Competitive Programming

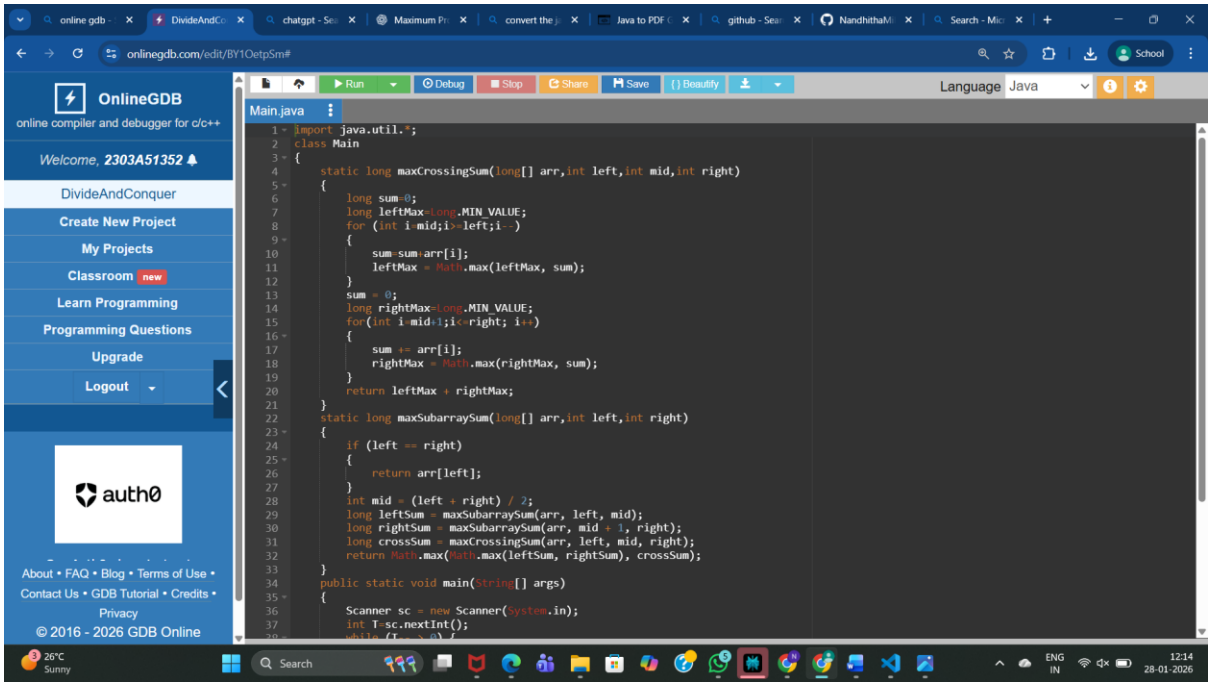
Week1-Assignment-3(Wednesday)

Assignment 3: Maximum Profit Streak (Divide and Conquer)

