



**ARITHMETIC
AND
GEOMETRIC
PROGRESSION**

By DJVprogrammers

Write a program to Find terms of Arithmetic and geometric progression using 1st term and common difference or common ratio using recursion in C++.

```
//Find Arithmetic and geometric progression
```

```
#include<iostream>
```

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

```
#include<conio.h>
```

```
using namespace std;
```

```
int geometric(int r, int a0,int nn)
```

```
{
```

```
    if(nn==0)
```

```
        return 1;
```

```
    else
```

```
{
```

```
    cout<<a0*pow(r,geometric(r,a0,nn-1))<<" ";
```

```
    return nn+1;
```

```
}
```

```
}
```

```
int arithmetic(int d,int a0,int nn)
```

```
{
```

```
    if(nn==0)
```

```
        return 1;
```

```
        else

    {

    cout<<a0+ (arithmetic(d,a0,nn-1))*d<<" ";

    return nn+1;

    }

}

int main()

{

    int ch,a0,r,d,n;

    cout<<"What you want to find \n\n";

    cout<<"1-Arithmetic Sequence \n";

    cout<<"2-Geometric Sequence \n";

    cin>>ch;

    switch(ch)

    {

        case 1:

            cout<<"===== \n";

            cout<<"\tArithmetic Progression\n";

            cout<<"===== \n";
```

```
cout<<"Enter 1st term of the sequence \t";  
  
cin>>a0;  
  
cout<<"Enter Difference \t";  
  
cin>>d;  
  
cout<<"How many terms you want to find \t";  
  
cin>>n;  
  
cout<<endl;  
  
arithmetic(d,a0,n);  
  
break;
```

case 2:

```
cout<<"\n===== \n";  
  
cout<<"\tGeometric Progression\n";  
  
cout<<"===== \n";  
  
cout<<"\nEnter 1st term of the sequence \t";  
  
cin>>a0;  
  
cout<<"Enter Common Ratio \t";  
  
cin>>d;  
  
cout<<"How many terms you want to find \t";  
  
cin>>n;  
  
cout<<endl;
```

```
        geometric(d,a0,n);

        break;

    default:

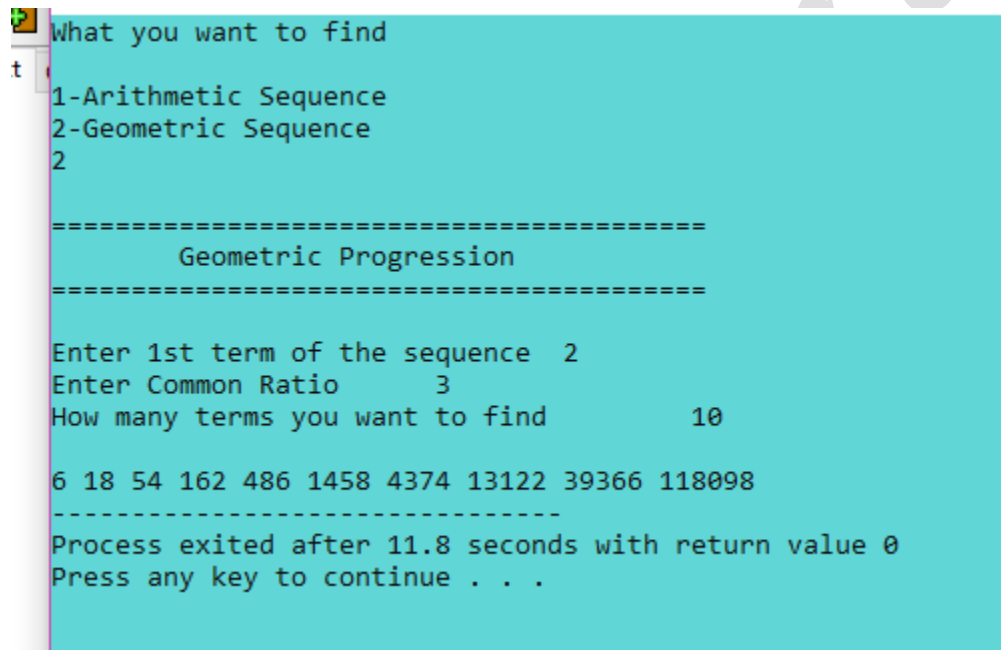
        cout<<"Invalid choice :( ";

    }

    getch();

    return 0;

}
```



