EXPERIMENT NUMBER – 3.1

STUDENT’S NAME –	NIKHIL
STUDENT’S UID –	20BET1042
CLASS AND GROUP –	BE IT
SEMESTER –	1ST

TOPIC OF EXPERIMENT –

Practical 3.1:
In a class of n students the boys to girls ratio is p:q. Find no. boys and girls in the class and print :
1) If boys are more than or equal to 70% in the class then print gender partiality in education
2) If difference of boys are girls is diff and in range -5<=diff<=5 then print equal opportunities of education for both
3) If girls are more than or equal to 70% then print girls dominating in education.
4) For all others cases print no conclusion drawn

AIM OF THE EXPERIMENT –

– LEARN HOW TO APPLY DECISION MAKING STATEMENTS SUCH AS IF-ELSE, NESTED IF-ELSE, SWITCH STATEMENTS WHILE DEVELOPING MENU DRIVEN PROGRAMS FOR USERS.
PREREQUISITES- BASIC KNOWLEDGE OF WORKING OF OPERATORS, KNOWLEDGE OF DECISION STATEMENT.

PROGRAM CODE

```
#include <stdio.h>
int main()
{
int n, p, q, boys,boyspercentage,girls,girlspercentage,diff;
printf("Enter the total number of students in the class\n");
scanf("%d",&n);
printf("Enter the ratio of boys to girls in the class\n");
scanf("%d %d",&p,&q);
boys = n * p / (p+q);
girls = n - boys;
boyspercentage = (boys *100/n);
girlspercentage = (girls *100/n);
diff = boys - girls;
printf("\nNumber of boys in the class= %d\nNumber of girls in the class= %d\n",boys,girls);
printf("\nPercentage of boys in the class= %d\nPercentage of girls in the class=
%d\n",boyspercentage,girlspercentage);
printf("\nDifference between girls and boys in the class is %d\n",diff);
if (diff >= -5 && diff <=5)
printf("Equal Oppotunities of education are there for both boys and
girls\n"); else if (boyspercentage >= 70)
printf("Girls are dominating in education as girls percentage is %d\n",girlspercentage);
else
printf("There is no conclusion drawn from the given
stats\n"); return 0;
}
```

ERRORS ENCOUNTERED DURING PROGRAM’S EXECUTION

No

PROGRAMS’ EXPLANATION (in brief)

Observing this program first thing come in our mind how these formula form. Using help of my teacher I am unable to explain this.

first we will enter total no. of students and ratio of boys and girls now we know ratio is p:q

so we can say x(p+q)=n or x=n/(p+q)where x is just factor by which ratio devide and

multiply p by x we get no. of boys and q by x no. of girls so in above formula multiply p and q both sides respectively we will get no. of boys and girls where p*x is no. of boys and q*x is no. of girls in class.Thats how below formulas form now after getting no. of boys and girls then using basic maths formula we will get their percentage and difference bw them.

Number of boys in the class

n_boys=n * p / (p+q)

Number of girls in the class

n_girls= n- n_boys

Percentage of boys in the class

n_boys*100/n

Percentage of girls in the class

n_girls*100/n

Difference between girls and boys in the class

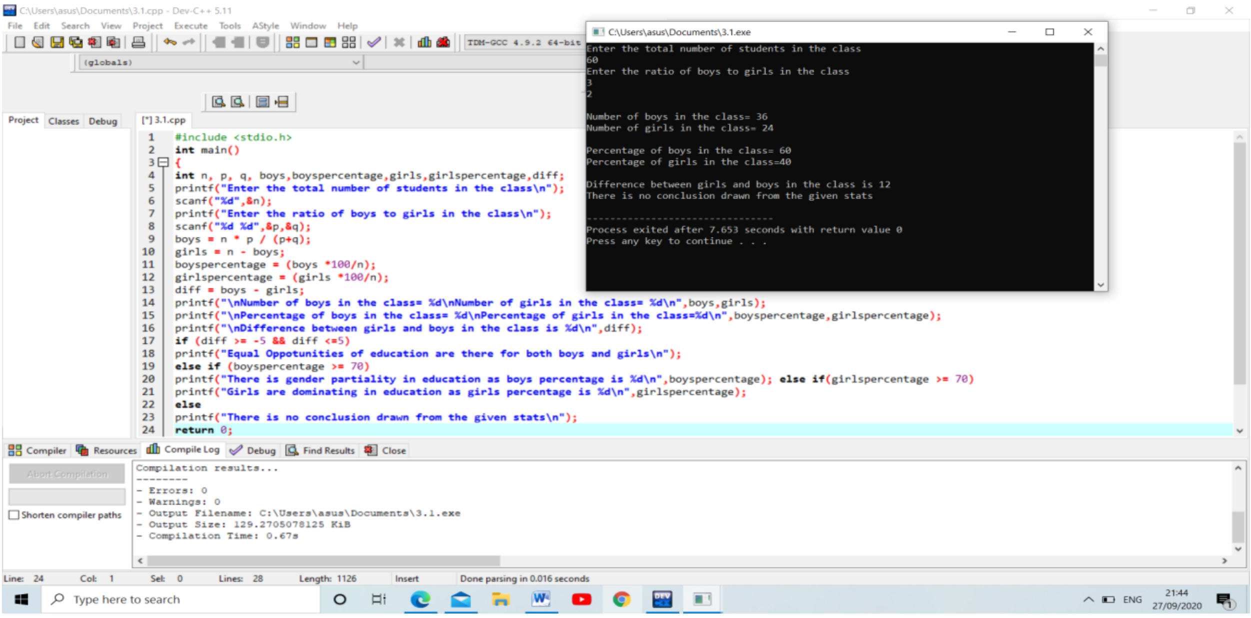
diff=n_boys- n_girls

Now if percentage of boys is more than or equal to 70 then gender partiality will be output.

