Jayoti Vidyapeeth Women's University

BASIC PROGRAM BOOK FOR C LEARNING

- JV'n Mrs. AYUSHI SHUKLA

JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

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Faculty of Education & Methodology

ABOUT C PROGRAMMING

A **programming language** is a vocabulary and set of grammatical rules for instructing a computer or computing device to perform specific tasks. The term programming language usually refers to high-level languages, such as BASIC, C, C++, COBOL, Java, FORTRAN, Ada, and Pascal.

C is a procedural programming language. It was initially developed by Dennis Ritchie in the year 1972. It was mainly developed as a system programming language to write an operating system. The main features of C language include low-level access to memory, a simple set of keywords, and clean style, these features make C language suitable for system programming like an operating system or compiler development.

Many later languages have borrowed syntax/features directly or indirectly from C language. Like syntax of Java, PHP, JavaScript, and many other languages are mainly based on C language. C++ is nearly a superset of C language (There are few programs that may compile in C, but not in C++).

This book contains basic programs of C language to give new learners a easy way to develop their knowledge about C programming without learning theoretical part o C. Also user can do practise on Offline or Online mode by doing following programs.

-Mrs. AYUSHI SHUKLA

ACKNOWLEDGEMENT

BASIC PROGRAM BOOK FOR

"C LEARNING"

CONTENT

A} BASIC STRUCTURE OF C: - Every fundamental capacity contains 2 sections. An announcement part and an Execution part. The revelation part is where all the factors are announced. The execution part starts with the wavy sections and finishes with the wavy close section.

Declaration Part: -   Documentation, Link, Definition, Global Declarations
Execution part: -   Main functions, Subprograms

Documentation Section
Link Section
Definition Section
Global Declarations Section

DECLARATION PART

EXECUTION PART

Main Functions Section
Subprogram Section
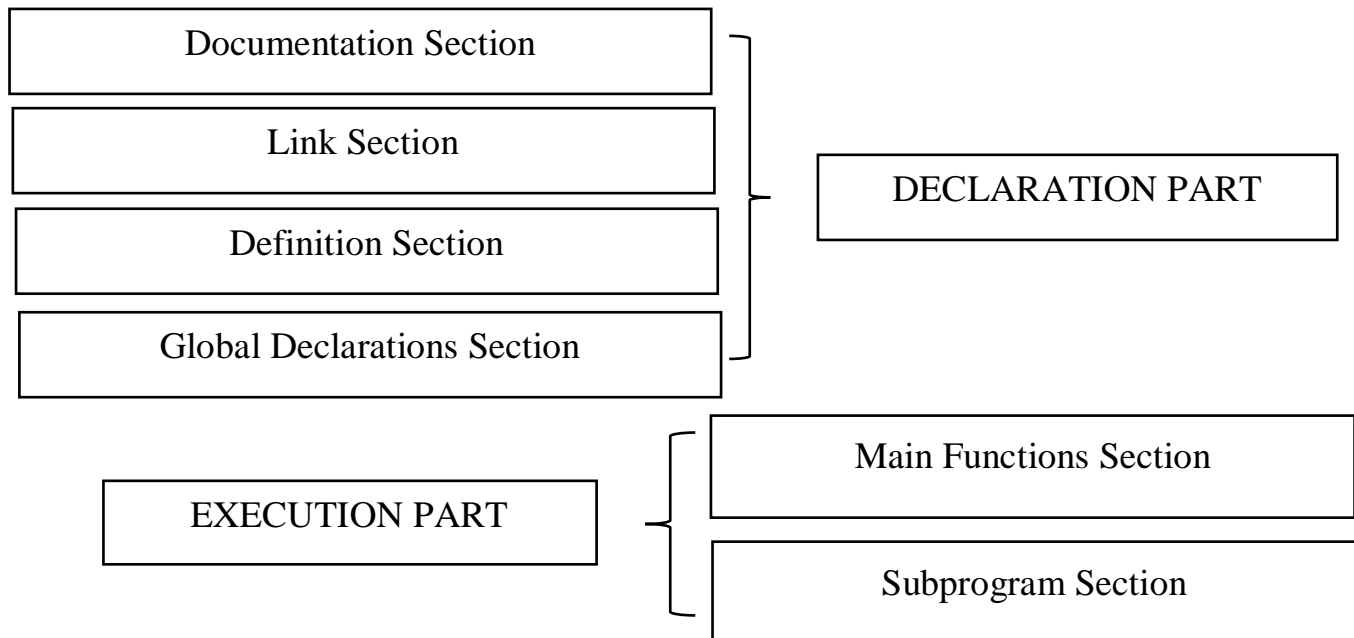
A1} DECLARATION PART

- **Documentation Section: -**

The documentation segment is the piece of the program where the developer gives the subtleties related with the program. Generally, gives the name of the program, the subtleties of the creator and different subtleties like the hour of coding and depiction. It gives anybody perusing the code the outline of the code.

