HW1.1

the output is

Guess the output

25

14/2

7

practice makes perfect

HW1.2

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

int main()
{
   cout << "*\n"<<"**\n"<<"***\n"<<"****\n";



}
```

HW3

```
#include<stream

using namespace STD



cout <<"work smart not hard\n";



int maIN() {



        cout << "Children must be taught how to think, not what to think\n"

        cout << "We worry about what a child will become "tomorrow", yet we forget that he is someone today\n";

        cout << "Children are not things to be molded"<", but are people to be unfolded\n";

        cout << "Each day of our lives we make deposits in the memory banks of our children."<<end;

        cout     << ""It is easier to build strong children than to repair broken men""<<"\n";

        cout >> "Children need models rather than critics\n";


        out<<"Children have never been very good at listening to their elders, but they have never failed to imitate them";


        cout < "Children are our most valuable resource\n";
```

HW4.1

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

int main() {
	int a, b;

	cin >> a >> b;

	cout << a << " + " << b << " = " << a + b << "\n";
	cout << a << " - " << b << " = " << a - b << "\n";
	cout << a << " / " << b << " = " << a / b << "\n";
	cout << a << " * " << b << " = " << a * b << "\n";

	return 0;
 }
```

HW4.2

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

int main() {
	string name1;
	cout<<"What is student 1 name: ";
	cin>>name1;
```

```
// Although looks as integer, no guarantee (make be big or has letters)
string id1;
cout<<"His id: ";
cin>>id1;

// Although looks as integer, but grade could be 30.5
double grade1;
cout<<"His math exam grade: ";
cin>>grade1;

//////////////////////////
string name2;
cout<<"What is student 2 name: ";
cin>>name2;

string id2;
cout<<"His id: ";
cin>>id2;

double grade2;
cout<<"His math exam grade: ";
cin>>grade2;

cout<<"\nStudents grades in math\n";
```

```
	cout<<name1<<" (with id "<<id1<<") got grade: "<<grade1<<"\n";
	cout<<name2<<" (with id "<<id2<<") got grade: "<<grade2<<"\n";
	cout<<"Average grade is "<<(grade1 + grade2) / 2.0<<"\n";

	return 0;
}
```

HW4.3

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

int main() {
int even1, even2, even3, even4;
	int odd1, odd2, odd3, odd4;

	cin>>odd1>>even1;
	cin>>odd2>>even2;
	cin>>odd3>>even3;
	cin>>odd4>>even4;

	int even_sum = even1 + even2 + even3 + even4;
	int odd_sum = odd1 + odd2 + odd3 + odd4;

	cout<<even_sum<<" "<<odd_sum<<"\n";
```

```
        return 0;
}
```

HW4.4

The output is

1

2

3

5

8

13

21

34

55

HW4.5

The output is

12345678

HW4.6

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

int main() {
        int num1, num2, num3;
```

```
    cin>>num1>>num2;

    // Swap operation in 3 steps using num3 as temporary storage
    // 1) put num2 value in num3
    num3 = num2;        // now num3 is 231

    // put num1 in num2
    num2 = num1;                // now num2 is 7

    // get the temp value in num3 in num1
    num1 = num3;

    cout<<num1<<" "<<num2<<endl;        // 231 7

    // if hard? maybe watch https://www.youtube.com/watch?v=A7li4rrkS54


    return 0;
}
```

HW4.7

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

int main() {
```

```
	int num1, num2, num3;

	cin>>num1>>num2;

	// Swap operation in 3 steps using num3 as temporary storage
	// 1) put num2 value in num3
	num3 = num2;		// now num3 is 231

	// put num1 in num2
	num2 = num1;			// now num2 is 7

	// get the temp value in num3 in num1
	num1 = num3;

	cout<<num1<<" "<<num2<<endl;		// 231 7

	// if hard? maybe watch https://www.youtube.com/watch?v=A7li4rrkS54



	return 0;
}
```

HW4.8

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

```
int main() {
	int a, b;

	cin >> a >> b;

	// Let's code the 2 possible results
	int equ_is_1 = a * a;
	int equ_is_neg_1 = 2 * a + 1;

	// The trick: we want to make them in 1 equation
	// Where if input is: only 1 equation is computed and the second is zer0
	// To do so: convert -1 to 0 and 1 to 1
	// With simple math, we can convert [-1 1] to [0 1] range

	// value 1 for (b 1) and value 0 for (b -1)
	int is_1 = (b + 1) / 2;
	// value 1 for (b -1) and value 0 for (b 1)
	int is_neg_1 = 1 - is_1;

	// Either 1*something + 0*something for b = 1
	// Or     0*something + 1*something for b = -1
	cout<<is_1 * equ_is_1 + is_neg_1 * equ_is_neg_1;
```

```
    return 0;
}
```

