

# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.



## C PROGRAMMING LAB RECORD

*Submitted by*

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*Under the Guidance of*  
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*in partial fulfillment for the award of the degree of*  
**BACHELOR OF ENGINEERING**  
*in*  
**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**



**B.M.S. COLLEGE OF ENGINEERING**

(Autonomous Institution under VTU)

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**B.M.S. COLLEGE OF ENGINEERING**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



***DECLARATION***

I, SAI KRISHNA MANOJ ALAPATI, student of 2nd Semester, B.E, Department of AIML Engineering, B. M. S. College of Engineering, Bangalore, hereby declare that, this laboratory work for "C Programming" course has been carried out by us under the guidance of Prof. Rekha G S, Assistant Professor, Department of CSE, B. M. S. College of Engineering, Bangalore during the academic semester April-2021-June-2021

We also declare that to the best of our knowledge and belief, the development reported here is not from part of any other report by any other students.

SAI KRISHNA MANOJ ALAPATI (1BM20AI047)

**1) Develop a C program to convert degrees Fahrenheit into degrees celsius.**

```
#include<stdio.h>
#include<conio.h>
void main()
{
float fah,cel;
printf("Enter the temp in fahrenheit= ");
scanf("%f",&fah);
cel=(5.0/9)*(fah-32);
printf("%.2f fahreheit in celsius is %.2f C", fah, cel);
getch();
}
```

## OUTPUT:

```
enter the temp in fahrenheit32
\n the temp in celsius is : 0.000000
```

**2) Develop a C program to find the area of a triangle given its sides as input using functions.**

```
#include <stdio.h>
#include <math.h>
int areacalculate(int a,int b,int c)
{
float s , area , s1;
s1=a+b+c;
s = s1/2;
area = sqrt(s*(s-a)*(s-b)*(s-c));
printf("Area of Triangle of given sides is %0.2f",area);
return 0;
}
int main(){
int a1,b1,c1;
printf("Enter three side of triangle\n");
scanf("%d %d %d",&a1,&b1,&c1);
areacalculate(a1,b1,c1);
return 0;
}
```

## OUTPUT:

The screenshot displays the Code::Blocks IDE interface. A console window titled "C:\C language programs\area of traingle.exe" is open, showing the program's output. The program prompts the user to "enter the three sides" and then displays the calculated area as 36.000000. The console also shows the execution time as 3.533 s and a message to "Press any key to continue." The background shows the Code::Blocks editor with a file named "area of traingle.c" and a build log window at the bottom.

```
area of traingle.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help

C:\C language programs\area of traingle.exe
enter the three sides
the area is=36.000000
Process returned 21 (0x15)   execution time : 3.533 s
Press any key to continue.

File L... Message
=== Build file: "no target" in "no project" (compiler: unkn...
=== Build finished: 0 error(s), 0 warning(s) (0 minute(s), ...

C:\C language programs\area of traingle.c C/C++ Windows (CR+LF) WINDOWS-1252 Line 1, Col 1, Pos 0 Insert Read/Write default
Type here to search 28°C Partly cloudy ENG 9:59 AM 5/24/2021
```

3) Develop a C program to find all possible roots of a quadratic equation.

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

```
#include<math.h>
```

```
float func(int,int,int);
```

```
void main()
```

```
{
```

```
    float a,b,c,d,r1,r2;
```

```
    printf("enter the coefficients");
```

```
    scanf("%f %f %f",&a,&b,&c);
```

```
    func(a,b,c);
```

```
}
```

```
float func(int a,int b,int c)
```

```
{
```

```
    float d,r1,r2,realp,imgp;
```

```
    d=b*b-4*a*c;
```

```
    if(d>0)
```

```
    {
```

```
        r1=(-b+sqrt(d))/2*a;
```

```
        r2=(-b-sqrt(d))/2*a;
```

```
        printf("the roots are %f and %f",r1,r2);
```

```
    }
```

```
    else if(d==0)
```

