WORKSHEET 1

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Branch: CSE
Section: 903-A MM

1. Fire and Ice

Program Code:

```
#include <stdio.h> #include<inttypes.h> void
multiply(uint64_t F[2][2], uint64_t M[2][2],uint64_t k); void
power(uint64_t F[2][2], uint64_t n,uint64_t k); uint64_t
fib(uint64_t n,uint64_t k)
{
  uint64_t F[2][2] = {{1,1},{1,0}};
  if (n == 0)
return 0;
power(F, n-1,k);
return F[0][0];
}
void power(uint64_t F[2][2], uint64_t n,uint64_t k)
{
  if( n == 0 || n == 1)
      return;
  uint64_t M[2][2] = {{1,1},{1,0}};
power(F, n/2,k);   multiply(F, F,k);
if (n%2 != 0)      multiply(F, M, k);
}
void multiply(uint64_t F[2][2], uint64_t M[2][2],uint64_t k)
{   uint64_t x =  (F[0][0]*M[0][0] +
F[0][1]*M[1][0])%k;   uint64_t y =  (F[0][0]*M[0][1] +
F[0][1]*M[1][1])%k;   uint64_t z =  (F[1][0]*M[0][0] +
```

```
F[1][1]*M[1][0])%k;   uint64_t w =  (F[1][0]*M[0][1]
+ F[1][1]*M[1][1])%k;
  F[0][0] = x;
  F[0][1] = y;
  F[1][0] = z;
  F[1][1] = w;
}
int main()
{   uint64_t n,k,t;
scanf("%llu",&t);
  while(t--)
  {
   scanf("%llu",&n);
scanf("%llu",&k);
   printf("%llu\n", (2*fib(n,k))%k);
  }
return 0;
}
```

Output:

2. Gold Mining

Program Code:

```
#include <iostream> using
namespace std;
int main() {
 int t;
 scanf("%d", &t);  while(t--)
 {
    int n, x, y;
    scanf("%d %d %d", &n, &x, &y);

    int sum = 0;
    for(int i=0; i<=n; i++)
    {
       sum+=y;
    }

    if(sum<x)
    {
       printf("NO\n");
    }
else
{
       printf("YES\n");
    }
 }  return
0;
}
```

