Hari Krishnan Nair   **20BCS2000**   **MM 903-A**

DDWC 43 (IT Skills)

Worksheet 1

Q1. Fire and Ice Code:

```c
#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);

}
```

```c
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

Sub-Task	Task #	Result (time)
1	0	AC (0.324831)
Subtask Score: 10.00%		Result - AC
2	1	AC (0.561415)
Subtask Score: 30.00%		Result - AC

Q2. Gold Mining

Code:

```cpp
#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;

}
```

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

OUTPUT

Q3 The Lead Game

Code:

```cpp
#include<bits/stdc++.h>
```

```cpp
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:

Problem Solver Badge   **23** / 50

Solve **27** more problems to get Bronze Badge

Next Problem

Status: ✔ Correct Answer   Submission ID: 84167877

Time:
0.01s

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Q4. Sums in a triangle

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];
} }
fo
r(
in
t
```

```cpp
i=
n-
2;
i>
=
0;
i--
){
fo
r(
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

Q5. Small Factorials

```
#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