", &o);
    if(o % 2 == 0)
        printf("Number is EVEN");
    else
        printf("Number is ODD");
    break;
}
}
```


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The screenshot shows the GDB online Debugger interface with a C program. The code is as follows:

```
48     while(k <= (p/2))
49     {
50         if(p%k == 0)
51         {
52             printf("Number is NOT prime");
53             flag++;
54             break;
55         }
56         k++;
57     }
58 }
59 if(flag != 1)
60 printf("Number is prime");
61 break;
62 }
63 case 3:
64 {
65     printf("\nEnter any integer to find if its an ODD or EVEN number: ");
66     scanf("%d", &N);
67     if(N % 2 == 0)
68         printf("The entered intger is EVEN");
69     else
70         printf("The entered integer is ODD");
71     break;
72 }
73 }
74 }
75 }
```



The screenshot shows the GDB online Debugger interface with the same C program. The code is as follows:

```
64 {
65     printf("\nEnter any integer to find if its an ODD or EVEN number: ");
66     scanf("%d", &N);
67     if(N % 2 == 0)
68         printf("The entered integer is EVEN");
69     else
70         printf("The entered integer is ODD");
71     break;
72 }
73 }
74 }
75 }
```

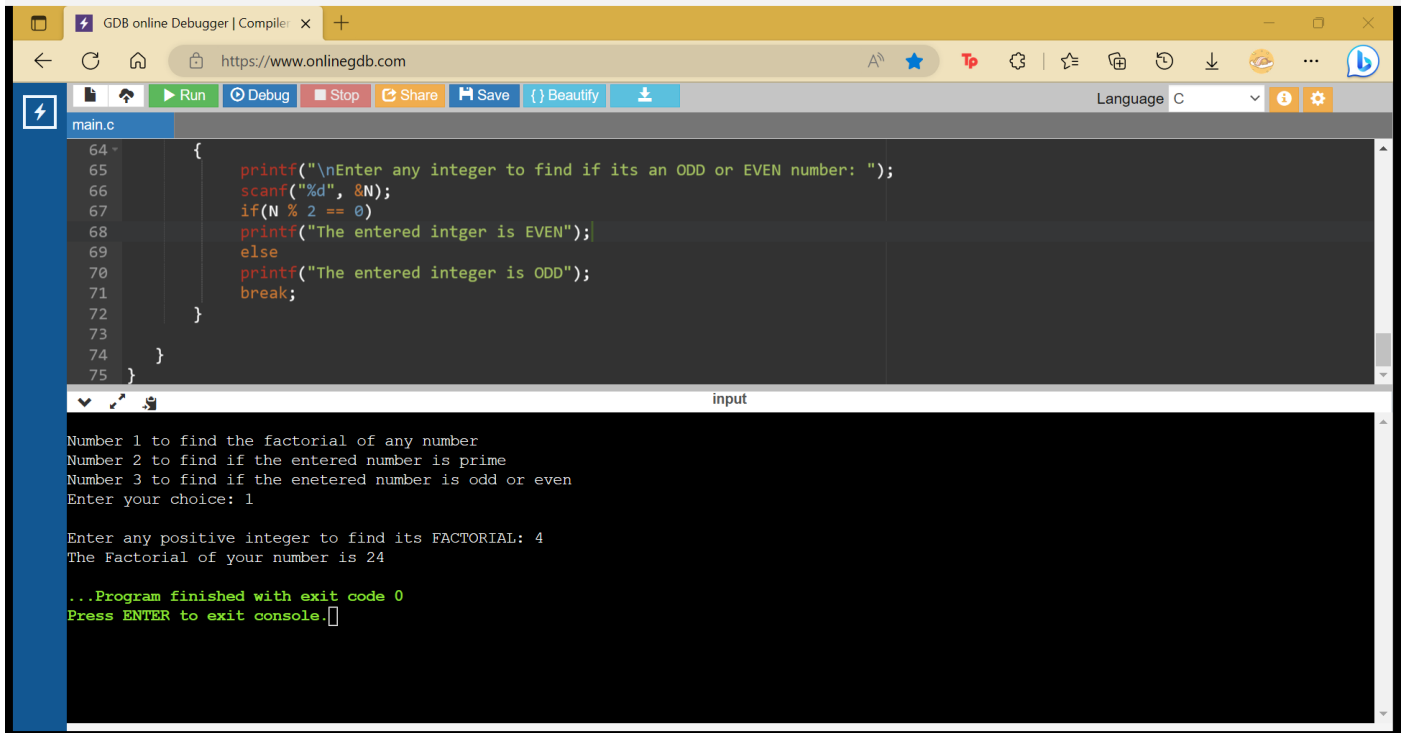
The output of the program is shown in the console:

```
Number 1 to find the factorial of any number
Number 2 to find if the entered number is prime
Number 3 to find if the entered number is odd or even
Enter your choice: 0

Wrong input

...Program finished with exit code 0
Press ENTER to exit console.