- **Link Section: -**

This piece of the code is utilized to pronounce all the header records that will be utilized in the program. This prompts the compiler being advised to interface the header documents to the framework libraries.

- **Definition Section: -**

In this segment, we characterize various constants. The watchword characterize is utilized in this part.

- **Global Declarations: -**

This piece of the code is where the worldwide factors are proclaimed. All the worldwide variable utilized are announced in this part. The client characterized capacities are additionally announced in this piece of the code.

A2} EXECUTION PART

- **Main functions: -**

Each C-programs needs to have the primary capacity. Every fundamental capacity contains 2 sections. A revelation part and an Execution part. The statement part is where all the factors are proclaimed. The execution part starts with the wavy sections and finishes with the wavy close section. Both the assertion and execution part are inside the wavy supports.

- **Subprograms: -**

All the client characterized capacities are characterized in this segment of the program.

A3} STRUCTURE INCLUDES: -

1. **# include <stdio.h>**
   This order is a pre-processor mandate in C that incorporates all standard info yield documents prior to arranging any C program to utilize every one of those capacities in our C program.
2. **int main()**
   This is the line from where the execution of the program begins. The primary() work begins the execution of any C program.
3. **{(Opening Curly bracket)**
   This demonstrates the start of any capacity in the program (Here it shows the start of the primary capacity).
4. **/* some comments */**
   Whatever is inside/*— — - */are not aggregated and executed; they are just composed for client understanding or for making the program intuitive by embeddings a remark line. These are known as multiline remarks.
5. **printf("Hello World")**
   The printf() order is remembered for the C stdio.h library, which assists with showing the message on the yield screen.
6. **getch()**
   This order assists with holding the screen.
7. **return 0**
   This order ends the C program and returns an invalid worth, that is, 0.
8. **} (Closing Curly brackets)**
   This shows the finish of the capacity. (Here it shows the finish of the principle work)

Example Program: -
/*Basic starting program structure */ (Used for comments not compiled)
1. #include <stdio.h>   /* **Header File**/
2. int main()   /***Main Function**/
3. {   /* **Opening Curly Bracket** */
4.   printf("Hello World");   /* **Opening Curly Bracket** */
5.   return 0;   /***Return function**/
6. }   /* **Closing Curly Bracket** */

How does this program work?

- All valid C programs must contain the **main()** function. The code execution begins from the start of the **main()** function.
- The **printf()** is a library function to send formatted output to the screen. The function prints the string inside quotations.
- To use **printf()** in our program, we need to include stdio.h header file using the **#include <stdio.h>** statement.
- The **return0;** statement inside the **main()** function is the "Exit status" of the program. It's optional.

START WITH PROGRAMS IN "C"

PROGRAM- 1

Q. Write a program to print a message on the output screen.
PROGRAM :-

1. #include<stdio.h>
2. #include<conio.h>
3. int main()
4. {
5. clrscr();
6. printf("HELLO WORLD");
7. getch();
8. return 0;
9. }

OUTPUT:-

```
HELLO WORLD
```

PROGRAM- 2

Q. Write a program for the addition of two numbers.

PROGRAM:-

1. #include<stdio.h>
2. #include<conio.h>
3. int main()
4. {
5. clrscr();
6. int a ,b ,c;
7. printf("Enter the value of a and b for addition:\n");
   *** \n is used for entering in next line ***
8. scanf("%d%d",&a, &b);
9. c = a+b;
10. printf("Sum of a and b is %d", c);
11. getch();
12. return 0;
13. }

OUTPUT:-

```
Enter the value of a and b for addition:
2
2
Sum of a and b is 4
```

