LOOP PROBLEMS SOLUTION

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BSCS IST (SS1)

(While loop Questions)

Problem 6.1

Write a program that displays "Pakistan" for five time using while loop

```cpp
#include<iostream>

using namespace std;

int main()

{

int i;

i=1;

while (i<=5 )

{

i++;

cout<<"Pakistan"<<endl;

}

return 0;

}
```

Problem 6.2

Write a program that displays counting from 1 to 10 using while loop.

```cpp
#include<iostream>

using namespace std;
```

```cpp
int main()

{

int i;

i=1;

while (i<=10 )

{

cout<<i<<endl;

i++;

}

return 0;

}
```

Problem 6.3

Write a program that displays first five numbers and their sums using while loop.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n=1,sum;

while (n<=5 )

{

cout<<n<<endl;

sum=sum+n;

n=n+1;

}

cout<<"sum is"<<sum<<endl;
```

```
return 0;

}
```

Problem 6.4

Write a program that displays first five numbers and their squares using while loop.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n=1;

while (n<=5 )

{

cout<<n<<"   "<<n*n<<endl;

n++;

}


return 0;

}
```

Problem 6.5

Write a program that inputs a number from user and display table of that number   using while loop.

```cpp
#include<iostream>

using namespace std;

int main()

{
```

```cpp
int n,j;

j=1;

cout<<"enter a number"<<endl;

cin>>n;

while (j<=10)

{

cout<<n<<"*"<<j<<"="<<j*n<<endl;

j=j+1;

}


return 0;

}
```

Problem 6.6

 Write a program that inputs a number from user and display sum of its digits using while loop.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n,sum;

sum=0;

cout<<"enter a number"<<endl;

cin>>n;

while (n!=0)

{

sum=sum+n%10;
```

n=n/10;

}

cout<<" sum of digits is"<<sum<<endl;

return 0;

}

Problem 6.7

Write a program that inputs a number from user and display factorial of that number using while loop.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n,fact,c;

c=1;

fact=1;

cout<<"enter a number"<<endl;

cin>>n;

while (c<=n)

{

fact=fact*c;

c=c+1;

}

cout<<" factorial of number is"<<fact<<endl;
```

```
return 0;

}
```

Problem 6.8

Write a program that displays degree to radian tabel using while loop.

```
#include<iostream>

using namespace std;

int main()

{

int degree;

double radian;

const double pie = 3.14;

cout<<"Degree to radians "<<endl;

while (degree<=360)

{

radian= (degree*pie)/180;

cout<<degree<<"    "<<radian<<endl;

degree += 10;


}


return 0;

}
```

Problem 6.9

Write the sum of following series using while loop.

1+1/2+1/4+1/6.....1/100

```cpp
#include<iostream>

using namespace std;

int main()

{

float c,sum;

c=2;

sum=1;

while (c<=100)

{

sum=sum+1.0f/c;

c=c+2;


}

cout<<"sum of series is"<<sum<<endl;

return 0;

}
```

Problem 6.10

Write a program that inputs a positive number.It then display sum of all even and odd number from 1 to the number entered by the user.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n,oddsum=0,evensum=0;
```

```cpp
cout<<"enter a number"<<endl;

cin>>n;

while (n>=0)

{

if(n%2==0)

evensum=evensum+n;

else

oddsum=oddsum+n;

n--;

}

cout<<"sum of even is"<<evensum<<endl;

cout<<"sum of odd is"<<oddsum<<endl;


return 0;

}
```

Problem 6.11

Write a program that inputs a   number.It then check whether it is an Armstrong Number or not.


```cpp
#include<iostream>

using namespace std;

int main()

{

int num,n,r,sum;

cout<<"enter a number"<<endl;

cin>>n;
```

```
num=n;

sum=0;

while (n!=0)

{

r=n%10;

sum=sum+(r*r*r);

n/=10;

}

if (sum==num)

cout<<num<<" is an Armstrong Number "<<endl;

else

cout<<num<<" is not an Armstrong Number "<<endl;

return 0;

}
```

Problem 6.12

Write a program that inputs a positive number until a user enters negative number. Program then calculates average, and display maximum and minimum from the numbers entered by the user.