If girls percentage is equal or more than 70 then girls domination will be output.

Otherwise no conclusion drawn.

OUTPUT :1.When neither percentage is more than 70



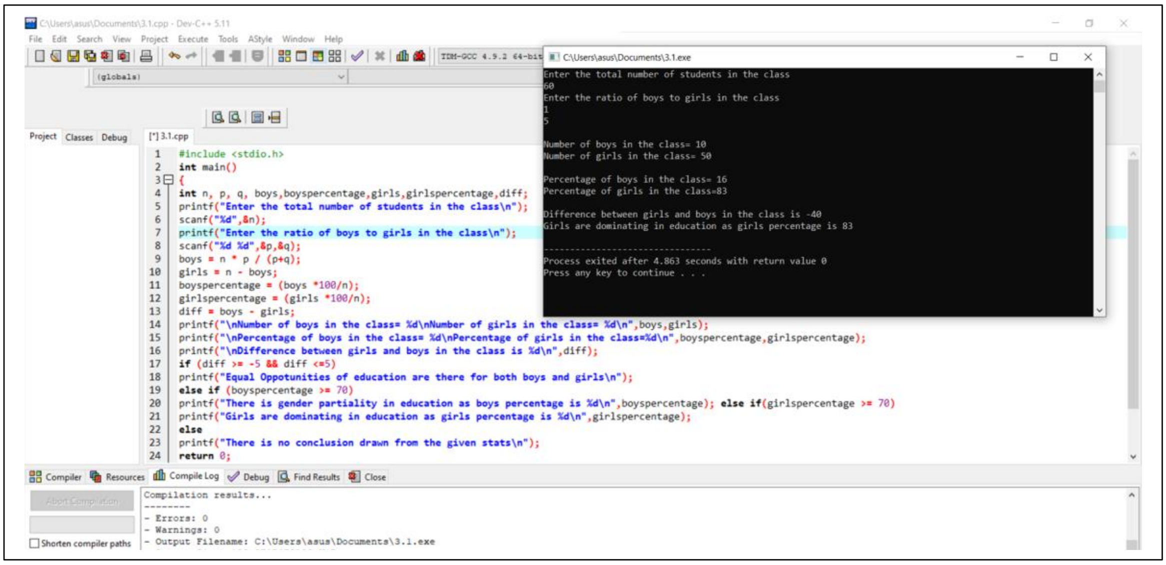
```
#include <stdio.h>
int main()
{
int n, p, q, boys,boyspercentage,girls,girlspercentage,diff;
printf("Enter the total number of students in the class\n");
scanf("%d",&n);
printf("Enter the ratio of boys to girls in the class\n");
scanf("%d %d",&p,&q);
boys = n * p / (p+q);
girls = n - boys;
boyspercentage = (boys *100/n);
girlspercentage = (girls *100/n);
diff = boys - girls;
printf("\nNumber of boys in the class= %d\nNumber of girls in the class= %d\n",boys,girls);
printf("\nPercentage of boys in the class= %d\nPercentage of girls in the class=%d\n",boyspercentage,girlspercentage);
printf("\nDifference between girls and boys in the class is %d\n",diff);
if (diff >= -5 && diff <=5)
printf("Equal Oppotunities of education are there for both boys and girls\n");
else if (boyspercentage >= 70)
printf("There is gender partiality in education as boys percentage is %d\n",boyspercentage); else if(girlspercentage >= 70)
printf("Girls are dominating in education as girls percentage is %d\n",girlspercentage);
else
printf("There is no conclusion drawn from the given stats\n");
return 0;
```

C:\Users\asus\Documents\3.1.exe

```
Enter the total number of students in the class
60
Enter the ratio of boys to girls in the class
3
2

Number of boys in the class= 36
Number of girls in the class= 24

Percentage of boys in the class= 60
Percentage of girls in the class=40

Difference between girls and boys in the class is 12
There is no conclusion drawn from the given stats

--------------------------------
Process exited after 7.653 seconds with return value 0
Press any key to continue . . .
```

```
Compilation results...
--------
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\asus\Documents\3.1.exe
- Output Size: 129.2705078125 KiB
- Compilation Time: 0.67s
```

2.When girls percentage is more than 70.



```
#include <stdio.h>
int main()
{
int n, p, q, boys,boyspercentage,girls,girlspercentage,diff;
printf("Enter the total number of students in the class\n");
scanf("%d",&n);
printf("Enter the ratio of boys to girls in the class\n");
scanf("%d %d",&p,&q);
boys = n * p / (p+q);
girls = n - boys;
boyspercentage = (boys *100/n);
girlspercentage = (girls *100/n);
diff = boys - girls;
printf("\nNumber of boys in the class= %d\nNumber of girls in the class= %d\n",boys,girls);
printf("\nPercentage of boys in the class= %d\nPercentage of girls in the class=%d\n",boyspercentage,girlspercentage);
printf("\nDifference between girls and boys in the class is %d\n",diff);
if (diff >= -5 && diff <=5)
printf("Equal Oppotunities of education are there for both boys and girls\n");
else if (boyspercentage >= 70)
printf("There is gender partiality in education as boys percentage is %d\n",boyspercentage); else if(girlspercentage >= 70)
printf("Girls are dominating in education as girls percentage is %d\n",girlspercentage);
else
printf("There is no conclusion drawn from the given stats\n");
return 0;
```