HW4.9

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

int main() {
    int n;

    cin >> n;

    cout<< n * (n+1) / 2;

    /*
     Why this equation?
     Here is an intuition for N = 8
     1 + 2 + 3 + 4 + 5 + 6 + 7 + 8
     Let's arrange as following
     1 8   2 7   3 6    4 5      [first number and last number]  [2nd number, and 2nd from back] ...
     What is the value of each pair? 9 = n+1
     How many pairs? 4 = n/2

     So n/2 pair, each has value n+1
     So total sum is (n * (n+1))/2
```

```
        Now, this works for even N
        Your turn: why works for odd N

        More readings:
http://mathcentral.uregina.ca/qq/database/qq.02.06/jo1.html
        */

        return 0;
}
```

HW5

THE OUTPUT IS

1

0

1

0

1

1

1

0

1

0

HW5.2

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

int main() {

	int a = 10, b = 20, c = 30, d = 40;

	cout << (a + b == c) << "\n";
	cout << (a + b + c >= 2 * d) << "\n";

	cout << (a > 5 || d < 30) << "\n";
```

```
        cout << (a > 5 && d < 30) << "\n";
        cout << (a <= b && b <= c) << "\n";

        cout << (a > 5 && d < 30 || c - b == 10) << "\n";
        cout << (a <= b && b <= c && c <= d) << "\n";

        cout << (a > 5 && d < 30 || c > d || d % 2 == 0) << "\n";
        cout << (a > 5 && d < 30 || c > d && d % 2 == 0) << "\n";

        cout << ( a == 10 || b != 20  && c != 30 || d != 40) << "\n";
        cout << ((a == 10 || b != 20) && c != 30 || d != 40) << "\n";

        return 0;
}
```

HW6

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

int main() {

        int a = 10, b = 20, c = 30, d = 40;

        cout << (a + b == c) << "\n";
        cout << (a + b + c >= 2 * d) << "\n";
```

```
	cout << (a > 5 || d < 30) << "\n";
	cout << (a > 5 && d < 30) << "\n";
	cout << (a <= b && b <= c) << "\n";

	cout << (a > 5 && d < 30 || c - b == 10) << "\n";
	cout << (a <= b && b <= c && c <= d) << "\n";

	cout << (a > 5 && d < 30 || c > d || d % 2 == 0) << "\n";
	cout << (a > 5 && d < 30 || c > d && d % 2 == 0) << "\n";

	cout << ( a == 10 || b != 20  && c != 30 || d != 40) << "\n";
	cout << ((a == 10 || b != 20) && c != 30 || d != 40) << "\n";

	return 0;
}
```

HW6.2

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

int main() {

	double a1, a2, a3, a4, a5;
	cin >> a1 >> a2 >> a3 >> a4 >> a5;
```

```
	double avg1 = (a1+a2+a3+a4+a5) / 5.0;// A
	double sum1 = (a1+a2+a3) / (a4+a5);		// B
	double first3_avg = (a1+a2+a3) / 3.0;
	double last2_avg = (a4+a5) / 2.0;
	double avg2 = first3_avg / last2_avg;	// C

	cout<<avg1<<"\n";
	cout<<sum1<<"\n";
	cout<<avg2<<"\n";

	cout<<sum1 * 2.0/3.0<<"\n";		// C = 2/3 B

	return 0;
}
```

HW6.3

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

int main() {

	int n;
	cin >> n;
```

```
	int last1 = n % 10;
	n /= 10;

	int last2 = n % 10;
	n /= 10;

	int last3 = n % 10;
	n /= 10;

	cout << last1 + last2 + last3 << "\n";

	return 0;
}
```

HW6.4

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

int main() {

	int n;
	cin >> n;
cout << (n / 1000) % 10 << "\n";

	return 0;
```

HW6.5

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

int main() {

	double a, b;
	cin>>a>>b;

	double result = a/b;

	cout<<result - (int)result;

	return 0;
}
```

HW6.6

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

int main() {

	int n, m;
	cin >>n>>m;
```

```
int result = n - (n / m) * m;

        cout << result << " " << n % m << "\n";

        return 0;
}
```

HW6.7

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

int main() {

        int n, m;
        cin >> n >> m;