```
#include<iostream>

using namespace std;

int main()

{

int n,max,min,count;

float sum,average;

char choice;
```

```cpp
cout<<"enter a number"<<endl;

cin>>n;

max=n;

min=n;

sum=0.0f;

while (n>=0)

{

sum=sum+n;

count++;

average =sum/count;

if (n>=max)

max=n;

if (n<=min)

min=n;

cout<<"do you want to enter more numbers 'Y'/ 'N' "<<endl;

cin>>choice;

if (choice=='Y' || choice=='y')

cout<<"enter a positive number"<<endl;

cin>>n;

if (choice=='N' || choice=='n')

{

break;

}

}

cout<<max<<"is maximum number"<<endl;

cout<<min<<"is minimum number"<<endl;
```

cout<<average<<"is average of numbers"<<endl;

return 0;

}

Problem 6.14

Write a program that inputs starting and ending number from user. And it then display even numbers In given range using while loop.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n,s,e;

cout<<"enter starting number"<<endl;

cin>>s;

cout<<"enter ending number"<<endl;

cin>>e;

n=s;

while (n<=e)

{

if (n%2==0)

cout<<n<<endl;

n++;

}

return 0;

}
```

Problem 6.15

Write a program using while loop that inputs a number from user and then display it. loop is terminated when user enter -1.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n;

n=1;

while (n!=-1)

{

cout<<"enter    number "<<endl;

cin>>n;

cout<<"you Entered "<<n<<endl;

}

cout<<"end of program"<<endl;

return 0;

}
```

Problem 6.16

Write a program that inputs a number from user and display n Fibonacci terms.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n,b,next,a, count;
```

```cpp
cout<<"enter number of Fibonacci series"<<endl;

cin>>n;

a=0;

b=1;

cout<<"Fibonacci series"<<endl;

cout<<a<<"\t"<<b<<endl;

count =2;

while (count<n)

{

next=a+b;

cout<<"\t"<<next;

count++;

a=b;

b=next;

}

return 0;

}
```

Problem 6.17

Write a program that enters a number and check whether it is a Fibonacci number or not.

```cpp
#include<iostream>

using namespace std;

int main()

{

int a,b,n,next;
```

```cpp
cout<<"enter the number"<<endl;

cin>>n;

if ((n==0 ) ||(n==1))

cout<<n<<"is a Fibonacci number"<<endl;

else

a=0;

b=1;

next=a+b;

while (next<n)

{

a=b;

b=next;

next=a+b;

}

if (next==n)

cout<<n<<" is a Fibonacci number"<<endl;

else

cout<<n<<" is not a Fibonacci number"<<endl;

return 0;

}
```

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(For loop Questions)

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Problem 6.23

Write a program that inputs counting from 1 to 5 using for loop.


```cpp
#include<iostream>

using namespace std;
```

```
int main()

{

for (int i=1; i<=5 ; i++)

cout<<i<<endl;

return 0;

}
```

Problem 6.24

Write a program that displays product of all odd numbers from 1 to 10 using for loop.

```
#include<iostream>

using namespace std;

int main()

{

long int oddproduct=1;

for (int i=1; i<=10 ; i=i+2)

{

oddproduct=oddproduct*i;

cout<<oddproduct <<endl;


}

return 0;

}
```

Problem 6.25

Write a program that inputs   table number and length of table using for loop.

```
#include<iostream>
```

```cpp
using namespace std;

int main()

{

int n,l;

cout<<"enter a number for table"<<endl;

cin>>n;

cout<<"enter length of the table "<<endl;

cin>>l;

for (int i=1; i<=l; i++)

cout<<n<<" * "<< i << "=" << n*i<<endl;

return 0;

}
```

Problem 6.26

Write a program that find the sum of squares of integers from 1 to n.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n,c,sum;

sum=0;

cout<<"enter a number"<<endl;

cin>>n;

for ( c=1; c<=n ; c++)

sum=sum+(c*c);

cout<<"sum is"<<sum<<endl;
```

```
return 0;

}
```

Problem 6.27

Write a program that inputs a number from user and prints the lowest and highest digit of the number.

```cpp
#include<iostream>

using namespace std;

int main()

{

int num,n;

cout<<"enter a number"<<endl;

cin>>n;

num=n;

int high=n%10, low=n%10, rem;

n=n/10;

for (int i=n; i>=1 ;i=i/10)

{

rem=i%10;

if (rem>high)

high=rem;

if (rem<low)

low=rem;

}

cout<<"the highest digit of "<<num<<" is "<<high<<endl;

cout<<"the lowest digit of "<<num<<" is "<<low<<endl;
```

```
return 0;

}
```

Problem 6.29

Write a program to print the following series.

1,4,7,........40.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n=1;

cout<<"the series is as follows"<<endl;

for (int i=1; n<=40; i++)

{


cout<<n<<"   ";

n=n+3;

}

return 0;

}
```

Problem 6.30

Write a program to print the following series.

1,-4,7,-10,......-40

```cpp
#include<iostream>

using namespace std;

int main()

{

int n=1,p;

cout<<"the series is as follows"<<endl;

for (int i=1; n<=40; i++)

{

if (i%2==0)

{

p=-n;

cout<<p<<"   ";

}

else

cout<<n<<"   ";

n=n+3;

}

return 0;

}
```

Problem 6.32

Write a program that inputs an integer and print if it is prime or composite.

```cpp
#include<iostream>

using namespace std;

int main()

{
```

```cpp
int num,c, prime =1;

cout<<"enter a number "<<endl;

cin>>num;

for (c=2; c<=num/2; c++)

if (num%c==0)

{

prime =0;

break;

}

if (prime ==1)

cout<<num<<" is a prime number"<<endl;

else

cout<<num<<" is a composite number"<<endl;

return 0 ;

}
```

Problem 6.31

Write a program that inputs a number and check whether it is perfect number or not.

```cpp
#include<iostream>

using namespace std;

int main()

{

int num, mid,sum=0;

cout<<"enter a number "<<endl;

cin>>num;

mid=num/2;
```

```cpp
for (int i=1; i<=mid; i++)

{

if ((num%i)==0)

sum=sum+i;

}

if (sum==num)

cout<<num<<"is a perfect number";

else

cout<<num<<"is not a perfect number";

return 0;

}
```

(Nested Loop Questions)

Problem 6.37

Write a program that displays product components of a number without repeating them
.

```cpp
#include<iostream>

using namespace std;

int main()

{

int n,s;

cout<<"enter the number"<<endl;

cin>>n;

cout <<"product components of number "<<n<<" are "<<endl;

for (int i=n; i>=s; i--)

for (int j=1; j<=n ; j++)
```

```
{

if (i*j==n)

{

cout<<i<<"*"<<j<<"="<<i*j<<endl;

s=j+1;

}

}

return 0;

}
```

Problem 6.38

Write a program to print the following series.

1=1

1+2=3

1+2+3=6

1+2+3+4=10

1+2+3+4+5=15


```
#include<iostream>

using namespace std;

int main()

{

int sum;

for (int i=1; i<=5 ; i++)

{

cout<<"1";
```

```cpp
sum=1;

for (int j=2; j<=i; j++)

{

cout<<"+"<<j;

sum=sum+j;

}

cout<<"="<<sum<<endl;

}


return 0;

}
```

Problem 6.39

Write a program that inputs height of triangle and displays a triangle of characters.e.g if users enter 5 it displays following output.

A

B C

D E F

G H I J

K L M N O


```cpp
#include<iostream>

using namespace std;

int main()

{

int h;

char ch='A';
```

```
cout<<"enter height of triangle"<<endl;

cin>>h;

for (int i=1; i<=5 ; i++)

{

for (int j=1; j<=i; j++)

{

cout<<ch<<"   ";

ch++;

}

cout<<endl;

}

return 0;

}
```

Problem 6.40

Write a program to print following shape using nested loops. The outer loop should be for loop and inner loop should be while loop .

***

**

***

**

*

**

*

```
#include<iostream>

using namespace std;

int main()
```

```
{
int j;
for (int i=1; i<=7 ; i++)
{
j=i;
while (j<=7)
{
cout<<"*";
j++;
}
cout<<endl;
}
return 0;
}
```

(Additional question)

12345

1234

123

12

1

```
#include<iostream>
using namespace std;
int main()
{
for (int i=5; i>=1; i--){
{
```

```cpp
for (int j=1; j<=i; j++)

cout<<j;


}

cout<<endl;}

return 0;

}
```