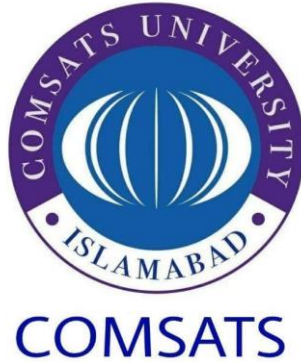


Lab Work 02
CSC103-Programming Fundamentals



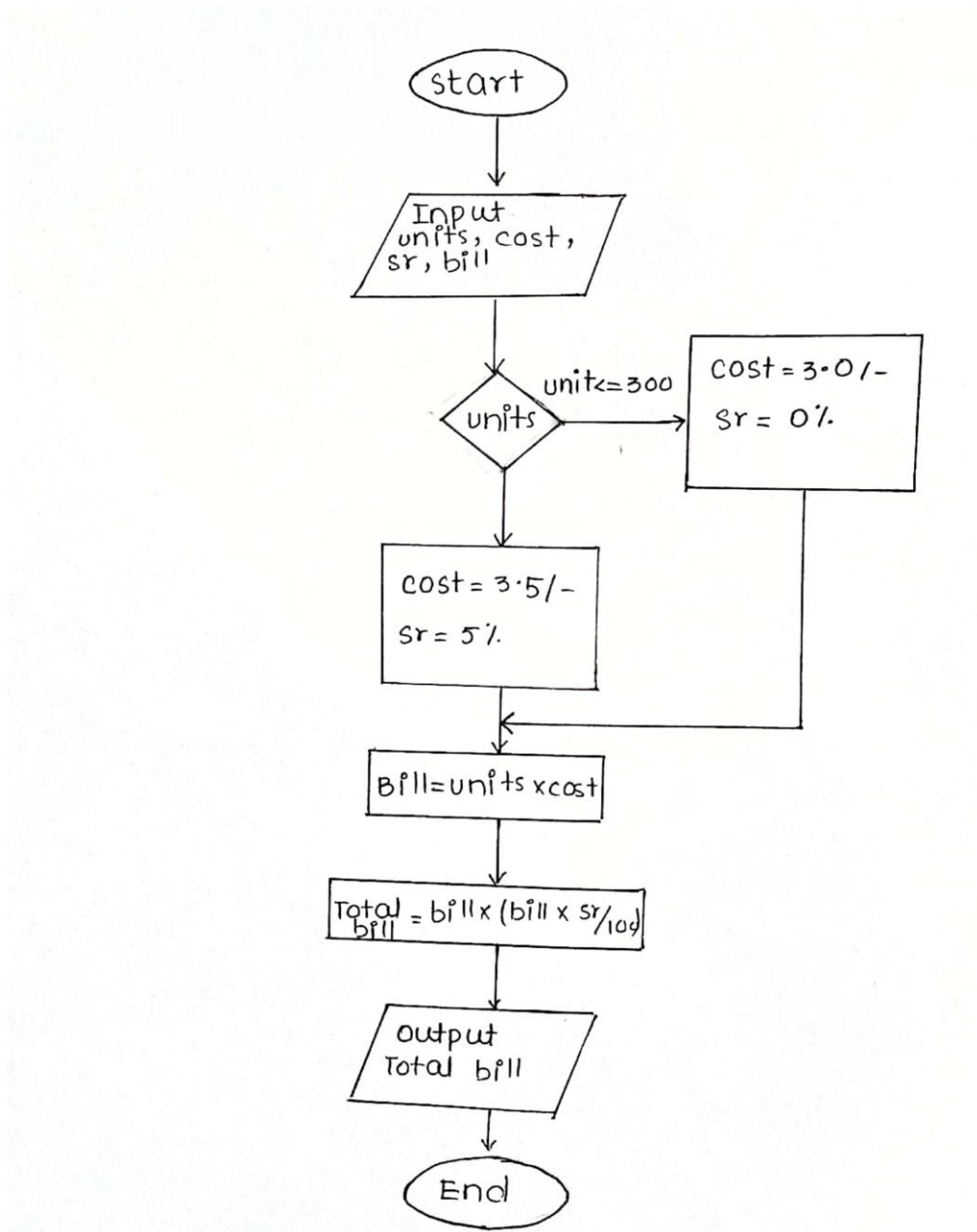
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Section: A
Submitted to:
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Submitted on: April 3, 2023