PROGRAM- 3

Q. Write a program for the subtraction of two numbers.
PROGRAM:-
1. #include<stdio.h>
2. #inlcude<conio.h>
3. int main()
4. {
5. clrscr();
6. int a,b,c;
7. printf("Enter the value of a and b for subtraction:\n");
8. scanf("%d%d",&a,&b);
9. c=a-b;
10. printf("Subtraction of a and b is %d", c);
11. getch();
12. return 0;
13. }
OUTPUT:-

```
Enter the value of a and b for subtraction:
5
2
Subtraction of a and b is 3
```

PROGRAM- 4

Q. Write a program for multiplication of two numbers.
PROGRAM:-

```
1.  #include<stdio.h>
2.  #include<conio.h>
3.  int main()
4.  {
5.  clrscr();
6.  int a,b,c;
7.  printf("Enter the value of a and b for multiplication:\n");
8.  scanf("%d%d",&a,&b);
9.  c=a*b;
10. printf("Multiplication of a and b is %d",c);
11. getch();
12. return 0;
13. }
```

OUTPUT:-

```
Enter the value of a and b for multiplication :
2
3
Multiplication of a and b is  6
```

PROGRAM- 5

Q. Write a program for division of two numbers.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. clrscr( );
6. int a,b,c;
7. printf("Enter the value of a and b for division:\n");
8. scanf("%d%d",&a,&b);
9. c=a/b;
10. printf("Division of a and b is %d", c);
11. getch();
12. return 0;
13. }
OUTPUT:-

```
Enter the value of a and b for division:
12
2
Division of a and b is 6
```

PROGRAM- 6

Q. Write a program to find the area of rectangle.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main()
4. {
5. clrscr( );
6. int l,b,area;
7. printf("Enter the value of l and b:\n");
8. scanf("%d%d ",&l,&b);
9. area=l*b;
10. printf("Area of rectangle is %d ",area);
11. getch( );
12. return 0;
13. }
OUTPUT:-

```
Enter the value of l and b:
5
2
Area of rectangle is 10
```
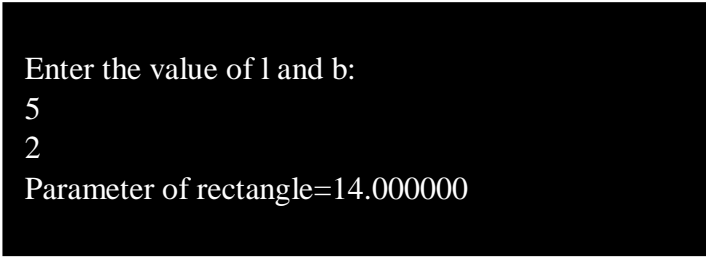
PROGRAM- 7

Q. Write a program to find parameter of rectangle.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. clrscr( );
6. float l,b,parameter;
7. printf("Enter the value of l and b:\n");
8. scanf("%f%f",&l,&b);
9. parameter=2(l+b);
10. printf("Parameter of rectangle=%f",parameter);
11. getch( );
12. return 0;
13. }
OUTPUT:-

```
Enter the value of l and b:
5
2
Parameter of rectangle=14.000000
```

PROGRAM- 8

Q. Write a program to find area of square.

PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. void main( ) ***void main( ) is also a main functionas just like int main( ) function***
4. {
5. clrscr( );
6. int a, A;
7. printf("Enter the value of a:");
8. scanf("%d",&a);
9. A=a*a;
10. printf("Area of square= %d",A);
11. getch( );
12. }

NOTE:-In "void main( )" function , there is no need of "return 0" because void main( ) is already a return-type function in its own.

OUTPUT:-

```
Enter the value of a:2
Area of square=4
```
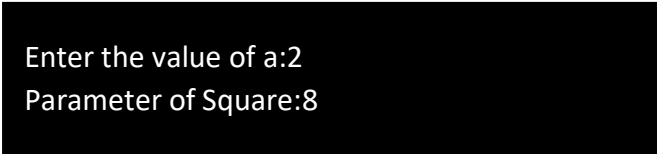
PROGRAM- 9

Q. Write a program to find parameter of square.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main()
4. {
5. clrscr();
6. int a, p;
7. printf("Enter the value of a:");
8. scanf("%d",&a);
9. p=4*a;
10. printf("Parameter of Square:%d",p);
11. getch( );
12. return 0;
13. }
OUTPUT:-

```
Enter the value of a:2
Parameter of Square:8
```

