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Report: hw6\_1

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Class: 乙班

Description:

(float/double) <-> bit pattern

這次作業好多0101…

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Code:

#include <stdio.h>

#include <math.h>

int i;

int main(int argc, char \*argv[])

{

float f;

double d;

unsigned a, y=0x80000000U;

//variables for float <-> binary

unsigned long long b, z=0x8000000000000000ULL;

//variables for double <-> binary

char fl[32], db[64];

//storage for binary

printf("INPUT THE FLOAT NUMBER : ");

scanf("%f", &f);

a=\*(unsigned\*)&f;

while(y!=0)

{

printf("%d", (a&y)!=0U);

y>>=1;

}

a=0;

printf("\nINPUT BINARY NUMBER TO CONVERT FLOAT NUMBER : \n");

scanf("%s", &fl);

for(i=0; i<32; i++)

if(fl[i]-48==1) a+=pow(2,31-i);

printf("%e", \*(float\*)&a);

printf("\n\nINPUT THE DOUBLE NUMBER : ");

scanf("%lf", &d);

b=\*(unsigned long long\*)&d;

while(z!=0)

{

printf("%d", (b&z)!=0ULL);

z>>=1;

}

b=0;

printf("\nINPUT BINARY NUMBER TO CONVERT DOUBLE NUMBER : \n");

scanf("%s", &db);

for(i=0; i<64; i++)

if(db[i]-48==1) b+=pow(2,63-i);

printf("%e\n", \*(double\*)&b);

return 0;

}

Compilation:

gcc –lm –o hw6\_1 hw6\_1.c

Execution:

./hw6\_1

Output:

F74046022@c-2015-2:~/hw6> ./hw6\_1

INPUT THE FLOAT NUMBER : 2.5

01000000001000000000000000000000

INPUT BINARY NUMBER TO CONVERT FLOAT NUMBER :

01000000001000000000000000000000

2.500000e+00

INPUT THE DOUBLE NUMBER : 3.5

0100000000001100000000000000000000000000000000000000000000000000

INPUT BINARY NUMBER TO CONVERT DOUBLE NUMBER :

0100000000001100000000000000000000000000000000000000000000000000

3.500000e+00

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Report: hw6\_2

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Description:

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Code:

#include <stdio.h>

#include <math.h>

union uni{

float f;

double d;

unsigned a;

unsigned long long b;

};

int main(int argc, char \*argv[])

{

union uni u;

int i;

unsigned y=0x80000000U;

unsigned long long z=0x8000000000000000ULL;

char fl[32], db[64];

printf("INPUT THE FLOAT NUMBER : ");

scanf("%f", &u.f);

u.a=\*(unsigned\*)&u.f;

while(y!=0)

{

printf("%d", (u.a&y)!=0U);

y>>=1;

}

u.a=0;

printf("\nINPUT BINARY NUMBER TO CONVERT FLOAT NUMBER : \n");

scanf("%s", &fl);

for(i=0; i<32; i++)

if(fl[i]-48==1) u.a+=pow(2,31-i);

printf("%e", \*(float\*)&u.a);

printf("\n\nINPUT THE DOUBLE NUMBER : ");

scanf("%lf", &u.d);

u.b=\*(unsigned long long\*)&u.d;

while(z!=0)

{

printf("%d", (u.b&z)!=0ULL);

z>>=1;

}

u.b=0;

printf("\nINPUT BINARY NUMBER TO CONVERT DOUBLE NUMBER : \n");

scanf("%s", &db);

for(i=0; i<64; i++)

if(db[i]-48==1) u.b+=pow(2,63-i);

printf("%e\n", \*(double\*)&u.b);

return 0;

}

Compilation:

gcc –lm –o hw6\_2 hw6\_2.c

Execution:

./hw6\_2

Output:

F74046022@c-2015-2:~/hw6> ./hw6\_2

INPUT THE FLOAT NUMBER : -2.5

11000000001000000000000000000000

INPUT BINARY NUMBER TO CONVERT FLOAT NUMBER :

11000000001000000000000000000000

-2.500000e+00

INPUT THE DOUBLE NUMBER : -3.5

1100000000001100000000000000000000000000000000000000000000000000

INPUT BINARY NUMBER TO CONVERT DOUBLE NUMBER :

1100000000001100000000000000000000000000000000000000000000000000

-3.500000e+00

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hw6\_1.c: In function ‘main’:

hw6\_1.c:24:2: error: expected ‘;’ before ‘}’ token

}

^

hw6\_1.c: In function ‘main’:

hw6\_1.c:30:2: error: pointer value used where a floating point value was expected

printf("%e", \*(float)&a);

^

hw6\_1.c:30:15: error: invalid type argument of unary ‘\*’ (have ‘float’)

printf("%e", \*(float)&a);

^

hw6\_2.c: In function ‘main’:

hw6\_2.c:21:5: warning: assignment makes integer from pointer without a cast [enabled by default]

u.a=(unsigned\*)&u.f;

^

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(1)是

(2)00000000000000000000000000000000

(3)由於float有儲存上的誤差，在誤差範圍內的數字都會被省略，造成f1=f2。