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Exercise 1: Write a program to calculate the electricity bill. The rates of electricity per unit are as follow:

- If the units consumed are equal or less than 300, then the cost is Rs. 3/- per unit
- If units consumed are more than 300, then the cost is Rs. 3.5/- per unit and surcharge of 5% of bill is added

Flowchart:



C source code:

Input:

```
// program is prepared by SP23-BCS-040 on 1-04-2023
// To calculate the electricity bill
#include<stdio.h>

int main()
{
    int units;
    float cost;
    float sr;
    float bill;

    printf("enter units\n");
    scanf("%d",&units);

    if(units<=300)
    {
        cost=3.0;
        sr=0;
        bill=units*3.0;
    }

    else//units>300
    {
        cost=3.5;
        sr=0.05;
        bill=cost+sr;
    }

    printf("%f=%d*%f",bill,units,cost);
}
```

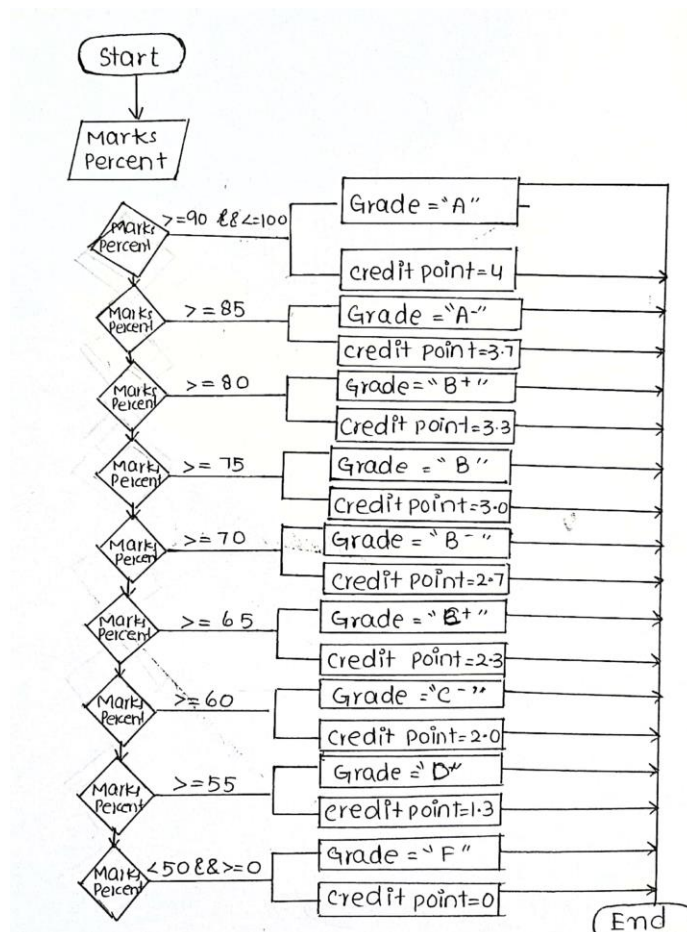
Output:

```
enter units
200
600.000000=200*3.000000
Process returned 0 (0x0)   execution time : 5.037 s
Press any key to continue.
```

Exercise 2: Write a program that reads 5 marks of different subjects out of 100 from the keyboard and determines and displays the sum and percentile of the marks. Then print grades and credit points on the basis of percentile as per following table:

Grades	Letter Grade	Credit Points	Percentage Marks
A	(Excellent)	4.0	90 and above
A-		3.7	85-89
B+		3.3	80-84
B	(Good)	3.0	75-79
B-		2.7	70-74
C+		2.3	65-69
C	(Average)	2.0	60-64
C-		1.7	55-59
D	(Minimum passing)	1.3	50-54
F	(Failing)	0.0	Less than 50

Flowchart:



C source code:

Input:

//this code is written by SP23-BCS-040 on 1-04-2023

//To calculate the percentage of marks

#include<stdio.h>

```
int main()
{
    int mth;
    int eng;
    int urdu;
    int com;
    int phy;
    int sum;
    int percent;

    printf("enter marks of mth");
    scanf("%d",&mth);

    printf("enter marks of eng");
    scanf("%d",&eng);

    printf("enter marks of urdu");
    scanf("%d",&urdu);

    printf("enter marks of com");
    scanf("%d",&com);

    printf("enter marks of phy");
    scanf("%d",&phy);

    sum=mth+eng+urdu+com+phy;
    percent=(float)sum/500*100;
    printf("percent=%d\n",percent);

    if(percent>=90 && percent<=100)
    { printf("grade=A");
      printf("credit points=4");}
    else if(percent>=85)
    { printf("grade=A-");
      printf("credit points=3.7");}
    else if(percent>=80)
    { printf("grade=B+");
      printf("credit points=3.3");}
    else if(percent>=75)
```

```

{printf("grade=B");
printf("credit points=3.0");}
else if(percent>=70)
{printf("grade=B-");
printf("credit points=2.7");}
else if(percent>=65)
{printf("grade=C+");
printf("credit point=2.3");}
else if(percent>=60)
{printf("grade=C");
printf("credit points=2.0");}
else if(percent>=55)
{printf("grade=C-");
printf("credit points=1.7");}
else if(percent>=50)
{printf("grade=D");
printf("credit points=1.3");}
else if(percent<50 && percent>=0)
{printf("grade=F");
printf("credit points=0.0");}
else
printf("invalid calcilation!!!\n");
return 0;
}

```

Output:

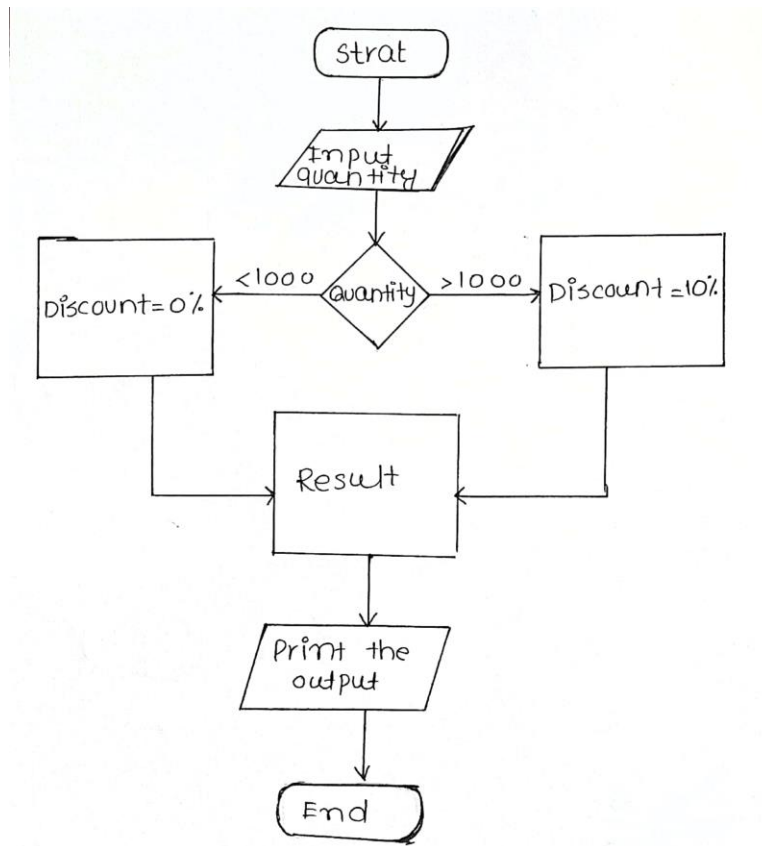
```

enter marks of mth90
enter marks of eng85
enter marks of urdu89
enter marks of com95
enter marks of phy86
percent=89
grade=A-credit points=3.7
Process returned 0 (0x0)   execution time : 33.324 s
Press any key to continue.

```

Exercise 3: While purchasing certain items, a discount of 10% is offered if the quantity purchased is more than 1000. If quantity and price per item are input through the keyboard, write a program to calculate the total expenses.