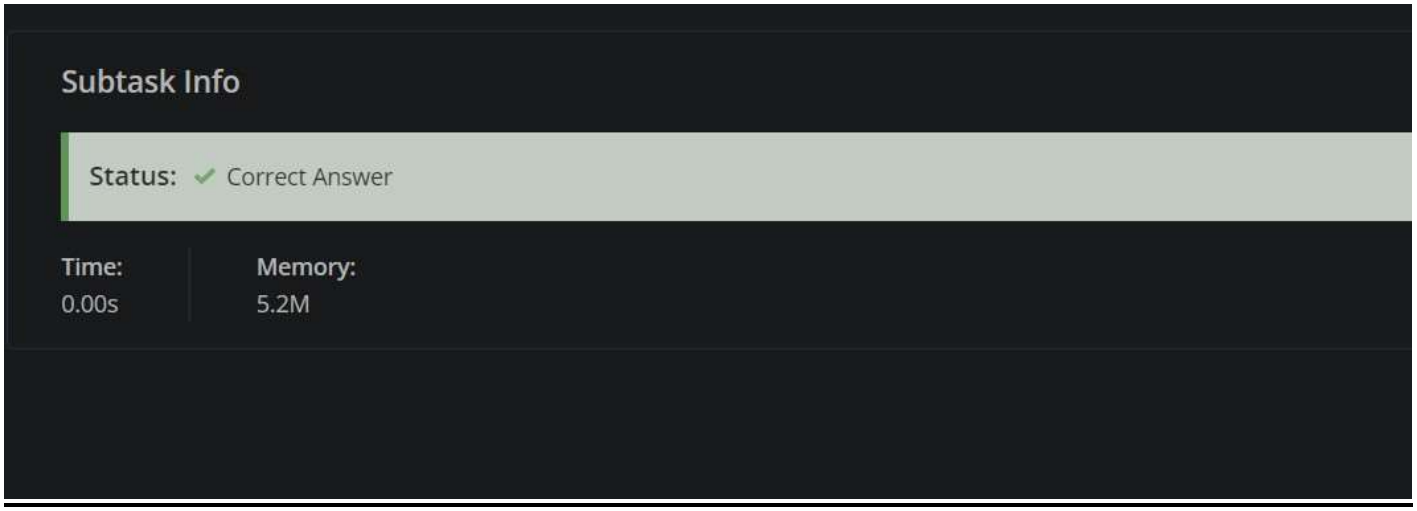
Output

3. The Lead Game

Program Code:

```
#include<bits/stdc++.h>
using namespace std;
typedef long long int lli;
int main(){     int
t,S=0,T=0;     cin>>t;
vector<int> v;
while(t--){        int s,t;
      cin>>s>>t;
S+=s; T+=t;
      v.push_back(S-T);
   }
   int max=-1,win;
for(int i:v){
if(abs(i)>max){
max=abs(i);
if(i>0) win = 1;
else win = 2;
       }  }
   cout<<win<<' '<<max;
}
```

Output



4. Sums in a triangle

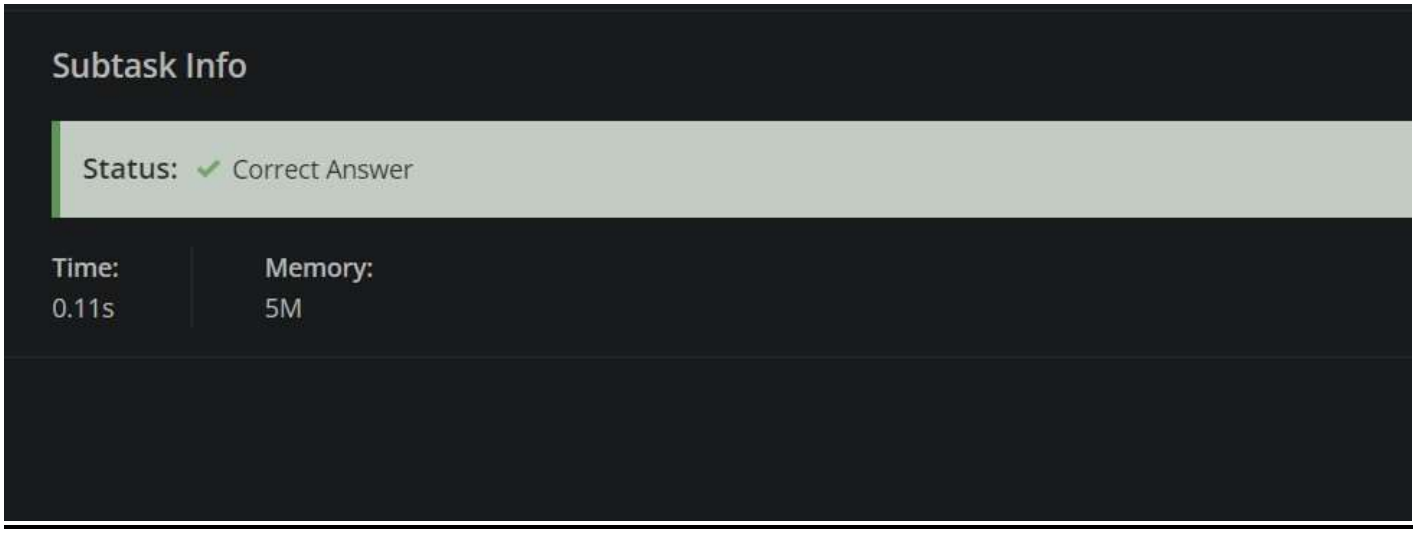
Program Code:

```
#include<bits/stdc++.h
> using namespace std;
int main(){
   int i,j,t,n;     cin>>t;
while(t--){         cin>>n;
int a[n][n];        for(int
i=0;i<n;i++){
for(j=0;j<=i;j++){
cin>>a[i][j];
          }
       }
       for(int i=n-2;i>=0;i--){
for(j=0;j<=i;j++){
             if((a[i][j]+a[i+1][j])>(a[i][j]+a[i+1][j+1]))
                   a[i][j]=a[i][j]+a[i+1][j];
else
                a[i][j]=a[i][j]+a[i+1][j+1];

          }
```

```
        }
        cout<<a[0][0]<<endl;
    }
return 0;
}
```