PROGRAM- 10

Q. Write a program to find the radius of circle.

PROGRAM:-

1. #include<stdio.h>
2. #include<conio.h>
3. void main( )
4. {
5. clrscr( );
6. float r, d;
7. printf("Enter the valude of diameter of circle:");
8. scanf("%f",&r);
9. r=d/2;
10. printf("Radius of Circle is %f",r);
11. getch( );
12. }

OUTPUT:-

```
Enter the value of  diameter of circle:6
Radius of Circle is 3.000000
```
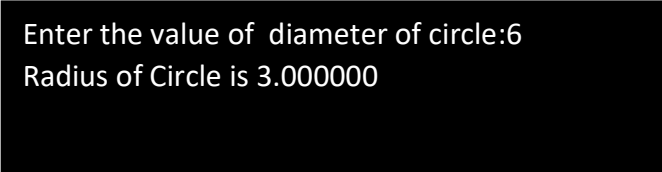
PROGRAM- 11

Q. Write a program to find the area of circle.

PROGRAM:-

1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. clrscr( );
6. float a, r;
7. printf("Enter the value of radius of circle:");
8. scanf("%f",&r);
9. a=3.14*r*r;
10. printf("The Area of Circle is %f'',a);
11. getch( );
12. return 0;
13. }

OUTPUT:-

```
Enter the value of radius of circle:3
The Area of Circle:28.260000
```
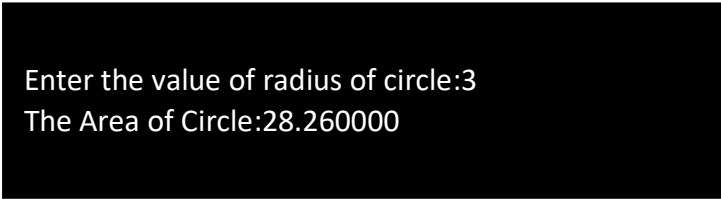
PROGRAM- 12

Q. Write a program to find area of rhombus.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. clrscr( );
6. int a, b, area;
7. printf("Enter the value of length(b),altitude(height, a));
8. scanf("%d%d",&b,&a);
9. area=b*a;
10. printf("The Area of Rhombus:%d",area);
11. getch( );
12. return 0;
13. }

OUTPUT:-

```
Enter the value of length(b),altitude(height, a):5
5
The Area of Rhombus:25
```

PROGRAM- 13

Q. Write a program to calculate simple interest.

PROGRAM:-

1. #include<stdio.h>
2. #include<conio.h>
3. void main( )
4. {
5. clrscr( );
6. int p, r, t, si;
7. printf("Enter the value of Principal, Interest rate, Time(Year):");
8. scanf("%d%d%d",&p,&r,&t);
9. si=(p*r*t)/100;
10. printf("Simple Interest is %d",si);
11. getch ( );
12. }

OUTPUT:-

```
Enter the value of Principal, Interest rate,
Time(Year):5000
3
1
Simple Interest is 150
```

PROGRAM- 14

Q. Write a program using pow function(pow( )) to calculate compound interest.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. #include<math.h>***Here we use "math.h" header file because without this header file pow( )or any mathematical( )can't work*\
4. void main( )
5. {
6. clrscr( );
7. int p,r,t,n,ci;
8. printf("Enter the value of principal,interest rate,time(year),number of times interest applied per time period:");
9. scanf("%d%d%d%d",&p,&r,&t,&n);
10. ci=p*pow((1+r/n),n*t);
11. printf("Compound Interest is %d",ci);
12. getch( );
13. }

OUTPUT:-

```
Enter the value of principal,interest
rate,time(year),number of times interest applied per
time period:5000
3
1
2
Compound Interest is 20000
```

PROGRAM- 15

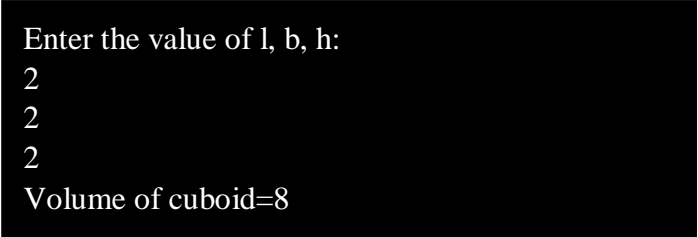**Q.** Write a program to calculate the volume of cuboid.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. clrscr();
6. int l,b,h, volume;
7. printf("Enter the value of l, b, h:\n");
8. scanf("%d%d%d",&l,&b,&h);
9. volume=l*b*h;
10. printf("Volume of cuboid=%d",volume);
11. getch( );
12. return 0;
13. }

OUTPUT:-

```
Enter the value of l, b, h:
2
2
2
Volume of cuboid=8
```

PROGRAM- 16

Q.Write a program to print "x is less than y" if x=20, y=22 using if-conditional statement.