Flowchart:



C source code:

Input:

```
//this code is written by SP23-BCS-040 on 1-04-2023
// to calculate the discount on a quantity
#include<stdio.h>
int main()
{
    int quan;
    float discount;
    int price_per_item;
    printf("Enter the quantity : ");
    scanf("%d", &quan);

    if(quan>1000){
        discount= 10.0; //set the discount to 10%
        printf("A discount of %.2f%% will be offered\n", discount); }
```

```

else
{
    discount=0.0; //set the discount to 0%
    printf("A discount of %.2f%% will not be offered\n", discount);
}
return 0;
}

```

Output:

```

Enter the quantity : 3000
A discount of 10.00% will be offered

Process returned 0 (0x0)   execution time : 9.569 s
Press any key to continue.

```

Exercise 4: A company insures its drivers in the following cases:

- – If the driver is married.
- – If the driver is unmarried, male & above 30 years of age.
- – If the driver is unmarried, female & above 25 years of age.
- In all other cases the driver is not insured. If the marital status, gender and age of the driver are the inputs, write a programme to determine whether the driver is to be insured or not

Hint: For marital status you may ask user to enter 0 for married and 1 for unmarried. You may ask user to enter 0 for male and 1 for female.

C source code:

Input:

```

// program is prepared by SP23-BCS-040 on 1-04-2023
//to calculate that driver is insured or not
#include<stdio.h>

int main()
{
    int gender,ms,age;
    printf("enter age,gender(1=female or 2=male),marital status(1=unmarried or 2= married):");
    scanf("%d%d%d",&gender,&age,&ms);
    if(ms==2)
    {printf("driver is insured\n");}
    else if(ms==1 && gender==2 && age>30)

```



```

{printf("driver is insured\n");}
else if(ms==1 && gender==1 && age>25)
{printf("driver is insured\n");}
else
    printf("driver is not insured\n");
return 0;
}

```

Output:

```

enter age,gender(1=female or 2=male),marital status(1=unmarried or 2= married):
40 2 1
driver is not insured

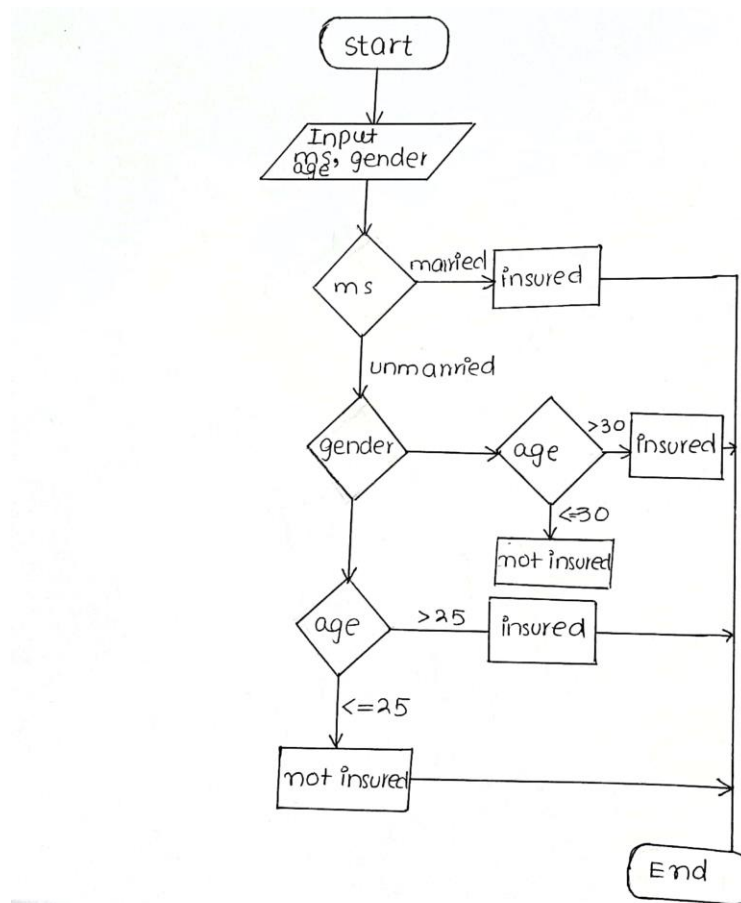
```

```

Process returned 0 (0x0)   execution time : 14.914 s
Press any key to continue.