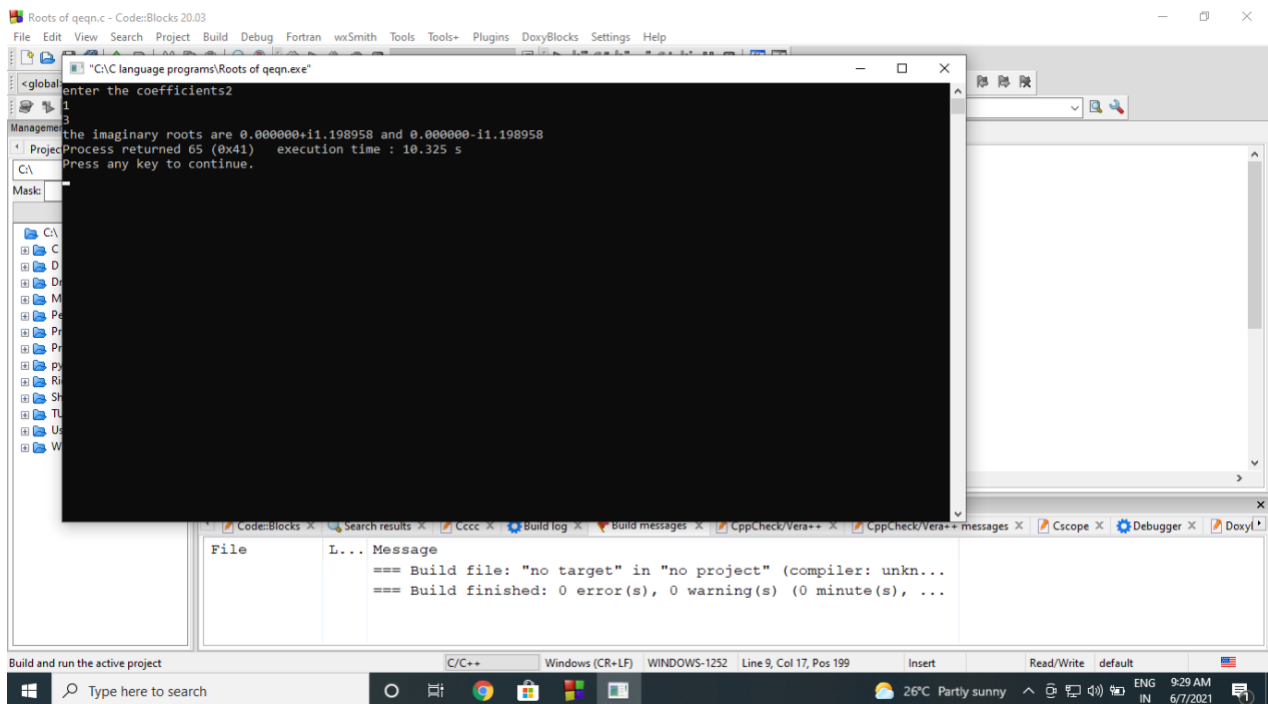
```
    {
```

```

    r1=r2=-b/(2*a);
    printf("the roots are %f and %f",r1,r2);
}
else
{
    realp=-b/(2*a);
    imgp=sqrt(-d)/(2*a);
    printf("the imaginary roots are %f+i%f and %f-
i%f",realp,imgp,realp,imgp);
}
return(0);
}

```

## OUTPUT:





**4)** Determine whether the entered character is a vowel or consonant using switch case statement.

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

```
void func(char);
```

```
void main()
```

```
{
```

```
    char c;
```

```
    printf("enter the character\n");
```

```
    scanf("%c",&c);
```

```
    func(c);
```

```
}
```

```
void func(char c)
```

```
{
```

```
    switch(c)
```

```
    {
```

```
        case 'a':
```

```
            printf("vowel");
```

```
            break;
```

```
        case 'e':
```

```
            printf("vowel");
```

```
            break;
```

```
        case 'i':
```

```
            printf("vowel");
```

```
            break;
```

```
        case 'o':
```

```
            printf("vowel");
```

```
            break;
```

```
        case 'u':
```

```
            printf("vowel");
```

```

break;

case 'A':

    printf("vowel");

    break;

case 'E':

    printf("vowel");

    break;

case 'I':

    printf("vowel");

    break;

case 'O':

    printf("vowel");

    break;

case 'U':

    printf("vowel");

    break;

default:

    printf("consonat");

}

```

**OUTPUT:**

The screenshot shows the Code::Blocks IDE with a C program being executed. The program prompts the user to 'enter the character'. The user has entered a character that is recognized as a vowel, resulting in the output 'vowel'. The console window displays the execution details, including the process return code (5) and the execution time (2.954 s). The IDE interface includes a menu bar, a toolbar, a file explorer, and a console window.