The screenshot shows the output of a C++ program. It starts with a prompt "What you want to find" and a menu with two options: "1-Arithmetic Sequence" and "2-Geometric Sequence". Option 2 is selected. The program then displays "Geometric Progression" with a decorative border. It prompts for the first term (2), common ratio (3), and number of terms (10). The output shows the sequence: 2, 6, 18, 54, 162, 486, 1458, 4374, 13122, 39366, 118098. The program then displays "Process exited after 11.8 seconds with return value 0" and "Press any key to continue . . .".

```
What you want to find
t
1-Arithmetic Sequence
2-Geometric Sequence
2

=====
      Geometric Progression
=====

Enter 1st term of the sequence  2
Enter Common Ratio             3
How many terms you want to find      10

6 18 54 162 486 1458 4374 13122 39366 118098
-----
Process exited after 11.8 seconds with return value 0
Press any key to continue . . .
```

Write a program to Check if the sequence is Arithmetic or geometric 1st term and 3 consecutive terms and if it is one of them then print 10 terms of that sequence in C++.

//check if the it is geometric and arithmetic progression

```
#include<iostream>
```

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

```
#include<conio.h>
```

```
using namespace std;
```

```
int geometric(int r, int a0,int nn)
```

```
{
```

```
    if(nn==0)
```

```
        return 1;
```

```
    else
```

```
{
```

```
    cout<<a0*pow(r,geometric(r,a0,nn-1))<<" ";
```

```
    return nn+1;
```

```
}
```

```
}
```

```
int arithmetic(int d,int a0,int nn)
```

```
{
```

```
        if(nn==0)

        return 1;

        else

    {

    cout<<a0+ (arithmetic(d,a0,nn-1))*d<<" ";

    return nn+1;

    }

}

int main()

{

    int ch,a0,r,d,n;

    cout<<"Enter 1st term of a Sequence\n";

    cin>>a0;

    cout<<"Enter any 3 consecutive terms "<<endl;

    int n1,n2,n3;

    cin>>n1>>n2>>n3;

    if(n2-n1==n3-n2)

    {

        cout<<"=====\\n";

        cout<<"\tArithmetic Progression\\n";
```

```
        cout<<"=====\\n";

        cout<<"1st term of the sequence is\\t"<<a0;

        cout<<"\\nCommon Difference is\\t"<<n2-n1;

        cout<<"\\n1st 10 terms are \\t\\n\\n"<<a0<<" ";

        arithmetic(n2-n1,a0,10);

    }

    else if(n2/n1==n3/n2)

    {

        cout<<"\\n=====\\n";

        cout<<"\\tGeometric Progression\\n";

        cout<<"=====\\n";

        cout<<"\\n1st term of the sequence is\\t"<<a0;

        cout<<"\\nCommon Ratio is\\t"<<n2/n1;

        cout<<"\\n1st 10 terms are \\t\\n\\n"<<a0<<" ";

        geometric(n2/n1,a0,10);

    }

    else

    {

        cout<<"It is neither Arithmetic nor Geometric progression "<<endl;
```

```
}  
  
    getch();  
  
    return 0;  
  
}
```

```
Enter 1st term of a Sequence  
3  
Enter any 3 consecutive terms  
6  
9  
12  
=====  
          Arithmetic Progression  
=====  
1st term of the sequence is      3  
Common Difference is      3  
1st 10 terms are  
  
3 6 9 12 15 18 21 24 27 30 33  
-----  
Process exited after 6.251 seconds with return value 0  
Press any key to continue . . .
```

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