

本頁的範例，尋求不同資料格式的最大值。同法可以求得最小值（結果見最後一頁）

```
#include <iostream>
//#include <stdio.h>
//stdio.h is the header file in the C standard library. It is used for input/output.
//iostream is the input output class in C++ So if you're using C++ just use #include
//<iostream>

//#include <iomanip>

#include <cmath>
//#include <math.h>
//math.h is the deprecated C header. cmath is the C++ header. The difference is that
//cmath puts all the names in the std namespace.

//#include <vector>

int main() {
    int i, ia, ib, ic;
    float a,b,c;
    double aa, bb, cc;
    long double aaa, bbb, ccc;
    FILE * pFile;
    pFile=fopen( "Hsiao.txt", "w");

    a=1;
    for (i=1;i<20000;i++)
    {
        c=a;
        a=a*2;
        if(a/2 > c)
        {
            fprintf(pFile, "Maximum float number < 2* %30.16g (=2^ %d )\n", c, i);
        }
    }
    fprintf(pFile, "%30.16g %d \n", c, i);

    aa=1;
    for (i=1;i<20000;i++)
    {
        cc=aa;
        aa=aa*2;
        if(aa/2 > cc)
        {
            fprintf(pFile, "Maximum double number < 2* %30.16g (=2^ %d )\n", cc, i);
        }
    }
    fprintf(pFile, "%30.16g %d \n", cc, i);

    aaa=1;
    for (i=1;i<20000;i++)
    {
        ccc=aaa;
        aaa=aaa*2;
        if(aaa/2 > ccc)
        {
            fprintf(pFile, "Maximum long double number <2* %35.20Lg (=2^ %d )\n",
ccc, i);
        }
    }
    fprintf(pFile, "%35.20Lg %d \n", ccc, i);
    fprintf(pFile, "-----\n");

    bb=0;
```

```

for (i=1;i<2022;i++)
{
    aa=i;
    bb=bb+log10(aa);
}
fprintf(pFile, "log10( %d ! ) = %35.16g \n", i-1, bb);
fprintf(pFile, "-----\n");
//
ia=INT_MAX;
a=__FLT_MAX__;
aa=__DBL_MAX__;
fprintf(pFile, "Maximum double, float, integer= %35.16g %20.7g %d \n", aa,a,ia);
ia=INT_MIN;
a=__FLT_MIN__;
aa=__DBL_MIN__;
fprintf(pFile, "Minimum double, float, integer= %35.16g %20.7g %d \n", aa,a,ia);
fprintf(pFile, "-----\n");
//
ia=__INT_MAX__;
aa=ia;
// aa=ia;
for (i=0;i<6;i++)
{
    ib=ia+i;
    ic=-i-ia;
    // b=a+i;
    // c=-i-a;
    bb=aa+i;
    cc=-i-aa;
    fprintf(pFile, "i, -Max_Int-i (double, int), -Max_Int+i (double, int), %d,
%20.12g %d %20.12g %d \n", i, cc, ic, bb, ib);
}
//
fprintf(pFile, "-----\n");
ccc=pow(10., 4931);
fprintf(pFile, "pow(10., 4931)=%35.20Lg \n", ccc);
fprintf(pFile, "-----\n");
aaa=10;
fprintf(pFile, "long double aaa = %35.20Lg \n", aaa);
ccc=pow(aaa, 4931);
fprintf(pFile, "pow(aaa, 4931)=%35.20Lg \n", ccc);
// printf("pow(10., 4931)=%35.20Lg \n", ccc);
ccc=pow(aaa, 4932);
fprintf(pFile, "pow(aaa, 4932)=%35.20Lg \n", ccc);
ccc=pow(aaa, 4933);
fprintf(pFile, "pow(aaa, 4933)=%35.20Lg \n", ccc);
ccc=pow(aaa, 4934);
fprintf(pFile, "pow(aaa, 4934)=%35.20Lg \n", ccc);
fclose(pFile);
}

```

## 本頁為以上範例的輸出結果

```
Hsiao.txt
Maximum float number < 2*      1.701411834604692e+38 (=2^ 128 )
Maximum float number <      inf. (=2^ 128 )
Maximum double number < 2* inf. 20000
      8.98846567431158e+307 (=2^ 1024 )
Maximum double number <      inf. (=2^ 1024 )
Maximum long double number <2* inf. 20000
      5.9486574767861588254e+4931 (=2^ 16384 )
Maximum long double number <      inf. (=2^ 16384 )

-----
log10( 2021 ! ) =      5804.892262686465

-----
Maximum double, float, integer=      1.797693134862316e+308      3.402823e+38 2147483647
Minimum double, float, integer=      2.225073858507201e-308      1.175494e-38 -2147483648

-----
i, -Max_Int-i (double, int), -Max_Int+i (double, int), 0,      -2147483647 -2147483647      2147483647 2147483647
i, -Max_Int-i (double, int), -Max_Int+i (double, int), 1,      -2147483648 -2147483648      2147483648 -2147483648
i, -Max_Int-i (double, int), -Max_Int+i (double, int), 2,      -2147483649 2147483647      2147483649 -2147483647
i, -Max_Int-i (double, int), -Max_Int+i (double, int), 3,      -2147483650 2147483646      2147483650 -2147483646
i, -Max_Int-i (double, int), -Max_Int+i (double, int), 4,      -2147483651 2147483645      2147483651 -2147483645
i, -Max_Int-i (double, int), -Max_Int+i (double, int), 5,      -2147483652 2147483644      2147483652 -2147483644

-----
pow(10., 4931)=      inf.

-----
long double aaa =      10
pow(aaa, 4931)=      9.9999999999999971e+4930
pow(aaa, 4932)=      9.9999999999999971e+4931
pow(aaa, 4933)=      inf.
pow(aaa, 4934)=      inf.
```