5) Develop a C program to print even numbers from M to N.

```
#include<stdio.h>

void func(int,int);

void main()
{
    int m,n;

    printf("from where?");

    scanf("%d",&m);

    printf("till where?");

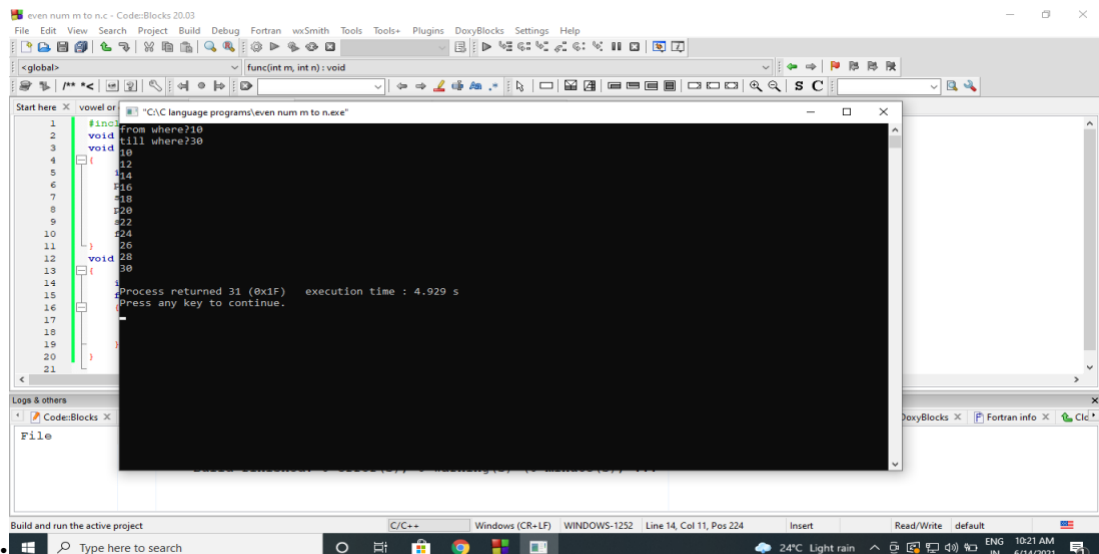
    scanf("%d",&n);

    func(m,n);
}

void func(int m,int n)
{
    int i;

    for(i=m;i<=n;i++)
    {
        if(i%2==0)

        printf("%d\n",i); }}
```



The screenshot shows the Code::Blocks IDE with a C program open. The program prompts the user for 'from where?' and 'till where?' and prints even numbers from 10 to 30. The output window shows the execution time and a message to press any key to continue.

OUTPUT: Type here to search

6) Develop a program to calculate the sum of squares of first n odd numbers.

```
#include<stdio.h>

void sum(int);

void main()
{
    int n,final;
    printf("till where?\n");
    scanf("%d",&n);
    sum(n);
}

void sum(int n)
{
    int i,s=0;
    for(i=0;i<=n-1;i++)
    {
        s=s+(2*i+1)*(2*i+1);
        printf("%d^2+",2*i+1);
    }
    printf("=%d",s);
}
```

## OUTPUT:

The screenshot shows the Code::Blocks IDE with a C program open. The program calculates the sum of squares of the first 3 odd numbers. The output window displays the result and execution time.

```
void sum
void main
{
    int 3
    print 1^2+3^2+5^2+=35
    scanProcess returned 3 (0x3)   execution time : 9.069 s
    sum(Press any key to continue.
}
// 200
}
void sum
{
    int
    for(
    {
    }
    }
    print
    }
}
```