Output



5. Small Factorials

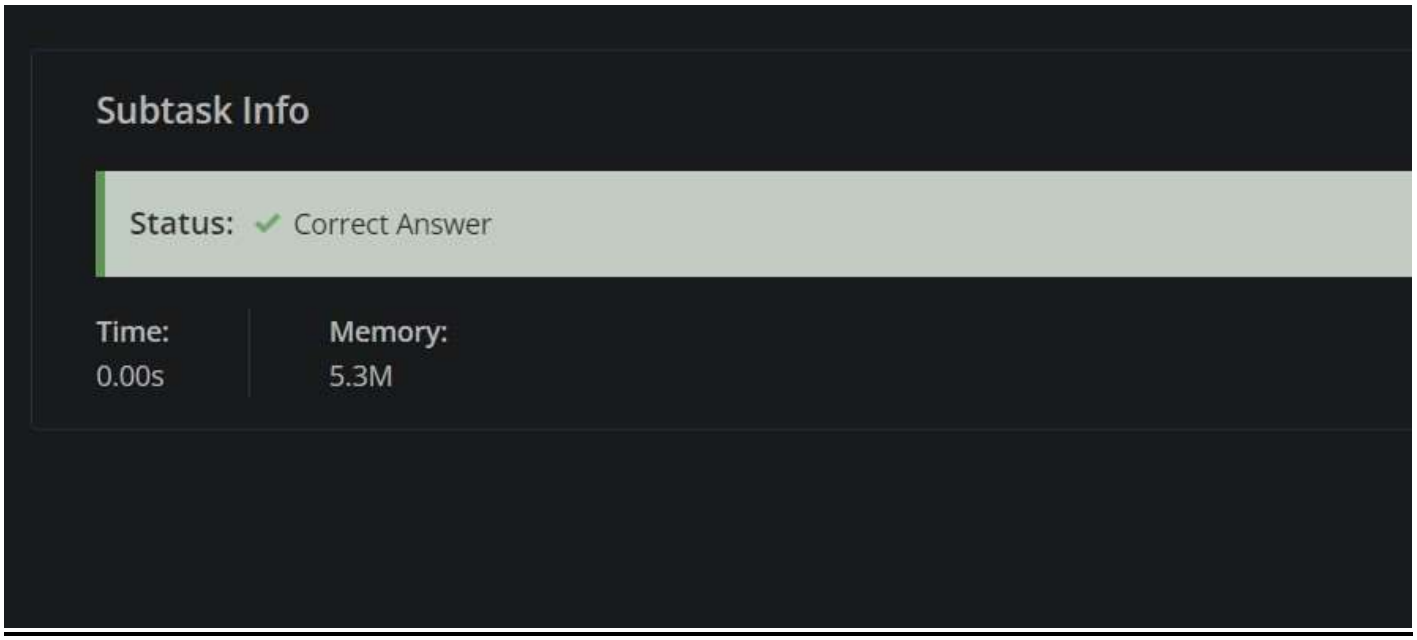
Program Code:

```
#include <bits/stdc++.h>
#include <boost/multiprecision/cpp_int.hpp>
#include <iostream> using namespace
std; using namespace
boost::multiprecision;

int main() {  // your
code goes here
 int t;  cin>>t;
while(t--)
 {
    int n;
```

```
    cin>>n;      cpp_int
fact=1;      for(int
i=n;i>0;i--)
fact=fact*i;
cout<<fact<<endl;
 }
return 0;
}
```

Output



K

```cpp
#include <iostream>
using namespace std;

int main() {
    int n,i;
    int a,b;
    cin>>a>>b;


    if(a==0 and (b==0 or (b==1))){
        cout<<"https://www.codechef.com/practice"<<endl;}
    else if(a==1 and b==0){
        cout<<"https://www.codechef.com/contests"<<endl;}
    else{
        cout<<"https://discuss.codechef.com"<<endl;}

    return 0;
}
```

Test against Custom Input

```
0 1
```

Problem Solver Badge 49 / 50

Solve 1 more problem to get Bronze Badge

Next Problem

Status: ✔ Correct Answer Submission ID: 84131231

Time: