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EXPERIMENT NUMBER : Practical 3.1

TOPIC OF THE EXPERIMENT :

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 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.

FLOWCHART / ALGORITHM :
(i) Start the program.
(ii) Declaration of variables n, p, q, boys, boyspercentage,girls,girlspercentage,diff in integer datatype.
(iii) Print "Enter the total number of students in the class".
(iv) Accept the input of total number of students from user.
(v) Print "Enter the ratio of boys to girls in the class".
(vi) Accept the input of ratio of boys to girls from the user.

(vii) Calculate the number of boys by using the formula : boys = n * p / (p+q).
(viii) Calculate the number of girls by using the formula : girls = n - boys.
(ix) Calculate the percentage of boys using the formula : boyspercentage = (boys *100/n).
(x) Calculate the percentage of girls using the formula : girlspercentage = (girls *100/n).
(xi) Calculate the difference between boys and girls using the formula : diff = boys - girls.
(xii) Print "Number of boys in the class = " and "Number of girls in the class = " and the value of the number of boys and girls in the class.
(xiii) Print "Percentage of boys in the class = " and "Percentage of girls in the class = " and the values of percentage of boys and girls in the class.
(xiv) Print "Difference between girls and boys in the class is " and the value of difference between girls and boys.
(xv) Check the condition by using if else statement and print the message according to it.
(xvi) End the program by returning an integer..

PROGRAM CODE :

```
//creating a header file
#include <stdio.h>
//function which returns integer value
int main()
{
//declaration of variables in integer datatype
int n, p, q,  boys,boyspercentage,girls,girlspercentage,diff;
//print the message
 printf("Enter the total number of students in the class\n");
//accept the input of total number of students  from user
```

```c
scanf("%d",&n);
//print the message
printf("Enter the ratio of boys to girls in the class\n");
//accept the input of  ratio of boys to girls from  the user
scanf("%d %d",&p,&q);
//calculate the number of boys by multiplying total number of
students with ratio of boys and divide it by sum of ratio of
boys and girls
boys = n * p / (p+q);
//calculate the number of girls by subtracting no.of boys from
total number of students
girls = n - boys;
//calculate the  percentage of boys  by multiply number of
boys with 100 and divide it by total number of students
boyspercentage = (boys *100/n);
//calculate the       percentage of girls by multiplying number
of girls with 100 and divide it by total no.of students
girlspercentage = (girls *100/n);
//calculate the difference between  boys and girls by
subtracting no. of girls from no. of boys
diff = boys - girls;
//print the number of boysand girls
printf("\nNumber of boys in the class= %d\nNumber of girls
in the class= %d\n",boys,girls);
//print the boys and girls percentage
printf("\nPercentage of boys in the class= %d\nPercentage of
girls in the class= %d\n",boyspercentage,girlspercentage);
//print the difference between boys and girls
printf("\nDifference between girls and boys in the class is
%d\n",diff);
//check the condition usin if else statement and print the
message according to it and the values
 if (diff >= -5 && diff <=5)
```

```c
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 an integer value
return 0;
}
```

ERRORS ENCOUNTERED DURING PROGRAM'S EXECUTION -
(Kindly jot down the compile time errors encounted)

No Errors.

PROGRAM'S EXPLAINATION (In Brief)

In this program we have to find the number of boys and girls in the class and print the message according to the given conditions.Calculate number of boys in the class by using the formula : boys = n * p / (p+q).
Calculate the percentage of girls using the formula : girlspercentage = (girls *100/n).
Calculate the difference between boys and girls using the formula : diff = boys - girls.

OUTPUT :

```
                                                  input
Enter the total number of students in the class
70
Enter the ratio of boys to girls in the class
5 2

Number of boys in the class= 50
Number of girls in the class= 20

Percentage of boys in the class= 71
Percentage of girls in the class= 28

Difference between girls and boys in the class is 30
There is gender partiality in education as boys percentage is 71
```

EXPERIMENT NUMBER : Practical 3.2

TOPIC OF THE EXPERIMENT :
 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.

FLOWCHART / ALGORITHM:

(i) Start the program.

(ii) Variables choice, num, i are declared in integer datatype.

(iii) while loop is used to evaluate the statements inside the body of loop.

(iv) Print "1.Even odd".

(v) Print "2. Positive negative".

(vi) Print "3. Square of a number".

(vii) Print "4. Squareroot of a number".

(viii) Print "5. Exit".

(ix) Print "Enter your choice : "

(x) Accept the input from the user.

(xi) Switch statement is used to check the condition.

(xii) Code to be executed according to the choice of the user and print the message according to it and accept the input from the user.

(xiii) if else statement is used to check the condition and print the message according to it.

(xiv) break statement is used to terminate the loop.

(xv) Print " Square of a number is" and the square of the number .

(xvi) Print " Square root of a number is " and the square root of the number.

(xvii) exit(0) shows that the loop will successfully executed.

(xviii) End the program by returning an integer value.