```

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ROLL NO.: 2210110505



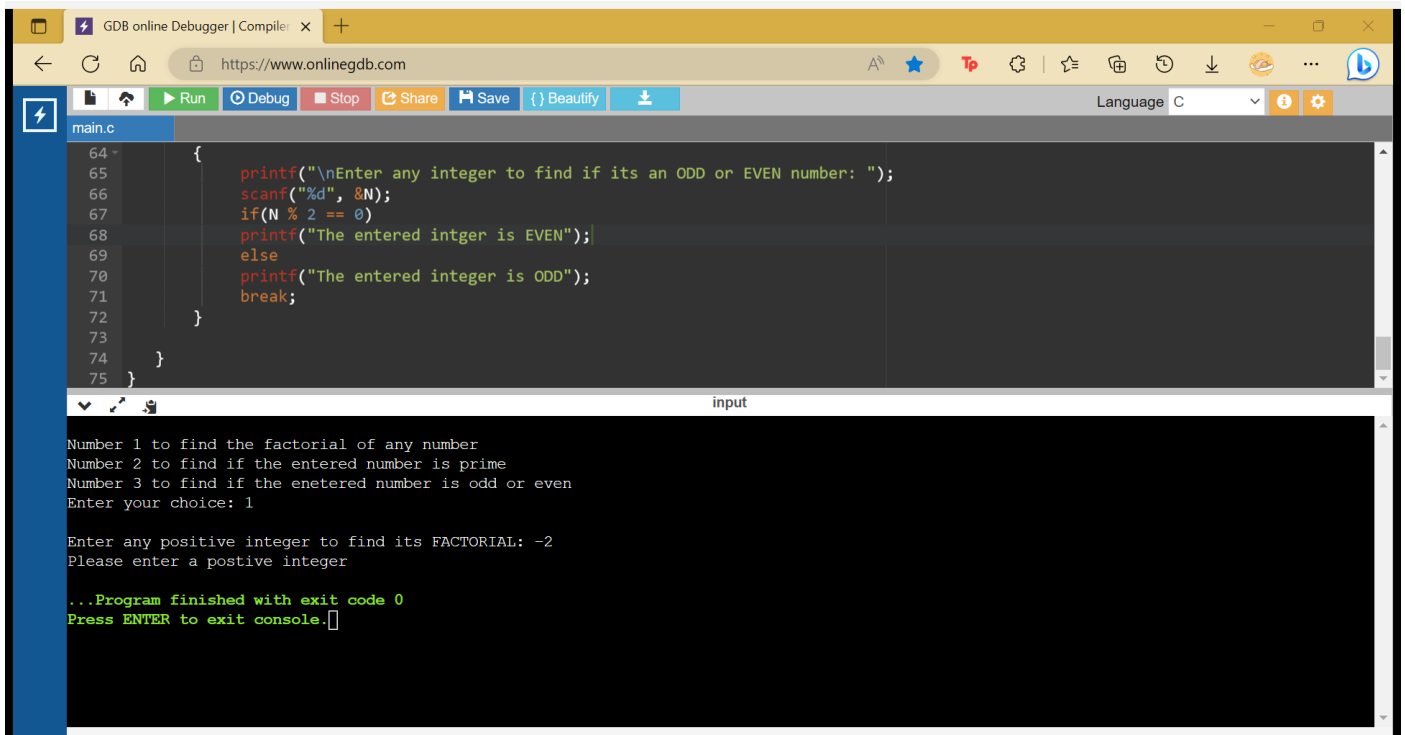
```
main.c
64
65 {
66     printf("\nEnter any integer to find if its an ODD or EVEN number: ");
67     scanf("%d", &N);
68     if(N % 2 == 0)
69         printf("The entered integer is EVEN");
70     else
71         printf("The entered integer is ODD");
72     break;
73 }
74 }
75 }
```

input

Number 1 to find the factorial of any number
Number 2 to find if the entered number is prime
Number 3 to find if the entered number is odd or even
Enter your choice: 1

Enter any positive integer to find its FACTORIAL: 4
The Factorial of your number is 24

...Program finished with exit code 0
Press ENTER to exit console.



```
main.c
64
65 {
66     printf("\nEnter any integer to find if its an ODD or EVEN number: ");
67     scanf("%d", &N);
68     if(N % 2 == 0)
69         printf("The entered integer is EVEN");
70     else