Code:

```
import java.util.*;
class Main
{
   static long maxCrossingSum(long[] arr,int left,int mid,int right)
   {
      long sum=0;
      long leftMax=Long.MIN_VALUE;
      for (int i=mid;i>=left;i--)
      {
         sum=sum+arr[i];
         leftMax = Math.max(leftMax, sum);
      }
      sum = 0;
      long rightMax=Long.MIN_VALUE;
      for(int i=mid+1;i<=right; i++)
      {
         sum += arr[i];
         rightMax = Math.max(rightMax, sum);
      }
      return leftMax + rightMax;
   }
   static long maxSubarraySum(long[] arr,int left,int right)
```

```
  {
    if (left == right)
    {
      return arr[left];
    }
    int mid = (left + right) / 2;
    long leftSum = maxSubarraySum(arr, left, mid);
    long rightSum = maxSubarraySum(arr, mid + 1, right);
    long crossSum = maxCrossingSum(arr, left, mid, right);
    return Math.max(Math.max(leftSum, rightSum), crossSum);
  }
  public static void main(String[] args)
  {
    Scanner sc = new Scanner(System.in);
    int T=sc.nextInt();
    while (T-- > 0) {
      int N=sc.nextInt();
      long[] arr = new long[N];
      for (int i=0;i<N;i++)
      {
        arr[i] = sc.nextLong();
      }
       System.out.println(maxSubarraySum(arr, 0, N - 1));
    }
    sc.close();
  }
}
```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Language Java
Main.java
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{
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{
long sum=0;
long leftMax=Long.MIN_VALUE;
for (int i=mid;i>=left;i--)
{
sum=sum+arr[i];
leftMax = Math.max(leftMax, sum);
}
sum = 0;
long rightMax=Long.MIN_VALUE;
for(int i=mid+1;i<=right; i++)
{
sum += arr[i];
rightMax = Math.max(rightMax, sum);
}
return leftMax + rightMax;
}
static long maxSubarraySum(long[] arr,int left,int right)
{
if (left == right)
{
return arr[left];
}
int mid = (left + right) / 2;
long leftSum = maxSubarraySum(arr, left, mid);
long rightSum = maxSubarraySum(arr, mid + 1, right);
long crossSum = maxCrossingSum(arr, left, mid, right);
return Math.max(Math.max(leftSum, rightSum), crossSum);
}
public static void main(String[] args)
{
Scanner sc = new Scanner(System.in);
int T=sc.nextInt();
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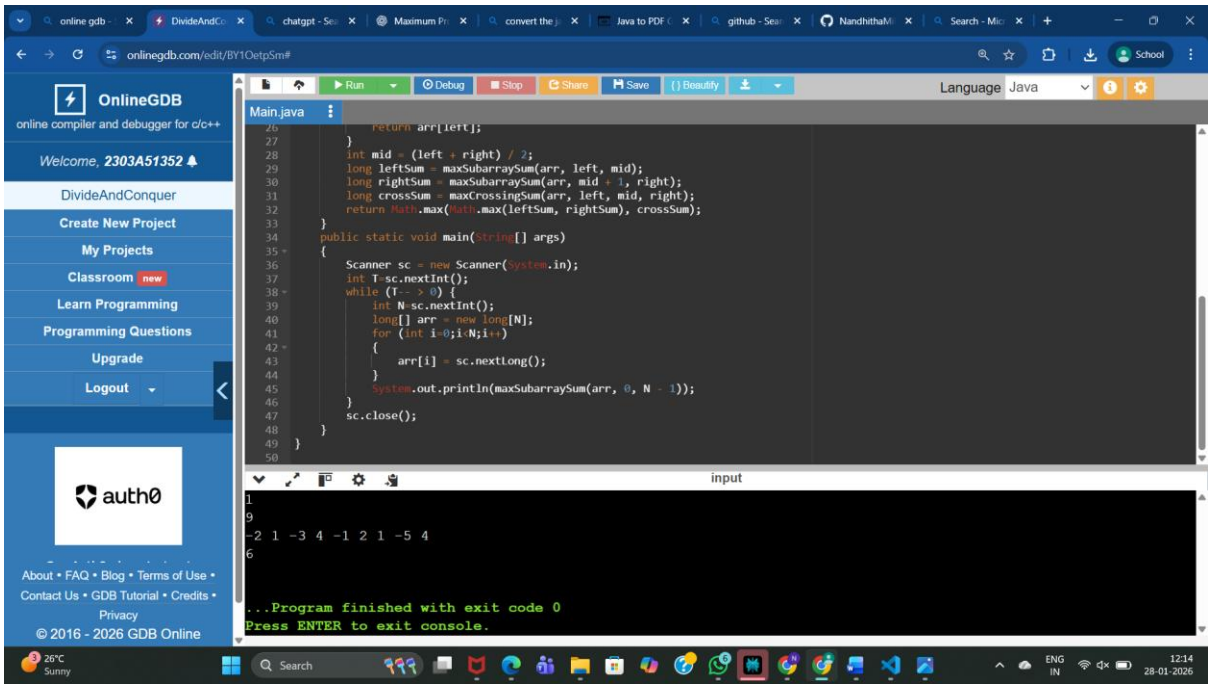
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while (T-- > 0) {
int N=sc.nextInt();
long[] arr = new long[N];
for (int i=0;i<N;i++)
{
arr[i] = sc.nextLong();
}
System.out.println(maxSubarraySum(arr, 0, N - 1));
}
sc.close();
}
}
input
1
9
-2 1 -3 4 -1 2 1 -5 4
6
...Program finished with exit code 0
Press ENTER to exit console.
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