PROGRAM:-

1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. clrscr( );
6. int x=20;
7. int y=22;
8. if (x<y)
9. {
10. printf("x is less than y.");
11. }
12. getch( );
13. return 0;
14. }

OUTPUT:-

```
x is less than y.
```

PROGRAM- 17

Q. Write a program to compare two numbers.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. clrscr( );
6. int x;
7. int y;
8. printf("Enter the value of x, y:\n);
9. scanf("%d%d", &x, &y);
10. if (x>y)
11. {
12. printf("x is greater than y");
13. }
14. if (x<y)
15. {
16. printf("y is greater than x");
17. }
18. if (x==y)
19. {
20. printf("x is equal to y");
21. }
22. getch( );
23. return 0;
24. }
OUTPUT:-

```
Enter the value of x, y:
10
14
y is greater than x
```

PROGRAM- 18

Q. Write a program to compare variable with 100 and print "Condition is true" if it is true otherwise print "Condition is false".

PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. void main( )
4. {
5. clrscr( );
6. int a=20;
7. if (a<100)
8. {
9. printf("Condition is true");
10. }
11. else
12. {
13. printf("Condition is false");
14. }
15. getch( );
16. }

OUTPUT:-

```
Condition is true
```

Q. Write a program to compare two variables whose values are 80, 40 using if-else statement.
PROGRAM:-

```
1.  #include<stdio.h>
2.  #include<conio.h>
3.  int main
4.  {
5.  clrscr( );
6.  int y=80;
7.  int z=40;
8.  if (y>z)
9.  {
10. printf("Hello");
11. }
12. else
13. {
14. printf("Bye");
15. getch( );
16. return 0;
17. }
```

OUTPUT:-

```
Hello
```

Q. Write a program to compare two variables from which one variable has value 50.

PROGRAM:-

```
1.  #include<stdio.h>
2.  #include<conio.h>
3.  void main( )
4.  {
5.  clrscr( );
6.  int x=50;
7.  int y;
8.  printf("enter the value of y:\n");
9.  scanf("%d", &y);
10. if (x>y)
11. {
12. printf("x is greater than y");
13. }
14. if (x<y)
15. {
16. printf("x is less than y");
17. }
18. if (x==y)
19. {
20. printf("x is equal to y");
21. }
22. getch( );
23. }
```

OUTPUT:-

```
enter the value of y:
56
x is less than y
```

PROGRAM- 21

Q. Write a program to compare two variables using if conditional statement.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. void main( );
4. {
5. clrscr( );
6. float x, y;
7. printf("enter the value of x:");
8. scanf("%f", &x);
9. printf("enter the value of y:");
10. scanf("%f", &y);
11. if (x>y)
12. {
13. printf("x is greater");
14. }
15. if (x<y)
16. {
17. printf("y is greater");
18. }
19. if (x==y)
20. {
21. printf("both are equal");
22. }
23. getch( );
24. }
OUTPUT:-

```
enter the value of x:20
enter the value of y:20
both are equal
```

PROGRAM- 22

Q. Write a program for vowel checking by using "OR operator" with nested-if conditional statement.

PROGRAM:-

```
1.  #include<stdio.h>
2.  #include<conio.h>
3.  Int main( )
4.  {
5.  Clrscr( );
6.  Char choice;
7.  Printf("Enter your choice:");
8.  Scanf("%c", &choice);
9.  If (choice=='A'||choice=='a')
10. {
11. Printf("It is Vowel");
12. }
13. If (choice=='E'||choice=='e')
14. {
15. Printf("It is Vowel");
16. }
17. If (choice=='I'||choice=='i')
18. {
19. Printf("It is Vowel");
20. }
21. If (choice=='O'||choice=='o')
22. {
23. Printf("It is Vowel");
24. }
25. If (choice=='U'||choice=='u')
26. {
27. Printf("It is Vowel");
28. }
29. Else
30. {
31. Printf("It is Consonant");
32. }
33. Getch( );
34. Return 0;
35. }
```