Output:

```
1^2+3^2+5^2+=35
scanProcess returned 3 (0x3)   execution time : 9.069 s
sum(Press any key to continue.
```

## 7) Develop a program to perform addition of two Matrices.

```
#include<stdio.h>

void main()
{
    int a[10][10],b[10][10],c[10][10],i,j,r1,r2,c1,c2;

    printf("enter the number of rows in 1st matrix\n");
    scanf("%d",&r1);

    printf("enter no of columns in 1st matrix\n");
    scanf("%d",&c1);

    printf("no of rows in 2nd matrix\n");
    scanf("%d",&r2);

    printf("no of columns in 2nd matrix\n");
    scanf("%d",&c2);

    if(r1!=r2 || c1!=c2)
    {
        printf("invalid addition");
        exit(0);
    }
    else
    {
        printf("enter first matrix elements\n");
        for(i=0;i<r1;i++)
        {
            printf("\n");
            for(j=0;j<c1;j++)
            {
                scanf("%d",&a[i][j]);
            }
        }

        printf("enter second matrix elements\n");
        for(i=0;i<r2;i++)
        {
            printf("\n");
            for(j=0;j<c2;j++)
            {
                scanf("%d",&b[i][j]);
            }
        }
    }
}
```

```

    }
}

for(i=0;i<r1;i++)
{
    for(j=0;j<c1;j++)
    {
        c[i][j]=a[i][j]+b[i][j];
    }
}

printf("final matrix is\n");
for(i=0;i<r1;i++)
{
    printf("\n");
    for(j=0;j<c1;j++)
    {
        printf("%d",c[i][j]);
        printf("\t");
    }
}
}
}
}

```

## OUTPUT:

```

addition of two matrices.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
<global> "C:\C language programs\addition of two matrices.exe"
addition of two
1 1
2 2
3 3
4 4
5 5
6 6
7 7
8 8
9 9
enter second matrix elements
10 1
11 2
12 3
13 4
14 5
15 6
16 7
17 8
18 9
19 1
20 2
21 3
22 final matrix is
23 2 4 6
24 8 10 12
25 14 16 18
Process returned 3 (0x3) execution time : 14.597 s
Code::Blocks
File L... Message
=== Build file: "no target" in "no project" (compiler: unkn...
C:\C lan... In function 'main':
C:\C lan... 16 warning: implicit declaration of function 'exit' [-Wimplici...
C:\C lan... 16 warning: incompatible implicit declaration of built-in func...
Build and run the active project C/C++ Windows (CR+LF) WINDOWS-1252 Line 35, Col 34, Pos 851 Insert Read/Write default ENG 10:47 AM 6/28/2021
Type here to search 24°C Light rain

```

8) Develop a C program to copy one string to another string and find its length without using built in functions

```
#include<stdio.h>

void main()
{
    char str1[20],str2[20];
    int i,len=0;
    printf("enter the string\n");
    scanf("%s",str1);
    for(i=0;str1[i]!='\0';i++)
    {
        str2[i]=str1[i];
        len=i;
    }
    str2[i]='\0';
    printf("the copied string is %s\n",str2);
    printf("the length of string is=%d\n",len+1);
}
```



## OUTPUT:

The screenshot displays the Code::Blocks IDE interface. The main window shows the execution output of a C program. The program prompts the user to enter a string, which is 'manoj'. It then displays the copied string and its length (5). The execution time is 2.050 s. The status bar at the bottom indicates the active project is 'Build and run the active project' and the current file is 'C/C++'.

```
copy one string to another and length.c - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Plugins DoxyBlocks Settings Help
C:\C language programs\copy one string to another and length.exe
Enter the string
manoj
the copied string is manoj
the length of string is=5
Process returned 26 (0x1A)   execution time : 2.050 s
Press any key to continue.
```

Logs & others

File	Message
	=== Build file: "no target" in "no project" (compiler: unkn...
	=== Build finished: 0 error(s), 0 warning(s) (0 minute(s), ...