```

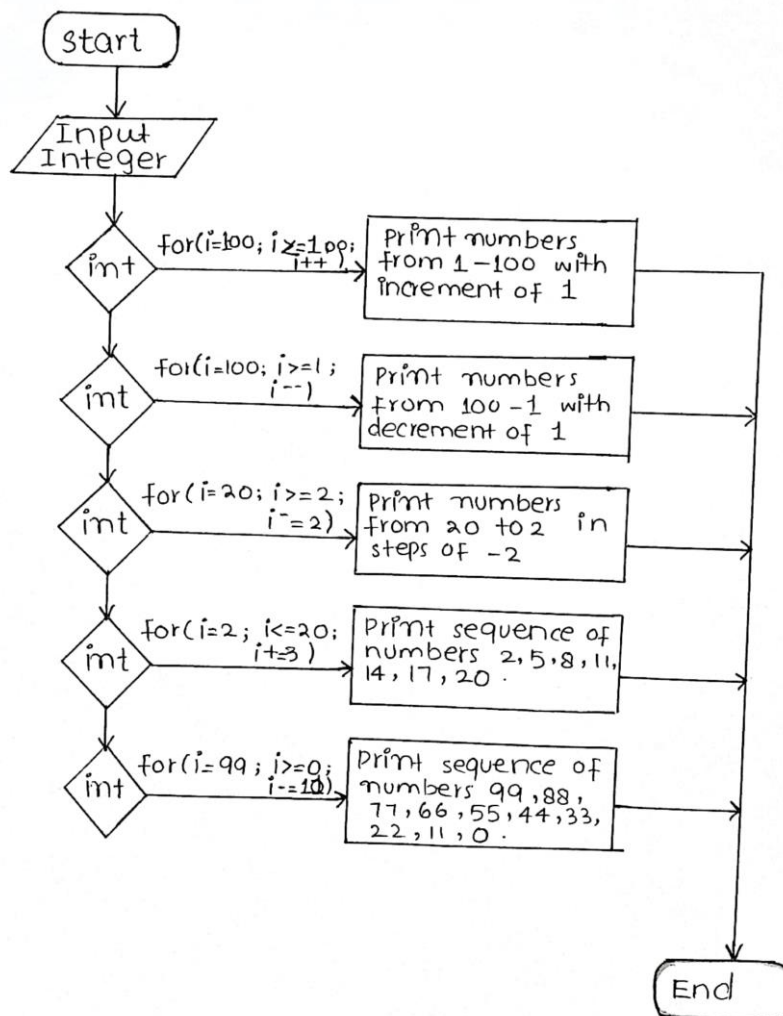
Flowchart:



Exercise 5: Print the following series using for loop

- Print numbers from 1 to 100 with increment of 1
- Print numbers from 100 to 1 with decrement of 1
- Print numbers from 20 to 2 in steps of -2
- Print sequence of numbers: 2, 5, 8, 11, 14, 17, 20
- Print sequence of numbers: 99, 88, 77, 66, 55, 44, 33, 22, 11, 0

Flowchart:



C source code:

Input:

```
// program is prepared by SP23-BCS-040 on 1-04-2023
// to calculate the number in sequence
#include<stdio.h>
int main()
{
    int i;

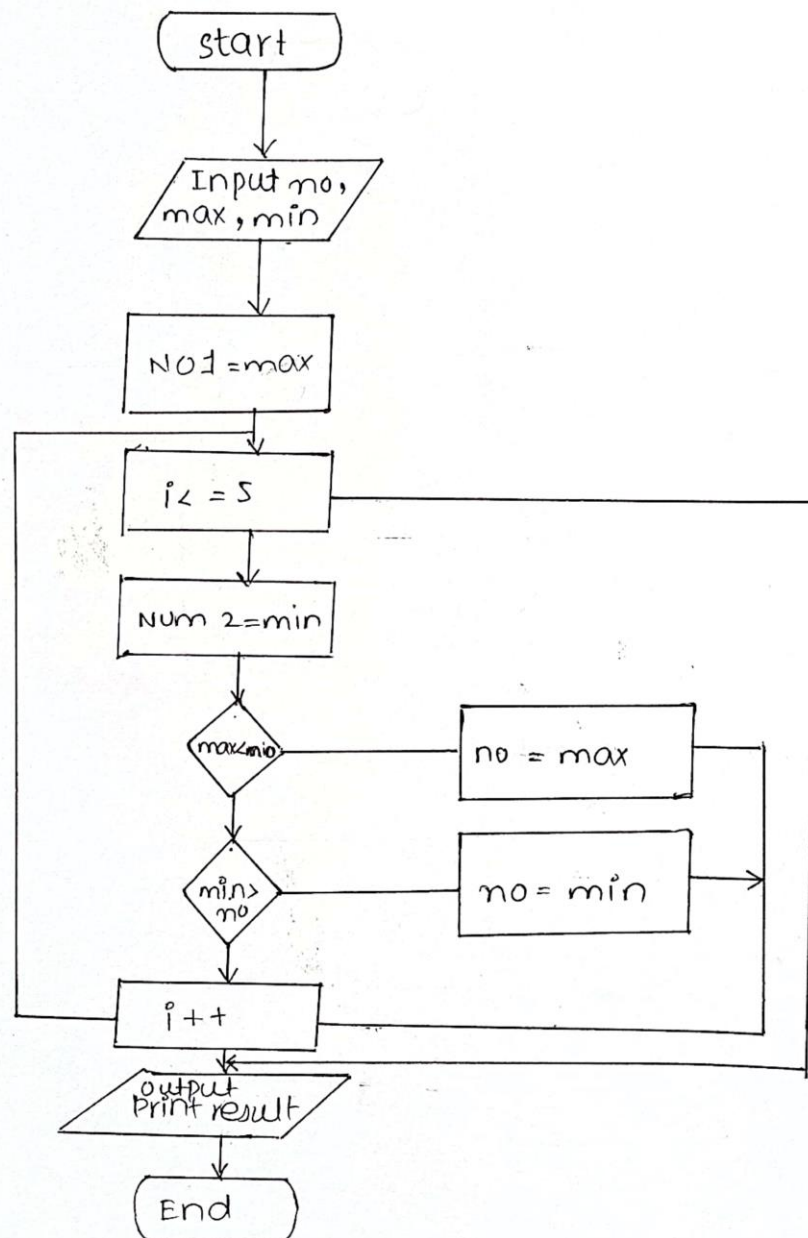
    printf("Print Numbers from 1 to 100 with increment of 1\n");
    for(i=1; i<=100; i++)
    {
        printf("%d ",i);
    }
    printf("\nPrint Numbers from 100 to 1 with decrement of 1\n");
    for(i=100; i>=1; i--)
    {
        printf("%d ",i);}
    printf("\nPrint Numbers from 20 to 2 in steps of -2\n");
    for(i=20; i>=2; i-=2)
    {
        printf("%d ",i);
    }
    printf("\nPrint sequence of numbers 2,5,8,11,14,17,20\n");
    for(i=2; i<=20; i+=3)
    {
        printf("%d ",i);
    }
    printf("\n print sequence of numbers 99,88,77,66,55,44,33,22,11,0\n");
    for(i=99; i>=0; i-=11)
    {
        printf("%d ",i);
    }
    return 0;
}
```

Output:

```
Print Numbers from 1 to 100 with increment of 1
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59
60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Print Numbers from 100 to 1 with decrement of 1
100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45
44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
Print Numbers from 20 to 2 in steps of -2
20 18 16 14 12 10 8 6 4 2
Print sequence of numbers 2,5,8,11,14,17,20
2 5 8 11 14 17 20
 print sequence of numbers 99,88,77,66,55,44,33,22,11,0
99 88 77 66 55 44 33 22 11 0
Process returned 0 (0x0)    execution time : 0.049 s
Press any key to continue.
```

Exercise 6: Write a program that reads in five integers and then determines and prints the largest and smallest integers in the group. Use loop to input the values from the user (Hint: use two of the variables to hold the current largest and smallest integers.)

Flowchart:



C source code:

Input:

```
// program is prepared by SP23-BCS-040 on 1-04-2023
// determine the largest and smallest integer in group
#include<stdio.h>
int main()
{
    int no, max, min;
    int i;
    printf("Enter 5 numbers : ");
    min=max=no;
    for(i=1; i<=5; i++){
        scanf("%d\n", &no);
        if(i==1){
            max=no;
            min=no;
        }

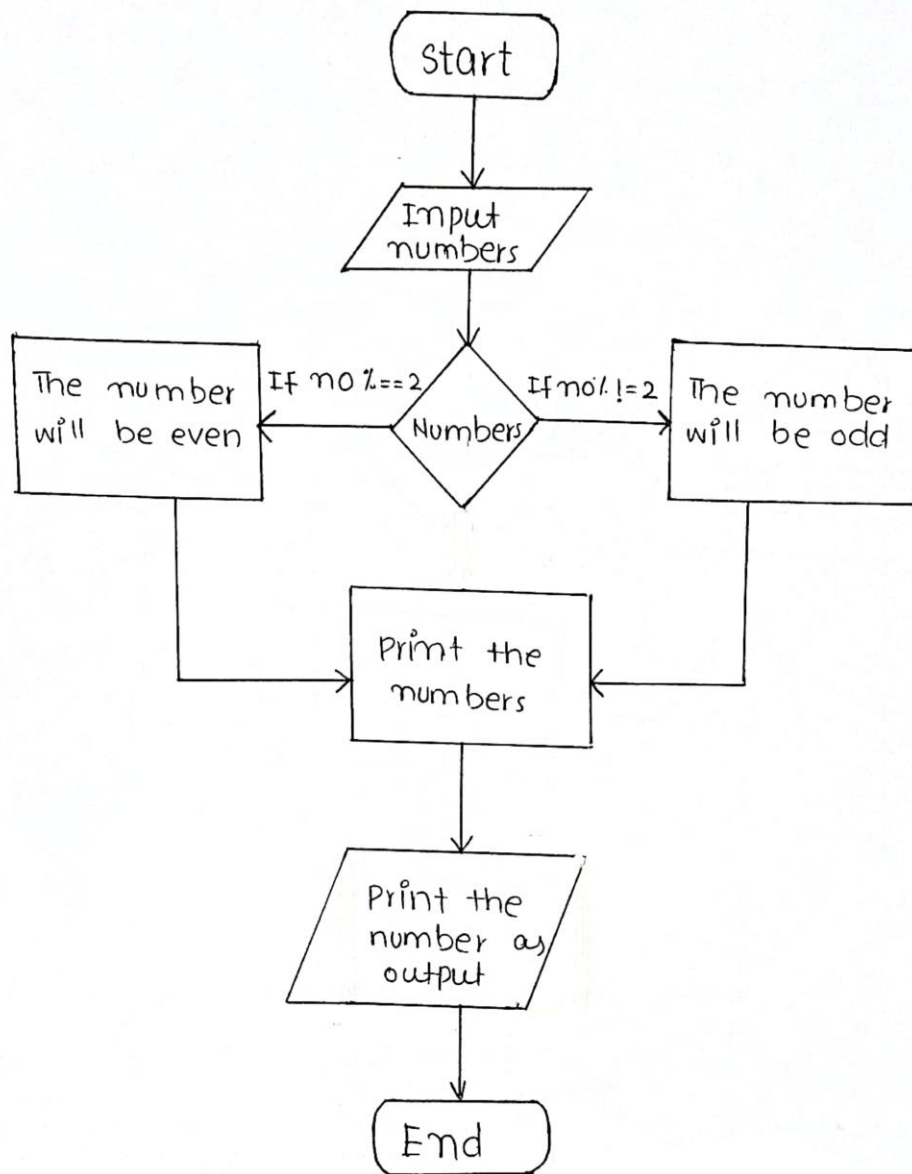
        if(no>max)
            max=no;
        if(no<min)
            min=no;
        printf("maximum no=%d\n", max);
        printf("minimum no=%d\n", min);
    }
    return 0;
}
```

Output:

```
Enter 5 numbers : 2 3 4 5 6
maximum no=2
minimum no=2
maximum no=3
minimum no=2
maximum no=4
minimum no=2
maximum no=5
minimum no=2
```

Exercise 7: Write a program that reads a number and determines and prints whether it is odd or even. (Hint: use the modulus operator. Any even number is multiple of two, and any multiple of two gives a remainder of zero when divided by two.)

Flowchart:



C source code:

Input:

```
// program is prepared by SP23-BCS-040 on 1-04-2023
// determine and print the even and odd integer
#include<stdio.h>
int main()

{
    int no;
    int even;
    int odd;
    printf("Enter number : ");
    scanf("%d", &no);
    if(no%2==0 ){
        printf("No is even\n");
    }
    else
    {
        printf("No is odd\n");
    }

    return 0;
}
```

Output:

```
Enter number : 6
No is even

Process returned 0 (0x0)   execution time : 4.275 s
Press any key to continue.
```

Exercise 8: Write a program which asks the user to enter 10 numbers and prints out the message “even” if the number is even and “divisible by three” if the number is divisible by three.