OUTPUT:-

```
Enter your choice: A
It is Vowel
```
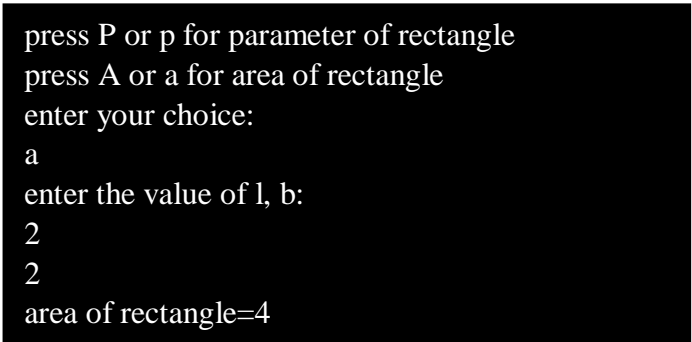
PROGRAM- 23

Q. Write a program to find area of rectangle when user press a, if user press p to find parameter of rectangle with both case letters.

PROGRAM:-

1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. int l, b, pr, ar;
6. char choice;
7. printf("press P or p for parameter of rectangle\n);
8. printf("press A or a for area of rectangle");
9. printf("enter your choice:\n");
10. scanf("%c", &choice);
11. if (choice=='p'||choice=='p')
12. {
13. printf("enter the value of l, b:\n");
14. scanf("%d%d", &l, &b);
15. pr=2*(l+b);
16. printf("parameter of rectangle=%d", pr);
17. }
18. else if (choice=='a'||choice=='a')
19. {
20. printf("enter the value of l, b:\n");
21. scanf("%d%d", &l, &b);
22. ar=l*b;
23. printf("area of rectangle=%d", ar);
24. }
25. else
26. {
27. printf("your choice is wrong");
28. }
29. getch( );
30. return 0;
31. }

OUTPUT:-

```
press P or p for parameter of rectangle
press A or a for area of rectangle
enter your choice:
a
enter the value of l, b:
2
2
area of rectangle=4
```

PROGRAM- 24

Q. Write a program to print 1 to 10 numbers using for loop.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. void main( )
4. {
5. clrscr( );
6. int i;
7. for(i=1;i<=9;i++)
8. {
9. printf("%d\n",i);
10. }
11. getch( );
12. }

OUTPUT:-

```
1
2
3
4
5
6
7
8
9
10
```

PROGRAM- 25

Q. Write a program to print 1 to 10 numbers using while loop.

PROGRAM:-

1. #include<stdio.h>
2. #include<conio.h>
3. void main( )
4. {
5. clrscr( );
6. int i=1;
7. while(i<=9)
8. {
9. printf("%d",i);
10. i++;
11. }
12. getch( );
13. }

OUTPUT:-

```
12345678910
```

PROGRAM- 26

Q. Write a program to print A to Z alphabets using for loop.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. void main( )
4. {
5. clrscr( );
6. {
7. int i=65; *65 to 90 are the ASCII Code for 'A' to 'Z'*\
8. for(i=65;i<=90;i++)
9. {
10. printf("%c\n",i); *here we take '%c' because to print 'A' to 'Z'*\
11. }
12. getch( );
13. }
OUTPUT:-

```
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
```

PROGRAM- 27

Q. Write a program that takes input of three angles of a triangle three times and check whether that triangle is valid or not, if its valid then prints "triangle is valid", otherwise "triangle is invalid".

PROGRAM:-

```
1.  #include<stdio.h>
2.  #include<conio.h>
3.  void main( )
4.  {
5.  clrscr( );
6.  int i, a, b, c, sum;
7.  for(i=1;i<=2;i++)
8.  {
9.  printf("\nEnter the value of a, b, c:");
10. scanf("%d%d%d",&a, &b,&c);
11. sum=a+b+c;
12. printf("Sum of a, b, c=%d",sum);
13. if(sum==180)
14. {
15. printf("Triangle is valid");
16. }
17. else
18. {
19. printf("Triangle is invalid");
20. }
21. }
22. getch( );
23. }
```

OUTPUT:-

```
Enter the value of a, b, c:20
80
80
Sum of a, b, c=180
Triangle is valid
Enter the value of a, b, c:50
50
40
Sum of a, b, c=140
Triangle is invalid
Enter the value a, b, c:40
40
30
Sum of a, b, c=110
Triangle is invalid
```