Build and run the active project C/C++ Windows (CR+LF) WINDOWS-1252 Line 10, Col 25, Pos 203 Insert Read/Write default

**9)** .Develop a C program to create student structure, read two student details( Student roll number, name, section, department, fees, and results i.e., total marks obtained) and print the student details who has scored the highest.

```
#include<stdio.h>

void main()
{
    struct student
    {
        int rollno;
        char name[20];
        char sec[3];
        char dept[20];
        int totalmarks;
    }student1,student2;

    printf("enter the roll number of student 1 and student 2\n");
    scanf("%d%d",&student1.rollno,&student2.rollno);
    printf("enter the name of student 1 and student 2\n");
    scanf("%s%s",student1.name,student2.name);
    printf("enter section of student 1 and student 2\n");
    scanf("%s%s",student1.sec,student2.sec);
    printf("enter the department of student 1 and student 2\n");
    scanf("%s%s",student1.dept,student2.dept);
    printf("enter the total marks of student 1 and student 2\n");
    scanf("%d%d",&student1.totalmarks,&student2.totalmarks);
    printf("STUDENT 1 DETAILS=\n");
    printf("roll no=%d\n",student1.rollno);
    printf("name=%s\n",student1.name);
    printf("section=%s\n",student1.sec);
    printf("department=%s\n",student1.dept);
    printf("total marks=%d\n",student1.totalmarks);
    printf("STUDENT 2 DETAILS=\n");
    printf("roll no=%d\n",student2.rollno);
```

```
printf("name=%s\n",student2.name);
printf("section=%s\n",student2.sec);
printf("department=%s\n",student2.dept);
printf("total marks=%d\n",student2.totalmarks);
if(student1.totalmarks>student2.totalmarks)
{
    printf("student 1 got highest marks\n");
}
else
{
    printf("student 2 got highest marks\n");
}
}
```

## OUTPUT:

The screenshot shows a C++ IDE with a file named 'structures 2 students.c'. The code is being executed, and the output is displayed in a console window. The program prompts the user to enter the roll number, name, section, department, and total marks for two students. The input for Student 1 is roll no=23, name=manoj, section=a, department=ai, and total marks=300. The input for Student 2 is roll no=34, name=pradeep, section=b, department=ece, and total marks=310. The program then displays the details for both students and concludes that Student 2 has the highest marks.

```
21 Enter the roll number of student 1 and student 2
22 23
23 34
24 Enter the name of student 1 and student 2
25 manoj
26 pradeep
27 Enter section of student 1 and student 2
28 a
29 b
30 Enter the department of student 1 and student 2
31 ai
32 ece
33 Enter the total marks of student 1 and student 2
34 300
35 310
36 STUDENT 1 DETAILS=
37 roll no=23
38 name=manoj
39 section=a
40 department=ai
41 total marks=300
42 STUDENT 2 DETAILS=
43 roll no=34
44 name=pradeep
45 section=b
46 department=ece
47 total marks=310
48 student 2 got highest marks
```

Process returned 0 (0x0) execution time : 24.839 s

=== Build file: "no target" in "no project" (compiler: unkn...  
=== Build finished: 0 error(s), 0 warning(s) (0 minute(s), ...

**10)** Develop a C program to perform arithmetic operations (addition, subtraction, multiplication, division and remainder) on two integers using pointers.

