1. Group Activity

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Problem: Building blocks

Step 1: Decomposition

Let’s split into five rows.

Row 1-> AAAAA AAAAA

Row 2-> AAAA AAAA

Row 3-> AAA AAA

Row 4-> AA AA

Row 5-> A A

Step 2: Pattern recognition

Finding similarities between things

Row 1-> 5A+1 Space+5A

Row 2-> 4A+3Space+4A

Row 3-> 3A+5Space+3A

Row 4-> 2A+7Space+2A

Row 5-> 1A+9Space+1A

Step 3: Abstraction

n=5, space=1

In row1 first we print n\*A then space\*” ”. then again print n\*A

In row2 we print (n-1) \*A then space+2\*” ” then (n-1) \*A

In row3 we print (n-2) \*A then space+4\*” ” then (n-2) \*A

In row4 we print (n-3) \*A then space+6\*” ” then (n-3) \*A

In row5 we print (n-4) \*A then space+8\*” ” then (n-4) \*A

Step 4: Algorithm

* Declare n=5 and space=1
* i denotes row and j denotes column
* We create two for loops for I and j
* Assign i=n and j=2n+K
* Print n\*A+ space\*””+ n\*A
* Decrement n by 1 and increment space by 2. Repeat the steps until the statement will satisfy
* Finally, we got our pattern.

1. Individual activity

Find the sum of all the array elements and then average value of the array elements

Step 1: Decomposition

Elements of the array -> 10 20 30 40 50

Step 2: Pattern recognition

First, we should add all the elements on by one.

10+20=30

30+30=60

60+40=100

100+50=150

Step 3: Abstraction

Sum=150

We should find the average of array elements

Average=sum/size=150/5=30.

Step 4: Algorithm

* Declare size=5 and sum=0
* Pass the array elements
* Create a for loop, assign i=0 to size-1
* Add all the elements one by one and consider as it sum (sum=sum+ array[i])
* Print the sum
* We should find the average, average=sum/size
* Print average.

Code:

#include<iostream>

Using namespace std;

double average (int a[],int size)

{

int sum=0;

for(int i=0;i<size;i++){

sum=sum+a[i];

}

cout<<sum<<endl;

int Average=sum/size;

cout<<Average<<endl;

}

int main()

{

int arr[]={10,20,30,40,50};

Int size=sizeof(arr)/sizeof(arr[0]);

Average(arr,size);

Return 0;

}

1. Code Challenge

Pascal triangle:

Code:

Rows=4

#include<iostream>

Using namespace std;

Int main()

{

int rows;

cout<<”enter the number of rows”;

cin>>rows;

cout<<endl;

for(int i=0;i<rows;i++)

{

int val=1;

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

{

cout<<” ”;

}

for(int k=0;k<=i;k++)

{

cout<<” “<<val;

Val=val\*(i-k)/(k+1);

}

cout<<endl<<endl;

cout<<endl;

return 0;

}