PROGRAM CODE:

```
//creating a header file
#include<stdio.h>
//function which is used for mathematical operations like squareroot
#include<math.h>
//function returns integer type value
 int main()
```

```c
{
//declaration of variables of integer datatype
int choice, num, i;
//loop will be executed and print the message according to it
and accept the input of choice from the user
 while(1)
{
printf("1. Even odd \n");
printf("2. Positive negetive\n");
printf("3. Square of a number\n");
printf("4. Squareroot of a number\n");
printf("5. Exit\n\n\n");
printf("Enter your choice : ");
scanf("%d",&choice);
switch(choice)
//code to be executed according to the choice of the user and
print the message according to it and accept the input from the
user  case 1:
printf("Enter number:\n");
scanf("%d", &num);
//checking the condition that number is divisible by 2 or not
using if else statement and print the message according to it
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);
//loop will terminate
break;
case 2:
printf("Enter number:\n");
scanf("%d", &num);
//checking the condition that number is greater than 0 or not
using if else statement and print the message according to it
```

```c
if(num>0)
printf("\nnumber is positive number\n\n");
else
printf("\nnumber is negetive number\n\n");
//loop will terminate
break;
case 3:
printf("Enter number:\n");
scanf("%d", &num);
//print the message and calculate the square of number by
multiplying it 2 times
 printf("Square of a number is %d", num*num);
//loop will terminate
break;
case 4:
printf("Enter number:\n");
scanf("%d", &num);
//print the message and calculate the squareroot of number
 printf("Square root of a number is %d", sqrt(num));
//loop will terminate
break;
case 5:
// loop will successfully executed
exit(0);
}
}
//returning an integer value
return 0;
}
```

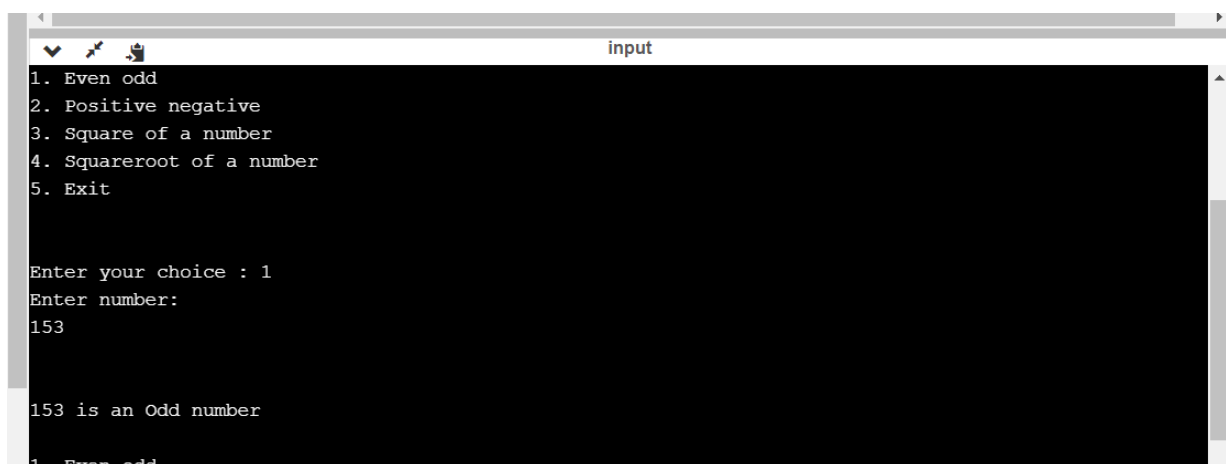## ERRORS ENCOUNTERED DURING PROGRAM'S EXECUTION -

(Kindly jot down the compile time errors encounted)

No Errors.

PROGRAM'S EXPLAINATION (In Brief)

In this program we have to use switch statement to check the given conditions.

OUTPUT :

```
                                    input
1. Even odd
2. Positive negative
3. Square of a number
4. Squareroot of a number
5. Exit


Enter your choice : 1
Enter number:
153


153 is an Odd number

1  Even odd
```

EXPERIMENT NUMBER- Practical 3.3

TOPIC OF EXPERIMENT:

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 .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.

FLOWCHART / ALGORITHM:

1. Start the program.
2. Declaration of variables amba, aambika and ambalika in integer datatype for the money each one have.
3. Declaration of variables x,y,z, for initial money ratio they have, n for total money and p,q,r for spending money ratio in integer datatype.
4. Print "Enter initial money ratio".
5. Accept the input of initial money ratio from user.
6. Print "Enter total money".
7. Accept the input of total money from user.
8. Print "Enter spending money ratio".
9. Accept the input of spending money ratio from the user.
10. Calculate the money each one have.
11. Check the condition using if else if else statements that who have max money left and print the message.
12. End the program by returning integer value.