71         printf("The entered integer is ODD");
72     break;
73 }
74 }
75 }
```

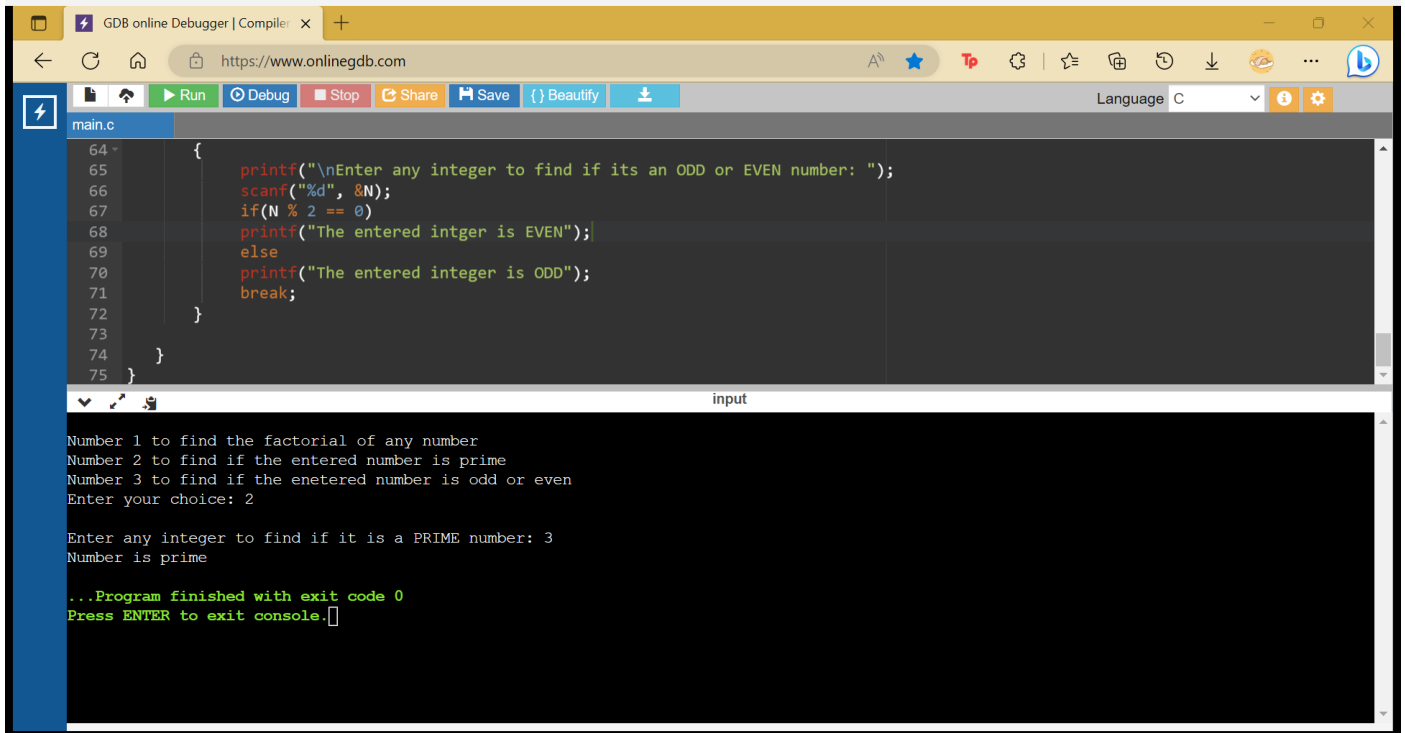
input

Number 1 to find the factorial of any number
Number 2 to find if the entered number is prime
Number 3 to find if the entered number is odd or even
Enter your choice: 1

Enter any positive integer to find its FACTORIAL: -2
Please enter a postive integer

...Program finished with exit code 0
Press ENTER to exit console.

NAME: REYA JESLYN SAHAYA SAMUEL
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The screenshot shows the GDB online Debugger interface. The top bar includes the title 'GDB online Debugger | Compiler', the URL 'https://www.onlinegdb.com', and various icons for navigation and settings. Below the bar is a toolbar with buttons for Run, Debug, Stop, Share, Save, and Beautify. The main editor displays the source code for 'main.c' with line numbers 64 to 75. The code prompts the user to enter an integer to check if it is odd or even. The console output shows the program's execution: it prompts for a choice, the user enters '2', it prompts for an integer, the user enters '3', and it outputs 'Number is prime'. The program then finishes with exit code 0.

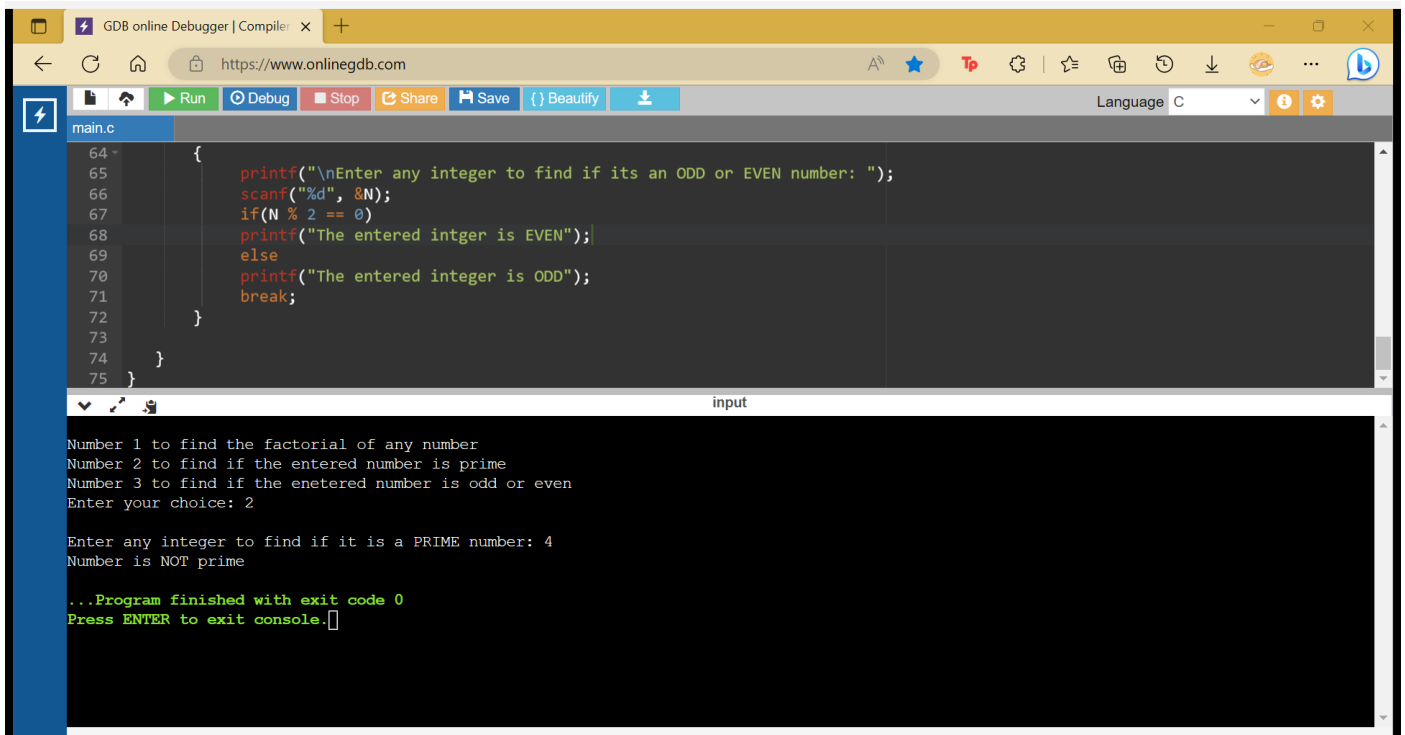
```
main.c
64
65 {
66     printf("\nEnter any integer to find if its an ODD or EVEN number: ");
67     scanf("%d", &N);
68     if(N % 2 == 0)
69         printf("The entered intger is EVEN");
70     else
71         printf("The entered integer is ODD");
72     break;
73 }
74 }
75 }
```

input

Number 1 to find the factorial of any number
Number 2 to find if the entered number is prime
Number 3 to find if the entered number is odd or even
Enter your choice: 2

Enter any integer to find if it is a PRIME number: 3
Number is prime

...Program finished with exit code 0
Press ENTER to exit console.



This screenshot is similar to the first one, showing the same GDB online Debugger interface and source code. However, the console output shows a different execution path: the user enters '4' as their choice, and then enters '4' as the integer. The program outputs 'Number is NOT prime' and then finishes with exit code 0.

```
main.c
64
65 {
66     printf("\nEnter any integer to find if its an ODD or EVEN number: ");
67     scanf("%d", &N);
68     if(N % 2 == 0)
69         printf("The entered intger is EVEN");
70     else
71         printf("The entered integer is ODD");
72     break;
73 }
74 }
75 }
```

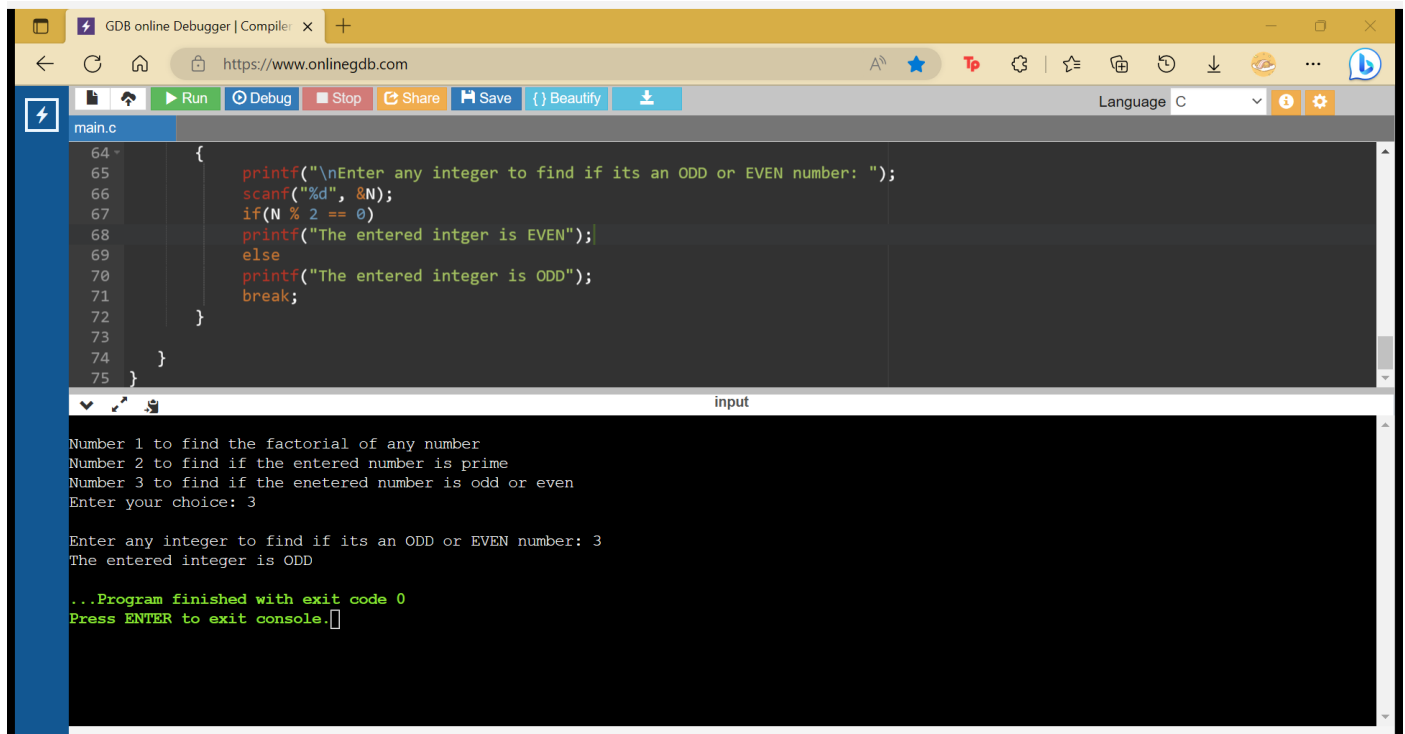
input

Number 1 to find the factorial of any number
Number 2 to find if the entered number is prime
Number 3 to find if the entered number is odd or even
Enter your choice: 2

Enter any integer to find if it is a PRIME number: 4
Number is NOT prime

...Program finished with exit code 0
Press ENTER to exit console.

NAME: REYA JESLYN SAHAYA SAMUEL
ROLL NO.: 2210110505

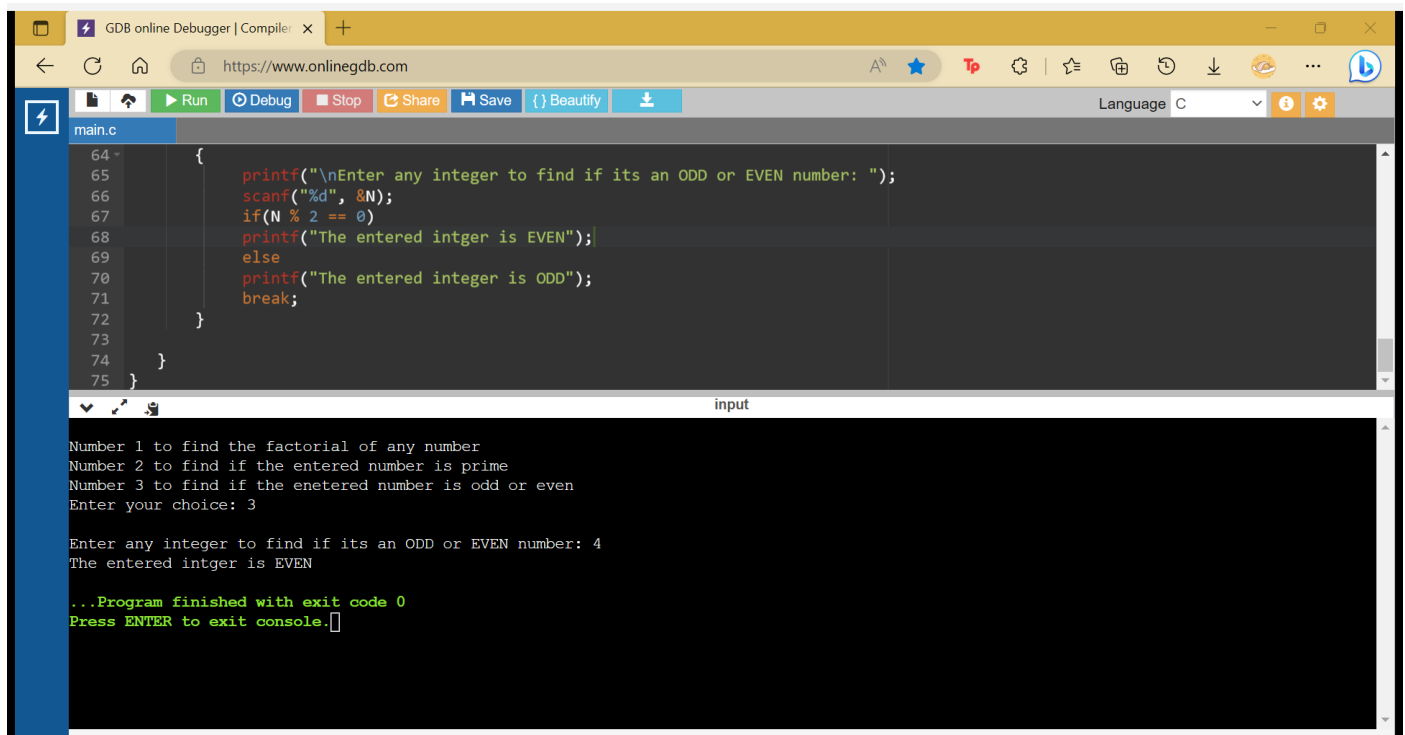


