4. Exercises

4.1.Compile and run the following program, what is the result?

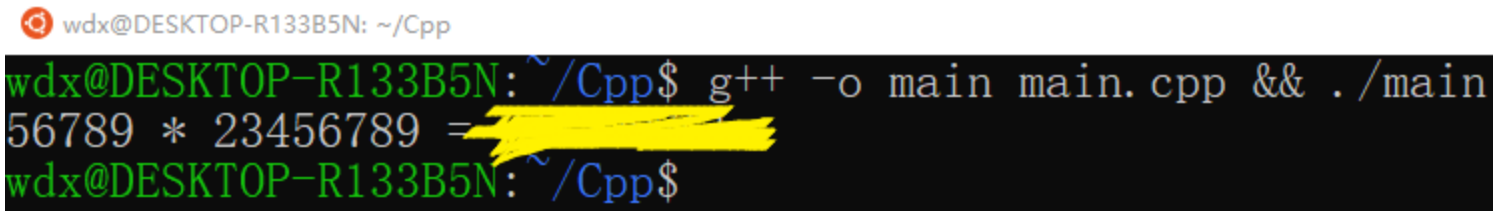
You need to explain the reason to a SA to pass the test.

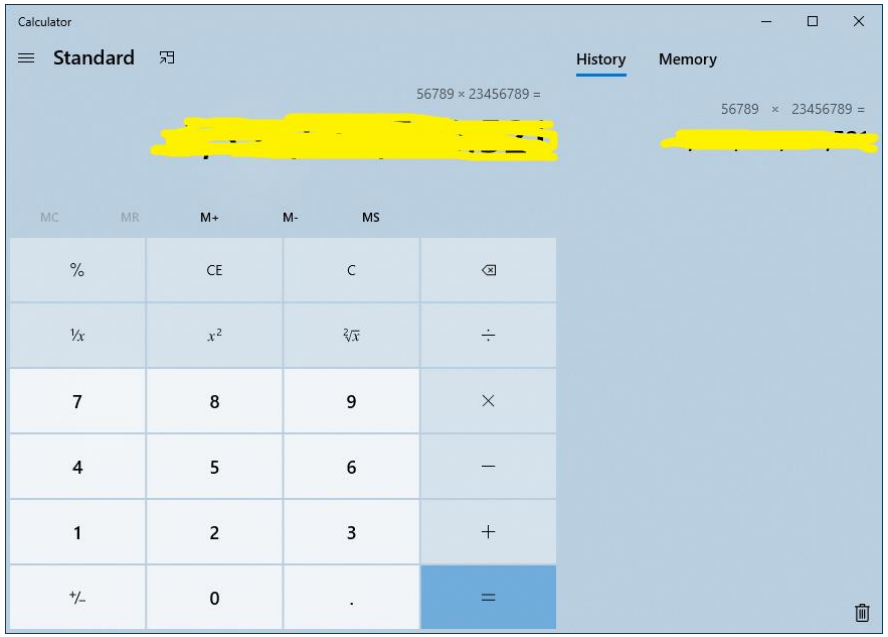
```
#include <stdio.h>
int main()
{
    signed char a = 127;
    unsigned char b = 0x7f;
    char c = 0x7f;

    a=a<<1;
    b=b<<1;
    c=c<<1;
printf("a=%x\nb=%x\nc=%x\n",a,b,c);
    printf("a=%d\nb=%d\nc=%d\n",a,b,c);
    a=a>>1;
    b=b>>1;
    c=c>>1;
printf("a=%x\nb=%x\nc=%x\n",a,b,c);
    printf("a=%d\nb=%d\nc=%d\n",a,b,c);

    return 0;
}
```

4. Exercises

4.2. Write a program to calculate integer multiplication: 56789 * 23456789, and then print the result. Verify the result using a calculator.
If the result is wrong, what could be the reason? How to get the correct result for this exercise?

You need to explain the reason to a SA to pass the test.





4. Exercises

4.3. Run the following source code and explain the result.

```
f1 = 1.000000
f2 = 1.000000
f1 != f2
```

```
#include <iostream>  //file name: lab3_p4_3.cpp
using namespace std;

int main()
{
    cout << fixed;
    float f1 = 1.0f;
    cout<<"f1 = "<<f1<<endl;

    float a = 0.1f;
    float f2 = a+a+a+a+a+a+a+a+a+a;
    cout<<"f2 = "<<f2<<endl;

    if(f1 == f2)  //TIPS: Modify the code here
        cout << "f1 == f2" << endl;
    else
        cout << "f1 != f2" << endl;

    return 0;
}
```

Then using the method learnt in lecture2 to make the output of the code same as following picture .

```
f1 = 1.000000
f2 = 1.000000
f1 == f2
```

NOTE: DO NOT use if (f1=f2) instead of if(f1==f2).

4.Exercises

4.4. Complete the following source code to print the variables as the following picture and explain the result.

Why the value of a and b are not equal? Explain the division operation with different types.

You need to explain the reason to a SA to pass the test.

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

int main()
{
    int a, b;
    double c, d,f,g;
    char h;

    a = 19.99 + 21.99;
    b = (int)19.99 + 21.99;
    c = 23 / 3;
    d = 23 / 3.0;
    f = 23 / 3.0e4;
    g = 23 / 3.0e5;
    h = 'b' - 32;

    //complete code here
    return 0;
}
```

```
B
41
40
7
7.66667
7.66667e-05
0.000766667
```

4.Exercises

4.5. What is the output of the code as follows? What is the meaning of **auto** when defines a variable in C++?

You need to explain the reason to a SA to pass the test.

```
#include <iostream>

int main()
{
    auto a = 10;
    a = 20.5;
    a += 10.5;
    std::cout << a << std::endl;

    auto b=10.0;
    b = 20.5;
    b +=a;
    std::cout << b << std::endl;

    return 0;

}
```