PROGRAM CODE:

```
//creating a header file
#include<stdio.h>
//function which returns integer type value
int main()
{
//declaration of variables in integer datatype
 int amba,aambika,ambalika;
//declaration of variables in integer datatype
 int x,y,z,n,p,q,r;
//print the message
printf("\nEnter initial money ratio");
//accept the input of initial money ratio from user
```

```c
scanf("%d%d%d",&x,&y,&z);
//print the message
printf("\nEnter total money");
//accept the input of total money  from user
scanf("%d",&n);
//print the message
printf("\nEnter spending money ratio");
//accept the input of spending money ratio from the user
scanf("%d%d%d",&p,&q,&r);
   //Calculate the money each one have by dividing the
product of each one initial money ratio and total money by the
sum of their initial money ratio//
   amba=(x*n)/(x+y+z);
   aambika=(y*n)/(x+y+z);
   ambalika=(z*n)/(x+y+z);
   //Check the condition using if else if else statements that
who have max money left by the comparing the difference of
money they have and spending money ratio and print the
   message//
   if(amba-p<aambika-q)
   {
      if(aambika-q>ambalika-r)
      {
         printf("AAMBA HAS MAX MONEY");
      }
      else
      {
         printf("AMBALIKA HAS MAX MONEY");
      }
   }
   else
   {
      if(amba-p>ambalika-r)
```

```
        {
            printf("AAMBA HAS MAX MONEY");
        }
    else
        {
            printf("AMBALIKA HAS MAX MONEY");
        }
    }
//return an integer value
return 0;
}
```

ERRORS ENCOUNTERED DURING PROGRAM'S EXECUTION :

(Kindly jot down the compile time errors counted)
No Errors.

PROGRAM'S EXPLAINATION (In Brief)

In this program we have to calculate the maximum amount of money left with whom after spending.Calculate the money each one have by dividing the product of each one initial moneyratio and total money by the sum of their initial money ratio.

OUTPUT :


```
Enter initial money ratio1
2
3

Enter total money100

Enter spending money ratio2
1
5
AMBALIKA HAS MAX MONEY

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

EXPERIMENT NUMBER : Practical 3.4

TOPIC OF EXPERIMENT :
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.

FLOWCHART / ALGORITHM :
1. Start the program.
2. Declaration of variables n, m for number of students in train and number of students who pulled the chain respectively in integer datatype.
3. Print "Enter total number of students in the train".
4. Accept the input of number of students from user.
5. Print "Enter no. of students pull the chain".
6. Accept the input of number of students who pulled the chain from the user.

7. Calculate the percentage of number of students who pull the chain by dividing the total number of students by number of students who pull the chain and multiply it by 100 and convert it into float datatype.
8. Checking the condition using if else statement and print the message according to it.
13. End the program by returning an integer value.

PROGRAM CODE :

```c
//creating a header file
#include<stdio.h>
//function which returns integer type value
int main()
{
//declaration of variables in integer datatype
int n,m;
//print the message
 printf("Enter total number of students in the train\n");
//accept the input of number of students in train  from user
scanf("%d",&n);
//print the message
 printf("Enter no. of students pull the chain\n");
//accept the input of number of students who pulled the chain
from the user
scanf("%d",&m);
/*Calculate the percentage of number of students who pull the
chain by dividing the total number of students by number of
students who pull the chain and  multiply it by 100* and
convert it into float datatype*/
float percentage = ((float)m/n)*100;
//Check the condition using nested if else statement and print
the message according to it //
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 :
(Kindly jot down the compile time errors counted)
No Errors.

PROGRAM'S EXPLAINATION (In Brief)
In this program we have to print the message according to the given condition.Calculate the percentage of number of students who pull the chain by dividing the total number of students by number of students who pull the chain and multiply it by 100 and convert it into float datatype.

OUTPUT :

```
Enter total number of students in the train
200
Enter no. of students pull the chain
400
number of students who pulled can not be greater than students present in the train


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

```
Enter total number of students in the train
200
Enter no. of students pull the chain
175
Strict Action Required


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

```
Enter total number of students in the train
200
Enter no. of students pull the chain
100
Guidlines to be issued


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

```
                                            input
Enter total number of students in the train
200
Enter no. of students pull the chain
25
Restrict the action


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



```
                                            input
Enter total number of students in the train
200
Enter no. of students pull the chain
5
No action Required


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

LEARNING OUTCOMES

• Identify situations where computational methods would be useful.
• Approach the programming tasks using techniques learnt and write pseudo-code.
• Choose the right data representation formats based on the requirements of the problem.
• Use the comparisons and limitations of the various programming constructs and choose the right one for the task.

EVALUATION COLUMN (To be filled by concerned faculty only)

Sr. No.	Parameters	Maximum Marks	Marks Obtained
1.	Student's performance while executing the program in Computer Lab	12	
2.	Completion of worksheet with learning outcomes and program's output along	10	

	with cleanliness and discipline.		
3.	Clarification of theoretical concepts	8	
4.	Total Marks	30	
5.	Teacher's Signature (with date)		