PROGRAM- 28

Q. Write a program using do-while to print 1 to 10 numbers in decrement order use '\n' for each and every numbers.

PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main( )
4. {
5. clrscr( );
6. int i=10;
7. do
8. {
9. printf("%d\n",i);
10. i--;
11. }
12. while(i>=1)
13. getch( );
14. return 0;
15. }

OUTPUT:-

```
10
9
8
7
6
5
4
3
2
1
```

PROGRAM- 29

Q. Write a program for swapping two values.
PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. int main( );
4. {
5. clrscr( );
6. int first, second, temporary;
7. printf("Enter the first number:");
8. scanf("%d", &first);
9. printf("Enter the second number:");
10. scanf("%d", &second);
11. temporary=first; ***value of first is assigned to temporary***\
12. first=second; ***value of second is assigned to first***\
13. second=temporary; ***value of temporary(initial value of first)is assigned to second***\
14. printf("\nAfter swapping first number=%d\n", first);
15. printf("After swapping second number=%d", second);
16. getch( );
17. return 0;
18. }
OUTPUT:-

```
Enter the first number:2
Enter the second number:5
After swapping first number=5
After swapping second number=2
```

PROGRAM- 30

Q. Write a program that takes input of marks of 5 different subject and calculate percentage if
1) percentage is greater or equal to 75 so, output should be 'Honors',
2)percentage is less than 75 so, output should be pass with '1st division',
3)percentage is less than 35 so, output should be 'fail'.

PROGRAM:-
1. #include<stdio.h>
2. #include<conio.h>
3. void main|( );
4. {
5. clrscr( );
6. float percentage, m1, m2, m3, m4, m5;
7. printf("Enter the marks of m1, m2, m3, m4, m5:");
8. scanf("%f%f%f%f%f", &m1, &m2, &m3, &m4, &m5);
9. percentage=(m1+m2+m3+m4+m5)/5;
10. printf("Percentage=%d\n", percentage);
11. if("percentage>=75)
12. {
13. printf("Honors");
14. }
15. if(percentage<75)
16. {
17. printf("1st division");
18. }
19. if(percentage<35)
20. {
21. printf("Fail");
22. }
23. getch( );
24. }

OUTPUT:-

```
Enter the marks of m1, m2, m3, m4, m5:50
55
60
45
65
Percentage=55.000000
1st division
```
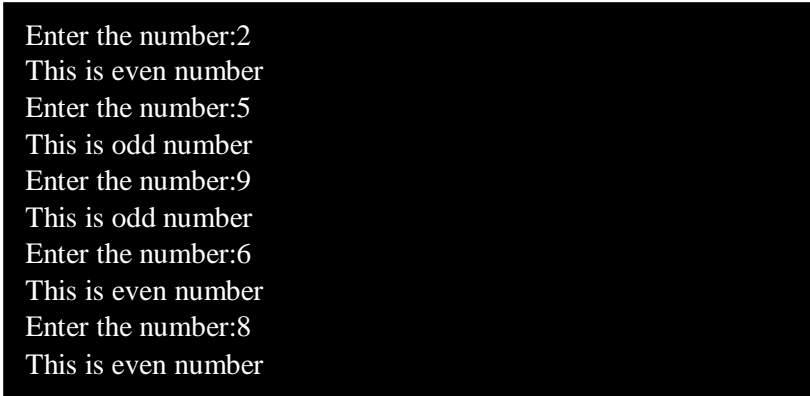
PROGRAM- 31

Q. Write a program to check whether given number is odd or even, if user gives five times input.

PROGRAM:-

1. #include<stdio.h>
2. #incluude<conio.h>
3. int main( )
4. {
5. clrscr( );
6. int i, n;
7. for(i=0; i<=5; i++)
8. {
9. printf("\nEnter the number:");
10. scanf("%d", &n);
11. if(n%2==0)
12. {
13. printf("This is even number");
14. }
15. else
16. {
17. printf("This is odd number");
18. }
19. }
20. getch( );
21. return 0;
22. }

OUTPUT:-

```
Enter the number:2
This is even number
Enter the number:5
This is odd number
Enter the number:9
This is odd number
Enter the number:6
This is even number
Enter the number:8
This is even number
```

Contact Us:

University Campus Address:

Jayoti Vidyapeeth Women's University

Vadaant Gyan Valley, Village-Jharna, Mahala Jobner Link Road,

Jaipur Ajmer Express Way, NH-8, Jaipur- 303122, Rajasthan (INDIA)

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