Question # 1:

You are asked to write a c++ program in which a user wants to convert the binary numbers to decimal. The user should be allowed input the digits of binary in reversed order. The input will terminate on -1. The -1 will not be the part of binary input. Finally, you have to print the decimal number.

Input: Enter the binary digit 0: 0

Enter the binary digit 1: 1

Enter the binary digit 2: 0

Enter the binary digit 3: 1

Enter the binary digit 4: -1

Output: The decimal number is: 10

For this given sample example, see the binary digits are in reversed order like 0101. The actual binary should be 1010 and its equivalent decimal number is 10.

Question # 2:

You are asked to write a c++ program in which a user enter a series of numbers and this input will end on -9999. User wants to know that the series which he has given input is Arithmetic series, Geometric series or Fibonacci series. The program will have at least three valid values as input. Your program will check on every pair of consecutive values whether the pair follow rules for any of above-mentioned series or not. At the end of input, you will mention that these numbers belong to which series. Or you will say these numbers do not belong to any of these series.

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| --- | --- | --- |
| Rules for Arithmetic series:  an=a1+(n-1)d  an=the nᵗʰ term in the sequence  a1=the first term in the sequence  d=the common difference between terms  So, if the difference between any pair of values is not same as the first pair had, then this series is not arithmetic. | Rules for Geometric series:  an=a1rn-1  an=the nᵗʰ term in the sequence  a1=the first term in the sequence  r=the common ratio between terms  So, if the ratio between any pair of values is not same as the first pair had, then this series is not geometric. | Rules for Fibonacci series:  an = an-1 + an-2  an=the nᵗʰ term in the sequence  an-1=the first previous term in the sequence from nth term  an-2= the second previous term in the sequence from nth term  So, if this rule is violated for any pair, then this series is not Fibonacci. |

Input: Enter the values of series: -11 2 15 28 -9999

Output: The series is arithmetic

Input: Enter the values of series: -4 -16 -64 -256 -9999

Output: The series is geometric

Input: Enter the values of series: 1 1 2 3 -9999

Output: The series is Fibonacci

Input: Enter the values of series: 1 4 3 43 -9999

Output: This not a series

Question # 3:

You are asked to write a c++ program in which a user enters the height of Pascal’s triangle. And the triangle is printed.

Pascal’s triangle is a triangular array of the binomial coefficients. Number of entries in every line is equal to line number. For example, the first line has “1”, the second line has “1 1”, the third line has “1 2 1”,.. and so on. Every entry in a line is value of a Binomial Coefficient. The value of ith entry in line number line is C(line, i). The value can be calculated using following formula.

C (line, i) = line! / ((line-i)! \* i!)

Input: Enter the height pascal’s triangle: 6

Output:

1

1 1

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1