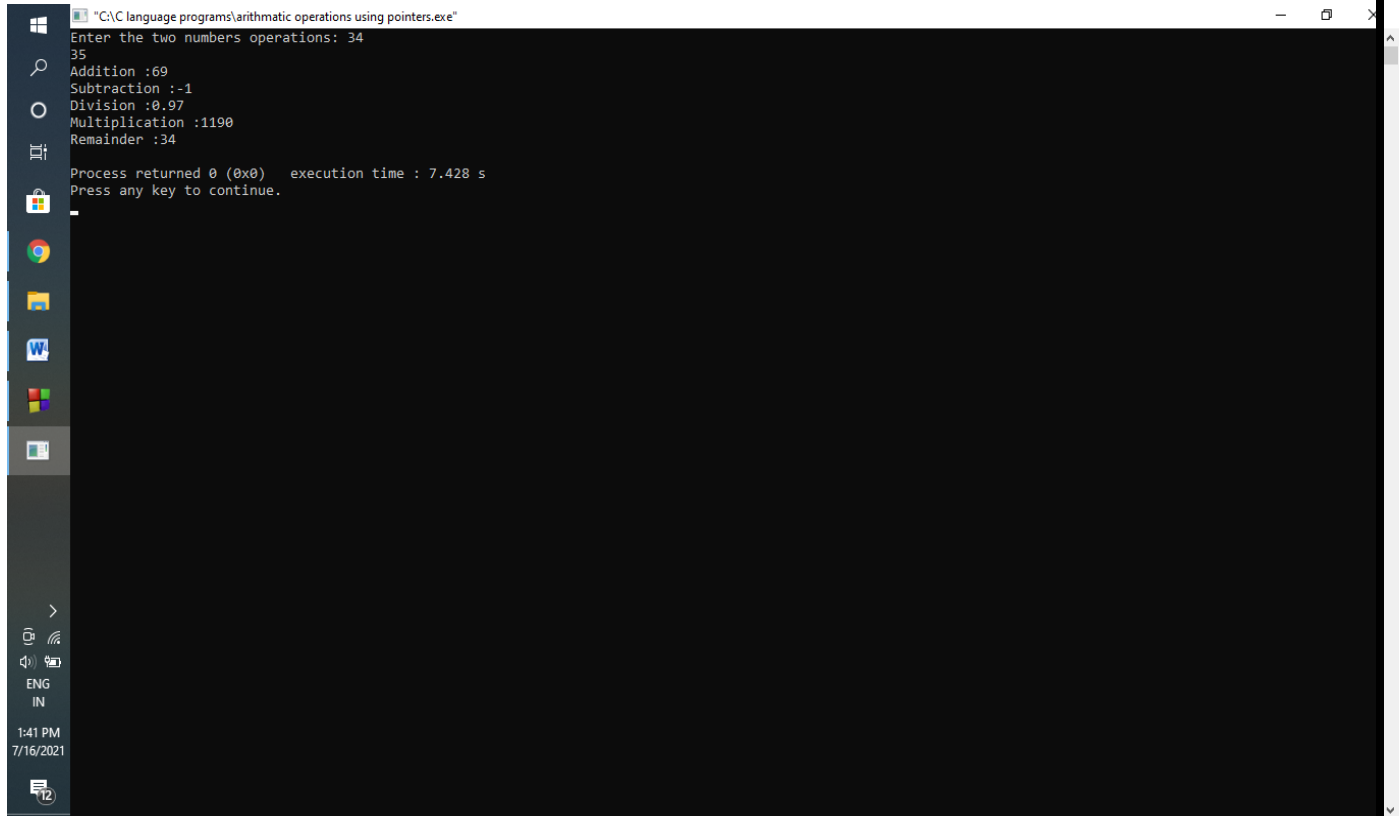
```
#include<stdio.h>

int operations(int *, int *, int *, int *, int*, float
*, int *);

int main()
{
    int a,b;
    int add,sub,multiplication,rem;
    float division;
    printf("Enter the two numbers operations: ");
    scanf("%d %d",&a,&b);
    operations(&a, &b, &add, &sub, &multiplication,&division, &rem);
    printf("Addition :%d\n",add);
    printf("Subtraction :%d\n",sub);
    printf("Division :%0.2f\n",division);
    printf("Multiplication :%d\n",multiplication);
    printf("Remainder :%d\n",rem);
    return 0;
}

int operations(int *a, int *b, int *add, int *sub, int
*multiplication, float *division, int *rem)
{
    *add=*a+*b;
    *sub=*a-*b;
    *multiplication=*a**b;
    *division=(float)(*a)/(*b);
    *rem=(*a)%(*b);
    return 0;
}
```

## OUTPUT:



```
"C:\C language programs\arithmetic operations using pointers.exe"
Enter the two numbers operations: 34
35
Addition :69
Subtraction :-1
Division :0.97
Multiplication :1190
Remainder :34

Process returned 0 (0x0)   execution time : 7.428 s
Press any key to continue.
```

**All 10 programs to be included:**

**Program Name**

**Program complete code**

**Program output screenshot**

**Each program should start on a fresh page**