        // let's try 13/5
        // 13/5 = 2  [2 complete units, each is 5]
        // 2*5 = 10  [total complete units]
        // Reminder is 13-10 = 3. This number generates the fractional part
        int result = n - (n / m) * m;

        cout << result << " " << n % m << "\n";
```

```
	return 0;
}
```

HW6.8

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

int main() {

	int days;

	cin >> days;

	int years = days / 360;
	days = days % 360; // now we remove # of complete years

	int months = days / 30;
	days = days % 30;

	cout<<years<<" "<<months<<" "<<days<<"\n";


	return 0;
}
```

HW7

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

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

	bool is_a_even = (a % 2 == 0);
	bool is_b_even = (b % 2 == 0);

	if (!is_a_even && !is_b_even)
		cout << a * b << "\n";
	else if (is_a_even && is_b_even)
		cout << a / b << "\n";
	else if (!is_a_even && is_b_even)
		cout << a + b << "\n";
	else
		cout << a - b << "\n";

	return 0;
}
```

HW7.2

```
#include<iostream>
```

```
using namespace std;

int main() {
	int a, b, c, tmp;
	cin >> a >> b >> c;

	if (b < a) { // Swap them

		tmp = a;
		a = b;
		b = tmp;
	}
	// Now a, b are correct

	if (c < b) { // Swap them

		tmp = b;
		b = c;
		c = tmp;

		// Now b, c are correct
		// But a, b may not be again

		if (b < a) {	// Swap them{
```

```
                tmp = a;
                a = b;
                b = tmp;
            }
        }
        cout<<a<<" "<<b<<" "<<c<<"\n";

        return 0;
}
```

Hw7.3

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

int main() {
        int a, b, c, tmp;
        cin >> a >> b >> c;

        if (b < a) { // Swap them

            tmp = a;
            a = b;
            b = tmp;
        }
        // Now a, b are correct
```

```
        if (c < b) { // Swap them

                tmp = b;
                b = c;
                c = tmp;

                // Now b, c are correct
                // But a, b may not be again

                if (b < a) {       // Swap them{
                        tmp = a;
                        a = b;
                        b = tmp;
                }
        }
        cout<<a<<" "<<b<<" "<<c<<"\n";

        return 0;
}
```

Hw7.4

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

```
int main() {
	int x, a1, a2, a3, a4, a5;

	cin >> x >> a1 >> a2 >> a3 >> a4 >> a5;

	int cnt = 0;

	cnt += (a1 <= x);
	cnt += (a2 <= x);
	cnt += (a3 <= x);
	cnt += (a4 <= x);
	cnt += (a5 <= x);

	cout << cnt << " " << 5 - cnt << "\n";

	return 0;
}
```

Hw7.5

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

int main() {
	int result, num;
```

```
	cin>>result;  // First number

	// Read 9 times and maximize
	cin>>num;    if(result < num)      result = num;
	cin>>num;    if(result < num)      result = num;
	cin>>num;    if(result < num)      result = num;
	cin>>num;    if(result < num)      result = num;
	cin>>num;    if(result < num)      result = num;
	cin>>num;    if(result < num)      result = num;
	cin>>num;    if(result < num)      result = num;
	cin>>num;    if(result < num)      result = num;
	cin>>num;    if(result < num)      result = num;

	cout<<result;

	return 0;
}
```

Hw7.6

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

int main() {
	int cnt, result, num;
```

```
cin>>cnt;

cin>>result;  // First number
cnt -= 1;

// Read  times and maximize
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }
if(cnt > 0)        {cnt -=1;        cin>>num;    if(result < num)    result = num;        }

cout<<result;
```

```
	return 0;
}
```

Hw7.7

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

int main() {
	int x, start, end, cnt = 0;

	cin>>x;

	//Read start and end, then see if X is between them or not, 3 times
	cin>>start>>end;
	cnt += (start <= x && x <= end);

	cin>>start>>end;
	cnt += (start <= x && x <= end);

	cin>>start>>end;
	cnt += (start <= x && x <= end);

	cout<<cnt<<"\n";

	return 0;
```

```
}
Hw7.8 (the last )
#include<iostream>
using namespace std;

int main() {
	int s1, e1, s2, e2;

	cin >> s1 >> e1 >> s2 >> e2;

	if(e1 < s2 || e2 < s1)
		cout<<-1<<"\n";
	else
	{

the second)

		if(s1 < s2)	s1 = s2;
if(e1 > e2) e1 = e2;

cout<<s1<<" "<<e1<<"\n";
	}

	return 0;
```

```
}
```