The screenshot shows the GDB online Debugger interface. The top bar includes the URL <https://www.onlinegdb.com> and a toolbar with buttons for Run, Debug, Stop, Share, Save, and Beautify. The language is set to C. The code editor displays the following C code in `main.c`:

```
64 {  
65     printf("\nEnter any integer to find if its an ODD or EVEN number: ");  
66     scanf("%d", &N);  
67     if(N % 2 == 0)  
68         printf("The entered intger is EVEN");  
69     else  
70         printf("The entered integer is ODD");  
71     break;  
72 }  
73  
74 }  
75 }
```

The console output shows the program's execution:

```
Number 1 to find the factorial of any number  
Number 2 to find if the entered number is prime  
Number 3 to find if the entered number is odd or even  
Enter your choice: 3  
  
Enter any integer to find if its an ODD or EVEN number: 3  
The entered integer is ODD  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```



The screenshot shows the GDB online Debugger interface. The top bar includes the URL <https://www.onlinegdb.com> and a toolbar with buttons for Run, Debug, Stop, Share, Save, and Beautify. The language is set to C. The code editor displays the following C code in `main.c`:

```
64 {  
65     printf("\nEnter any integer to find if its an ODD or EVEN number: ");  
66     scanf("%d", &N);  
67     if(N % 2 == 0)  
68         printf("The entered intger is EVEN");  
69     else  
70         printf("The entered integer is ODD");  
71     break;  
72 }  
73  
74 }  
75 }
```

The console output shows the program's execution:

```
Number 1 to find the factorial of any number  
Number 2 to find if the entered number is prime  
Number 3 to find if the entered number is odd or even  
Enter your choice: 3  
  
Enter any integer to find if its an ODD or EVEN number: 4  
The entered intger is EVEN  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```