WORKSHEET 1

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DOMAIN CAMP: 16-01-2023 to 28-01-2023
Section/Group: DWWC-77
Subject Name: IT Skills (DSA)

Question 1. FIRE & ICE

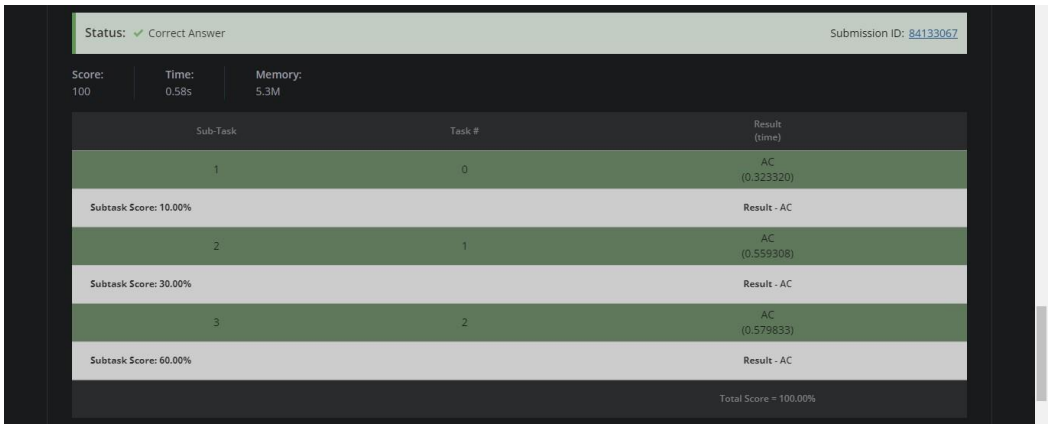
Language: C++14

```
#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];

}


/* Optimized version of power() in method 4 */

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;
}
```

SOLUTION:



Status: ✔ Correct Answer — Submission ID: 84133067

Score: 100 | Time: 0.58s | Memory: 5.3M

Sub-Task	Task #	Result (time)
1	0	AC (0.323320)
Subtask Score: 10.00%		Result - AC
2	1	AC (0.559308)
Subtask Score: 30.00%		Result - AC
3	2	AC (0.579833)
Subtask Score: 60.00%		Result - AC
		Total Score = 100.00%

Question 2. GOLD MINING

Language: C++14

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

int main() {
    // your code goes here
    int t;
    cin>>t;
    while(t--){
        int N,X,Y;
        cin>>N>>X>>Y;
        int max_g = (N+1)*Y;

        if(max_g>=X)
        cout<<"YES"<<" ";
        else
        cout<<"NO"<<" ";
    }
    return 0;
}
```

SOLUTION:

Status: ✔ Correct Answer — Submission ID: 84135059

Score:	Time:	Memory:
100	0.01s	5.3M

Sub-Task	Task #	Result (time)
1	1	AC (0.003820)
1	2	AC (0.005502)
1	3	AC (0.005810)
Subtask Score: 100.00%		Result - AC
		Total Score = 100.00%

Question 3. SMALL FCATORIALS

Language: C++14

```cpp
// We have populated the solutions for the 10 easiest problems for your support.
// Click on the SUBMIT button to make a submission to this problem.

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

cpp_int fact(int n){

if (n<=1){
  return 1;
}
 return n*fact(n-1);
}

int main() {
    // your code goes here
    int t;
    cin>>t;
    while(t--)
    {
        int n;
        cin>>n;
        cout<<fact(n)<<endl;
    }

    return 0;
}
```

SOLUTION:

Status: ✔ Correct Answer — Submission ID: 84132016

Time:	Memory:
0.00s	5.3M

Question 4. SUM OF DIGITS

Language: C++14

```cpp
//  We have populated the solutions for the 10 easiest problems for your support.
// Click on the SUBMIT button to make a submission to this problem.

#include <iostream>
using namespace std;

int main()
{
    int t;
    cin>>t;

    while(t--)
    {
        int n;
        cin>>n;

        int sum=0;

        while(n>0)
        {
            sum+=(n%10);
            n/=10;
        }

        cout<<sum<<"\n";

    }
    return 0;
}
```

0:0

SOLUTION:

Status: ✔ Correct Answer Submission ID: 84132934

Time:	Memory:
0.00s	5.1M

Question 5. THE LEAD GAME

Language: C++14

```
#include <bits/stdc++.h>
using namespace std;

int main() {
    int t;
    cin>>t;
    int max=0,leadp=0,c1=0,c2=0;
    for(int i=0;i<t;i++){
        int x,y;
        cin>>x>>y;
        c1+=x;
        c2+=y;
        if(c1>c2){
            int lead=c1-c2;
            if(lead>max){
            max=lead;
            leadp=1;
            }
        }
        else{
            int lead=c2-c1;
            if(lead>max){
            max=lead;
            leadp=2;
        }
        }
    }cout<<leadp<<" "<<max;
    // your code goes here
    return 0;
}
```

0:0

SOLUTION:

Status: ✔ Correct Answer Submission ID: 84198770

Time:	Memory:
0.01s	5.3M

Question 6. SUMS IN A TRIANGLE

Language: C++14

```cpp
#include <bits/stdc++.h>
using namespace std;

int solve(int i,int j,vector<vector<int>> tri,int n,vector<vector<int>> &dp)
{
    if(i==n-1)
    return tri[i][j];
    if(dp[i][j]!=-1)
    return dp[i][j];
    int below=tri[i][j] + solve(i+1,j,tri,n,dp);
    int diag=tri[i][j] + solve(i+1,j+1,tri,n,dp);
    return dp[i][j]=max(below,diag);
}

int main() {
    // your code goes here
    int t;
    cin>>t;
    while(t--)
    {
        int n;
        cin>>n;
        vector<vector<int>> tri;
        for(int i=1;i<=n;i++)
        {
            vector<int> temp;
            for(int j=1;j<=i;j++)
            {
                int x;
                cin>>x;
                temp.push_back(x);
            }
            tri.push_back(temp);
        }

        vector<vector<int>> dp(n,vector<int>(n,0));

        for(int k=0;k<n;k++)
            dp[n-1][k]=tri[n-1][k];

        for(int i=n-2;i>=0;i--)
        {
            for(int j=i;j>=0;j--)
            {
                int below=tri[i][j]+dp[i+1][j];
                int diag=tri[i][j]+dp[i+1][j+1];
                dp[i][j]=max(below,diag);
            }
        }
        cout<<dp[0][0]<<endl;
    }

    return 0;
}
```

0:0

SOLUTION:

Status: ✔ Correct Answer Submission ID: 84199142

Time: 0.12s Memory: 5.3M

Question 7. CHEF ON VACATION

Language: C++14

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

int main() {
    // your code goes here
    int t;
    cin >> t;

    while(t--){
        long long int x,y,z;
        cin >>x>>y>>z;

        long long int goVacations = x+y;
        if(goVacations <= z){
            cout<<"YES"<<endl;
        }
        else{
            cout<<"NO"<<endl;
        }
    }
    return 0;
}
```

0:0

SOLUTION:

Status: ✔ Correct Answer Submission ID: 84133972

Score: 100 Time: 0.01s Memory: 5.3M

Sub-Task	Task #	Result (time)
1	0	AC (0.004150)
1	1	AC (0.006497)
Subtask Score: 100.00%		Result - AC

Total Score = 100.00%