C:\Users\asus\Documents\3.1.exe

```
Enter the total number of students in the class
60
Enter the ratio of boys to girls in the class
1
5

Number of boys in the class= 10
Number of girls in the class= 50

Percentage of boys in the class= 16
Percentage of girls in the class=83

Difference between girls and boys in the class is -40
Girls are dominating in education as girls percentage is 83

--------------------------------
Process exited after 4.863 seconds with return value 0
Press any key to continue . . .
```

```
Compilation results...
--------
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\asus\Documents\3.1.exe
```

EXPERIMENT NUMBER – 3.2

STUDENT'S NAME –	NIKHIL
STUDENT'S UID –	20BET1042
CLASS AND GROUP –	BE IT
SEMESTER –	1ST

TOPIC OF EXPERIMENT –

Practical 3.2: Write a menu driven program that allow the user to perform any one of the following operations based on the input given by user
i Check number is even or odd
ii Check number is positive or negative
iii Printing square of the number
iv Printing square root of the number (use math.h)
Use switch statement for a menu driven program. Also, use validation checks wherever necessary

AIM OF THE EXPERIMENT –

– LEARN HOW TO APPLY DECISION MAKING STATEMENTS SUCH AS IF-ELSE, NESTED IF-ELSE, SWITCH STATEMENTS WHILE DEVELOPING MENU DRIVEN PROGRAMS FOR USERS.
PREREQUISITES- BASIC KNOWLEDGE OF WORKING OF OPERATORS, KNOWLEDGE OF DECISION STATEMENT.

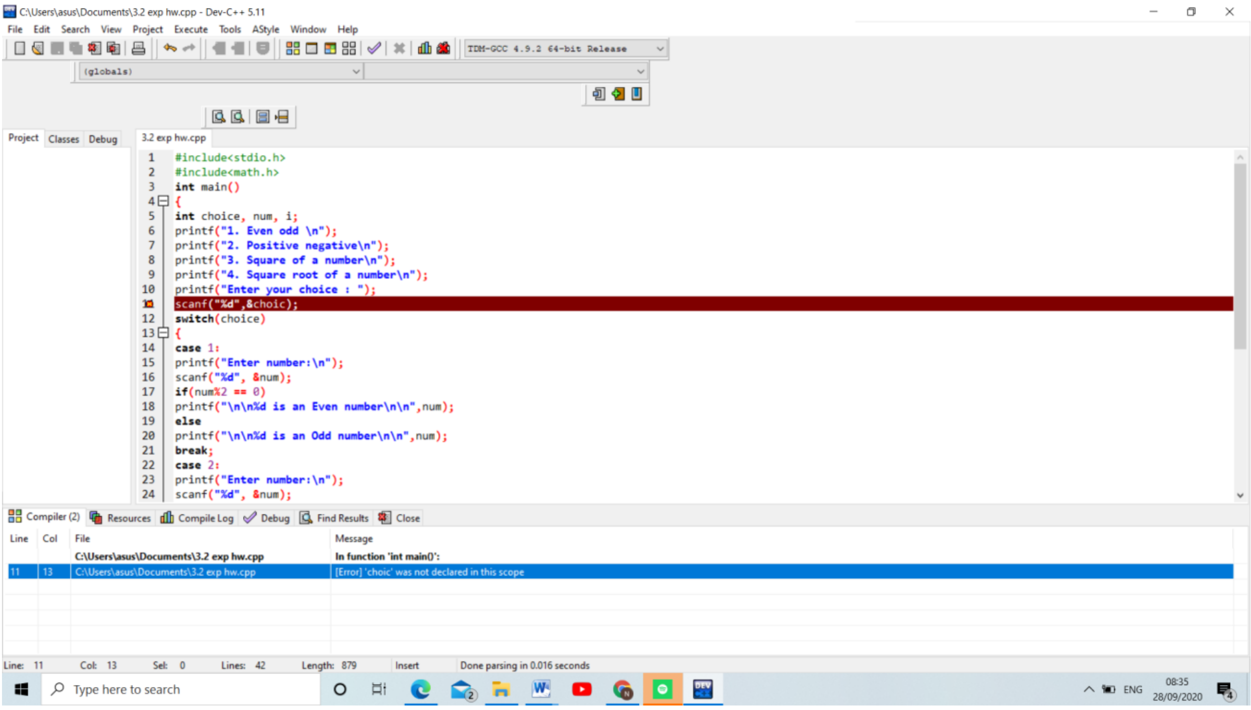
PROGRAM CODE

```
#include<stdio.h>
#include<math.h>
int main()
{
int choice, num, i;
printf("1. Even odd \n");
printf("2. Positive negative\n");
printf("3. Square of a number\n");
printf("4. Square root of a number\n");
printf("Enter your choice : ");
scanf("%d",&choice);
switch(choice)
{
case 1:
printf("Enter number:\n");
scanf("%d", &num);
if(num%2 == 0)
printf("\n\n%d is an Even number\n\n",num);
else
printf("\n\n%d is an Odd number\n\n",num);
break;
case 2:
```

```
printf("Enter number:\n");
scanf("%d", &num);
if(num>0)
printf("\nnumber is positive number\n\n");
else
printf("\nnumber is negative number\n\n");
break;
case 3:
printf("Enter number:\n");
scanf("%d", &num);
printf("Square of a number is %d",num*num); break;
case 4:
printf("Enter number:\n");
scanf("%d", &num);
printf("Square root of a number is %.2f", sqrt(num));
break;
}
return 0;
}
```

ERRORS ENCOUNTERED DURING PROGRAM'S EXECUTION

At when I was declairing choice I write choic instead of choice so it cause Error:Choice was not declared.


C:\Users\asus\Documents\3.2 exp hw.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
3.2 exp hw.cpp
Compiler (2) Resources Compile Log Debug Find Results Close
Type here to search
ENG
08:35
28/09/2020

```
#include<stdio.h>
#include<math.h>
int main()
{
int choice, num, i;
printf("1. Even odd \n");
printf("2. Positive negative\n");
printf("3. Square of a number\n");
printf("4. Square root of a number\n");
printf("Enter your choice : ");
scanf("%d",&choic);
switch(choice)
{
case 1:
printf("Enter number:\n");
scanf("%d", &num);
if(num%2 == 0)
printf("\n\n%d is an Even number\n\n",num);
else
printf("\n\n%d is an Odd number\n\n",num);
break;
case 2:
printf("Enter number:\n");
scanf("%d", &num);
```

Line	Col	File	Message
		C:\Users\asus\Documents\3.2 exp hw.cpp	In function 'int main()':
11	13	C:\Users\asus\Documents\3.2 exp hw.cpp	[Error] 'choic' was not declared in this scope

```
Line: 11   Col: 13   Sel: 0   Lines: 42   Length: 879   Insert   Done parsing in 0.016 seconds
```

PROGRAMS' EXPLANATION (in brief)

First thing notice in our mind why we use math.h too because to find square root we will use sqrt function which is part of math.h library.

In the question since there are multiple conditions so we will use switch statement.

The switch statement in C language is used *to execute the code from multiple conditions*.

Rules for switch statement in C language

1) The *switch expression* must be of integer or character type.

2) The *case value* must be integer or character constant.

3) The *case value* can be used only inside the switch statement.

4) The *break statement* in switch case is not must. It is optional. If there is no break statement found in switch case, all the cases will be executed after matching the case value. It is known as *fall through* state of C switch statement.

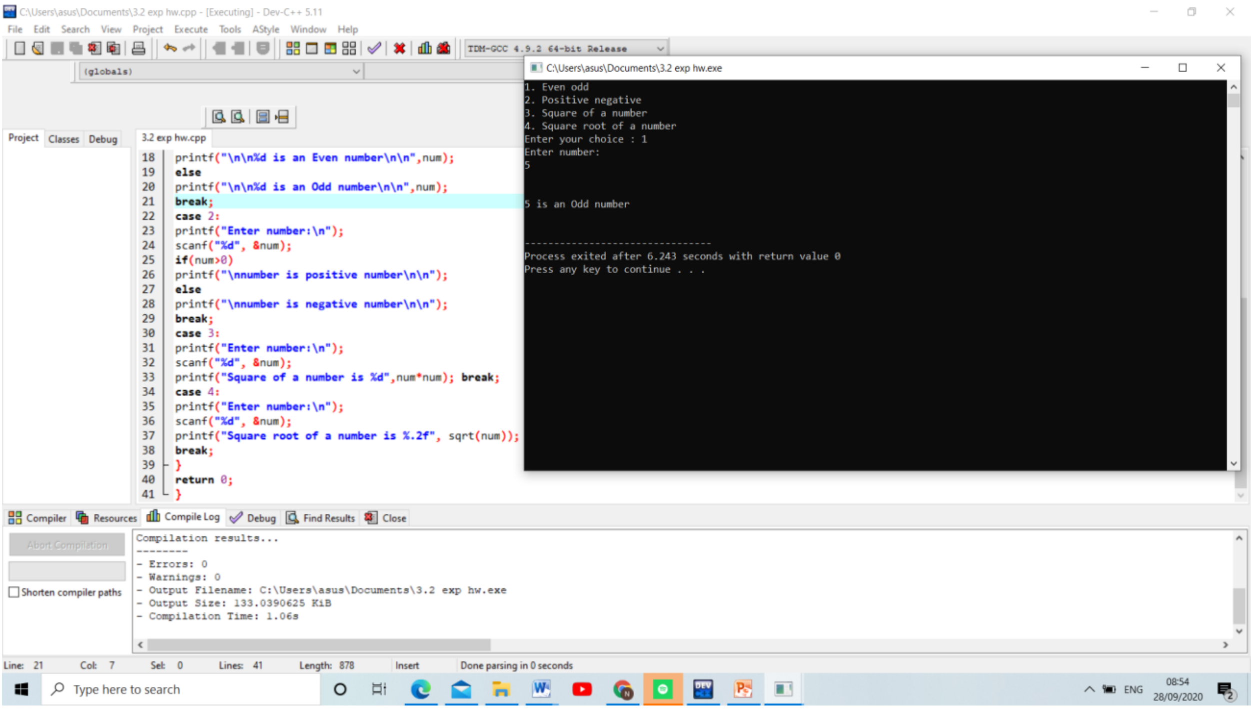
Now first we will use switch case and divide into four parts as shown in program and when we type specific case we will get output according to our need.