C source code:

Input:

// program is prepared by SP23-BCS-040 on 1-04-2023

//enter numbers and point out the message in even

```
#include<stdio.h>
int main()
{
    int no;
    printf("enter ten numbers:\n");
    for(int i=0; i<10; i++)
    {
        scanf("%d",&no);
    }
    if(no %2==0)
    {
        printf("even\n");
    }
    else if(no %3==0)
    {
        printf("divisible by 3\n");
    }
    else
    {
        printf("indivisible by 3 and not even\n");
    }
    return 0;
}
```

Output:

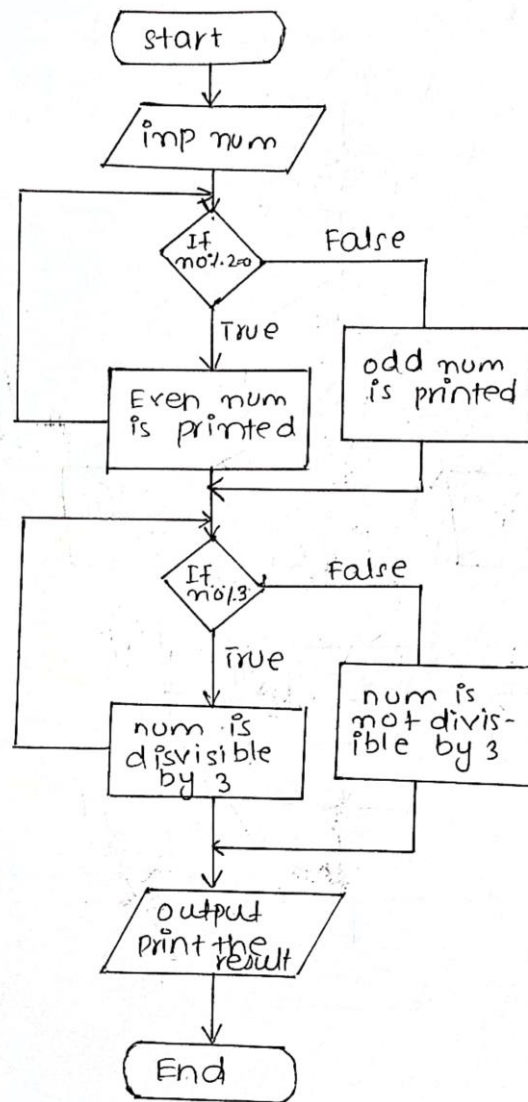
enter ten numbers:

1
2
3
4
5
6
7
8
9
0

even

Process returned 0 (0x0) execution time : 23.657 s
Press any key to continue.

Flowchart:



Exercise 9: A person invests \$1000.0 in a savings account yielding 5% interest. Assuming that all interest is left on deposit in the account, calculate and print the amount of money in the account at the end of each year for 10 years. Use the following formula for determining these amounts:

$$a = p(1+r)^n$$

where

p is the original investment(i.e. the principal)
r is the annual interest rate
n is the number of years
a is the amount on deposit at the end of the nth year.

Sample output

Year	Amount on deposit
1.	1050.00
2.	1102.50
3.	1157.63
4.	1215.51
5.	1276.28
6.	1340.10
7.	1407.10
8.	1477.46
9.	1551.33
10.	1628.89

C source code:

Input:

```
// program is prepared by SP23-BCS-040 on 1-04-2023
//, calculate and print the amount of money in the account
#include<stdio.h>
#include<math.h>
```

```
int main()
{

double amount;
double principal=1000.0;
double rate=0.05;

int year;
printf("%4s%21s\n","year","amount on deposit");
for(year=1;year<=10;year++)
{
amount=principal*pow(1.0+rate,year);
printf("%4d%21.2f\n",year,amount);
}

return 0;
}
```

Output:

year	amount on deposit
1	1050.00
2	1102.50
3	1157.63
4	1215.51
5	1276.28
6	1340.10
7	1407.10
8	1477.46
9	1551.33
10	1628.89

Process returned 0 (0x0) execution time : 4.186 s
Press any key to continue.