As we saw, in above code break is use though it is not must if we don't use break then we can say

C Switch statement is fall-through

In C language, switch statement is fall through, it means if you don't use break statement in switch case, all the case after matching case will be executed.

OUTPUT :1.When user wants to find whether no. is even or odd he will use case 1.



C:\Users\asus\Documents\3.2 exp hw.cpp - [Executing] - Dev-C++ 5.11

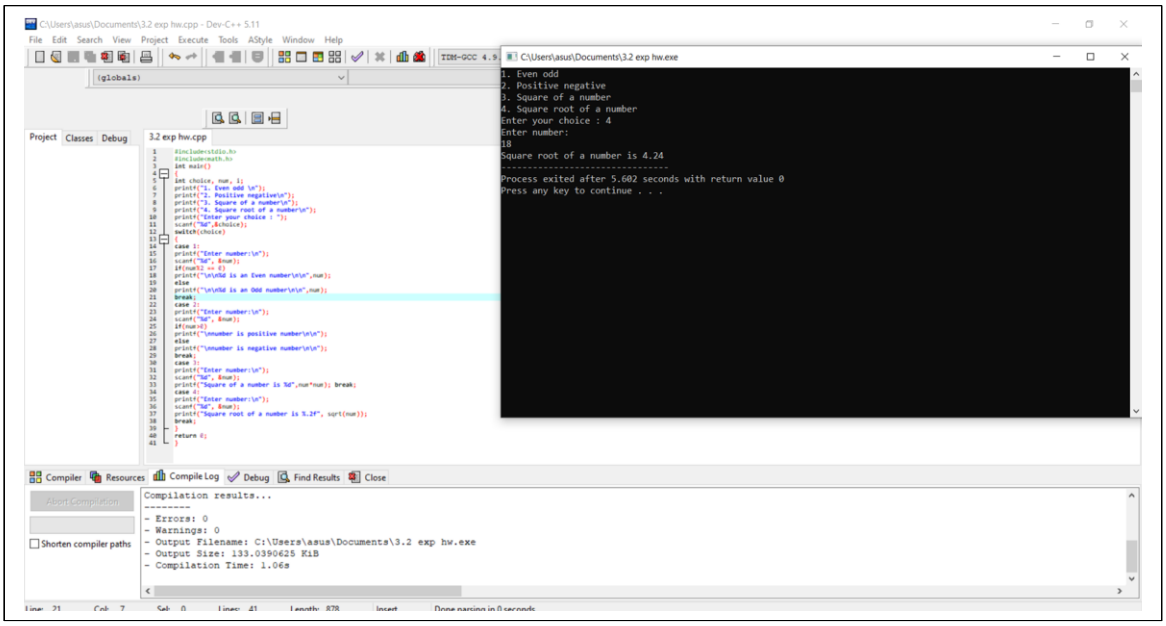
```
printf("\n\n%d is an Even number\n\n",num);
else
printf("\n\n%d is an Odd number\n\n",num);
break;
case 2:
printf("Enter number:\n");
scanf("%d", &num);
if(num>0)
printf("\nnumber is positive number\n\n");
else
printf("\nnumber is negative number\n\n");
break;
case 3:
printf("Enter number:\n");
scanf("%d", &num);
printf("Square of a number is %d",num*num); break;
case 4:
printf("Enter number:\n");
scanf("%d", &num);
printf("Square root of a number is %.2f", sqrt(num));
break;
}
return 0;
}
```

C:\Users\asus\Documents\3.2 exp hw.exe

```
1. Even odd
2. Positive negative
3. Square of a number
4. Square root of a number
Enter your choice : 1
Enter number:
5


5 is an Odd number



--------------------------------
Process exited after 6.243 seconds with return value 0
Press any key to continue . . .
```

```
Compilation results...
--------
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\asus\Documents\3.2 exp hw.exe
- Output Size: 133.0390625 KiB
- Compilation Time: 1.06s
```

2. When user want to fine square root of number he will use case 4



C:\Users\asus\Documents\3.2 exp hw.cpp - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.
(globals)
Project Classes Debug
3.2 exp hw.cpp
C:\Users\asus\Documents\3.2 exp hw.exe
Compiler Resources Compile Log Debug Find Results Close
Abort Compilation
□ Shorten compiler paths
Line: 21 Col: 7 Sel: 0 Lines: 41 Length: 878 Insert Done parsing in 0 seconds

```c
#include<stdio.h>
#include<math.h>
int main()
{
int choice, num, i;
printf("1. Even odd \n");
printf("2. Positive negative\n");
printf("3. Square of a number\n");
printf("4. Square root of a number\n");
printf("Enter your choice : ");
scanf("%d",&choice);
switch(choice)
{
case 1:
printf("Enter number:\n");
scanf("%d", &num);
if(num%2 == 0)
printf("\n\n%d is an Even number\n\n",num);
else
printf("\n\n%d is an Odd number\n\n",num);
break;
case 2:
printf("Enter number:\n");
scanf("%d", &num);
if(num>0)
printf("\nnumber is positive number\n\n");
else
printf("\nnumber is negative number\n\n");
break;
case 3:
printf("Enter number:\n");
scanf("%d", &num);
printf("Square of a number is %d",num*num); break;
case 4:
printf("Enter number:\n");
scanf("%d", &num);
printf("Square root of a number is %.2f", sqrt(num));
break;
}
return 0;
}
```

```
1. Even odd
2. Positive negative
3. Square of a number
4. Square root of a number
Enter your choice : 4
Enter number:
18
Square root of a number is 4.24
--------------------------------
Process exited after 5.602 seconds with return value 0
Press any key to continue . . .
```

```
Compilation results...
--------
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\asus\Documents\3.2 exp hw.exe
- Output Size: 133.0390625 KiB
- Compilation Time: 1.06s
```

EXPERIMENT NUMBER – 3.3

STUDENT'S NAME –	NIKHIL
STUDENT'S UID –	20BET1042
CLASS AND GROUP –	BE IT
SEMESTER –	1ST

TOPIC OF EXPERIMENT –

Practical 3.3:

Amba Aambika and Ambalika have money in the ratio x:y:z. All go to market and spend money in ratio p:q:r . Total money they have initially is Rs. N. Total money spent by them is M. After spending money in the market who has maximum amount left with?

AIM OF THE EXPERIMENT –

– LEARN HOW TO APPLY DECISION MAKING STATEMENTS SUCH AS IF-ELSE, NESTED IF-ELSE, SWITCH STATEMENTS WHILE DEVELOPING MENU DRIVEN PROGRAMS FOR USERS.
PREREQUISITES- BASIC KNOWLEDGE OF WORKING OF OPERATORS, KNOWLEDGE OF DECISION STATEMENT.

PROGRAM CODE

```
#include <stdio.h>
int main(void) {
float x,y,z,p,q,r,N,M,m1,m2,m3,Ma,Mb,Mc,Sa,Sb,Sc;
printf("Enter money ratio:x,y,z\n");
scanf("%f%f%f",&x,&y,&z);
printf("Enter spending money ratio:p,q,r\n");
 scanf("%f%f%f",&p,&q,&r);
printf("Enter total initial money:\n");
scanf("%f",&N);
printf("Enter total money spent:\n");
scanf("%f",&M);
Ma=x*N/(x+y+z);
Mb=y*N/(x+y+z);
Mc=z*N/(x+y+z);
Sa=p*M/(p+q+r);
Sb=q*M/(p+q+r);
Sc=r*M/(p+q+r);
m1=Ma-Sa;
m2=Mb-Sb;
m3=Mc-Sc;
printf("Money saved by A : %f",m1);
printf("Money saved by B : %f",m2);
printf("Money saved by C : %f",m3);
if(m1>m2)
{
if(m1>m3)
printf("amba has left with max. amount\n");
else
printf("ambalika has left with max. amount\n");
}
else if(m2>m3)
printf("aambika has left with max. amount\n");
else
printf("ambalika has left with max. amount\n");
return 0;
}
```

ERRORS ENCOUNTERED DURING PROGRAM'S EXECUTION

No

PROGRAMS' EXPLANATION (in brief)

Observing this program first thing come in our mind how these formula form. Using help of my teacher I am unable to explain this.

first we will enter total money and money ratio of 3 girls now we know ratio is x:y:z ans spending ratio p:q:r

so we can say a(x+y+z)=n or

a=n/(x+y+z)   where a is just factor by which ratio devide and

multiply x by a we get money first girl have and y by a money 2nd girl have similarly for 3rd girl.

so in above formula multiply x ,y, z both sides respectively we will get their money , Thats how below formulas form

money with A(Ma)=x*N/(x+y+z)

money with B(Mb)=y*N/(x+y+z)

money with C(Mc)=z*N/(x+y+z)

Similarly we can money they spent :

money spent by A(Sa)=p*M/(p+q+r)

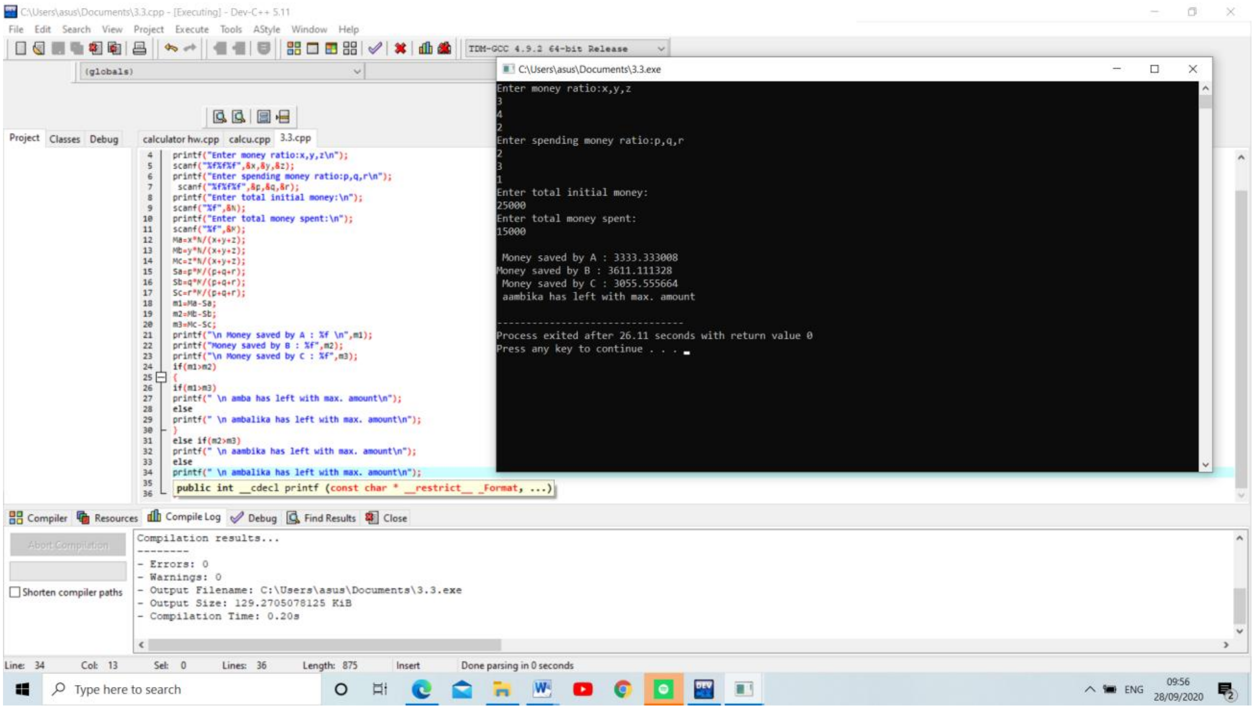
money spent by B(Sb)=q*M/(p+q+r)

money spent by C(Sc)=r*M/(p+q+r)

After the difference of money have and money spent of each girl respectively using

Nesting if else we will get which girl has maximum money .

OUTPUT :


C:\Users\asus\Documents\3.3.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
calculator hw.cpp calcu.cpp 3.3.cpp
C:\Users\asus\Documents\3.3.exe

```
printf("Enter money ratio:x,y,z\n");
scanf("%f%f%f",&x,&y,&z);
printf("Enter spending money ratio:p,q,r\n");
 scanf("%f%f%f",&p,&q,&r);
printf("Enter total initial money:\n");
scanf("%f",&N);
printf("Enter total money spent:\n");
scanf("%f",&M);
Ma=x*N/(x+y+z);
Mb=y*N/(x+y+z);
Mc=z*N/(x+y+z);
Sa=p*M/(p+q+r);
Sb=q*M/(p+q+r);
Sc=r*M/(p+q+r);
m1=Ma-Sa;
m2=Mb-Sb;
m3=Mc-Sc;
printf("\n Money saved by A : %f \n",m1);
printf("Money saved by B : %f",m2);
printf("\n Money saved by C : %f",m3);
if(m1>m2)
{
if(m1>m3)
printf(" \n amba has left with max. amount\n");
else
printf(" \n ambalika has left with max. amount\n");
}
else if(m2>m3)
printf(" \n aambika has left with max. amount\n");
else
printf(" \n ambalika has left with max. amount\n");
public int __cdecl printf (const char * __restrict__ _Format, ...)
```

```
Enter money ratio:x,y,z
3
4
2
Enter spending money ratio:p,q,r
2
3
1
Enter total initial money:
25000
Enter total money spent:
15000

 Money saved by A : 3333.333008
Money saved by B : 3611.111328
 Money saved by C : 3055.555664
 aambika has left with max. amount

--------------------------------
Process exited after 26.11 seconds with return value 0
Press any key to continue . . .
```

```
Compilation results...
--------
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\asus\Documents\3.3.exe
- Output Size: 129.2705078125 KiB
- Compilation Time: 0.20s
```

Line: 34 Col: 13 Sel: 0 Lines: 36 Length: 875 Insert Done parsing in 0 seconds
Type here to search
ENG 09:56 28/09/2020

EXPERIMENT NUMBER – 3.4

STUDENT'S NAME – NIKHIL

STUDENT'S UID – 20BET1042

CLASS AND GROUP – BE IT

SEMESTER – 1ST

TOPIC OF EXPERIMENT –

Practical 3.4:
While travelling in a train, you observe some college students pulling the alarm chain simply to get down at their desired point. Out of n students m<=n times students pull the chain. You have to print according to the following:
1) If m is >=80 % of n then print strict action is required to restrict this event
2) If m is between 50 to 80 % then print guidelines should be issued
3) If between 10 to 50% then print request to restrict the event
4) If less than 10% then print No action required

AIM OF THE EXPERIMENT –

– LEARN HOW TO APPLY DECISION MAKING STATEMENTS SUCH AS IF-ELSE, NESTED IF-ELSE, SWITCH STATEMENTS WHILE DEVELOPING MENU DRIVEN PROGRAMS FOR USERS.
PREREQUISITES- BASIC KNOWLEDGE OF WORKING OF OPERATORS, KNOWLEDGE OF DECISION STATEMENT.

PROGRAM CODE

```
#include<stdio.h>
int main()
{
int n,m;
printf("Enter total number of students in the train\n");
scanf("%d",&n);
printf("Enter no. of students pull the chain\n");
scanf("%d",&m);
float percentage = ((float)m/n)*100;
if (m>n)
printf("number of students who pulled can not be greater than students present in the train\n");
else
{
if(percentage >= 80)
printf("Strict Action Required\n");
else if(percentage>=50 && percentage<=80)
printf("Guidlines to be issued\n");
else if(percentage>=10 && percentage<50)
printf("Restrict the action\n");
else if(percentage<10)
printf("No action Required\n"); }
}
```

ERRORS ENCOUNTERED DURING PROGRAM’S EXECUTION

No

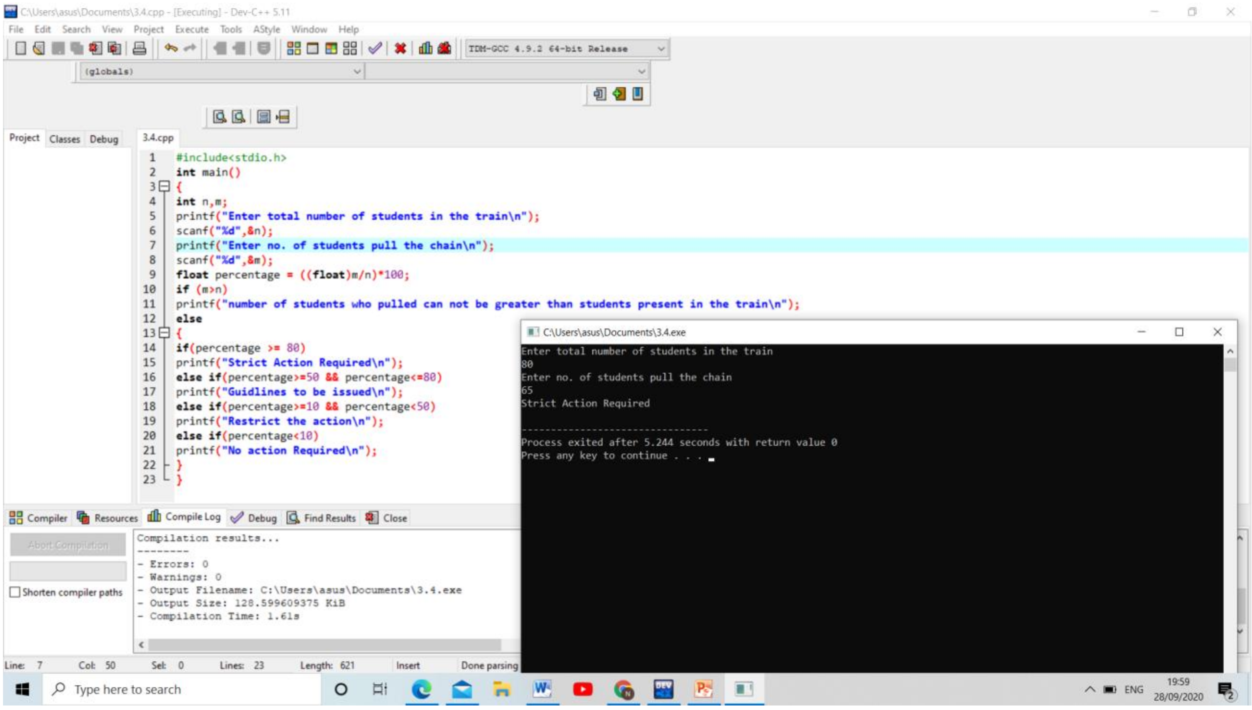
PROGRAMS’ EXPLANATION (in brief)

First we will define identifiers m and n as total students in train and students who pull the chain.

Now we will find their percentage .

Now using Nesting if else statement we will get our output.
If (m>n)
We will Print number of students who pulled can not be greater than students present in the train
Similarly according to our question we will define other statements and get output as we want.
Output is shown below.

OUTPUT :Now suppose no. of students are 80 and 65 pulled the train so percentage will be more than 80 so strict actions will taken.


C:\Users\asus\Documents\3.4.cpp - [Executing] - Dev-C++ 5.11
File Edit Search View Project Execute Tools AStyle Window Help
TDM-GCC 4.9.2 64-bit Release
(globals)
Project Classes Debug
3.4.cpp

```c
#include<stdio.h>
int main()
{
int n,m;
printf("Enter total number of students in the train\n");
scanf("%d",&n);
printf("Enter no. of students pull the chain\n");
scanf("%d",&m);
float percentage = ((float)m/n)*100;
if (m>n)
printf("number of students who pulled can not be greater than students present in the train\n");
else
{
if(percentage >= 80)
printf("Strict Action Required\n");
else if(percentage>=50 && percentage<=80)
printf("Guidlines to be issued\n");
else if(percentage>=10 && percentage<50)
printf("Restrict the action\n");
else if(percentage<10)
printf("No action Required\n");
}
}
```

```
Compilation results...
--------
- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\asus\Documents\3.4.exe
- Output Size: 128.599609375 KiB
- Compilation Time: 1.61s
```

Line: 7 Col: 50 Sel: 0 Lines: 23 Length: 621 Insert Done parsing
C:\Users\asus\Documents\3.4.exe

```
Enter total number of students in the train
80
Enter no. of students pull the chain
65
Strict Action Required

--------------------------------
Process exited after 5.244 seconds with return value 0
Press any key to continue . . .
```