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Report: HW7

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Class: 化工 (甲班)

Description:

使用union和struct存取float及double的內容並印出

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

#include<stdio.h>

#include<stdlib.h>

#include<math.h>

union Input{

long long int num;

float num2;

double num3;

};

struct input2 {

long long int \*num;

};

typedef struct input2 Input2;

typedef union Input Input;

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

char mode=atoi(argv[1]);

unsigned long long int i;

Input input;Input2 input2; double num\_lf = 0;

double num=0;double power=0; float num\_f = 0;

switch(mode){

case 1:

input.num2=atof(argv[2]);

for(i=0x80000000;i;i>>=1){

printf("%d",i&input.num?1:0);

if(i==0x80000000)printf(" ");

if(i==0x800000)printf(" ");

}printf("\n");

num\_f = atof(argv[2]); input2.num = (int \*)&num\_f;

for (i = 0x100000000; i >>= 1;) {

printf("%d", i&\*input2.num ? 1 : 0);

if (i == 0x80000000 || i == 0x800000)printf(" ");

}printf("\n"); break;

case 2:input.num3=atof(argv[2]);

for(i=0x8000000000000000;i;i>>=1){

printf("%d",i&input.num?1:0);

if(i==0x8000000000000000)printf(" ");

if(i==(0x10000000000000))printf(" ");

}printf("\n");

num\_lf = atof(argv[2]); input2.num = (int \*)&num\_lf;

for (i = 0x8000000000000000; i; i >>= 1) {

printf("%d", i&\*input2.num ? 1 : 0);

if (i == 0x8000000000000000 || i == 0x10000000000000)printf(" ");

}

printf("\n"); break;

case 3:

for(int i=0;i<8;i++)

power+=((argv[3][i]=='1')?pow(2,7-i):0);

power-=127;

for(int i=0;i<23;i++)

num+=((argv[4][i]=='1')?pow(2,power-1-i):0);

num+=pow(2,power);atoi(argv[2])?num\*=-1:num;

printf("%.3lf",num);printf("\n");num=0.0;power=0.0;

for (i = 0; i < 8; i++)power += argv[3][i] == '1' ? pow(2, 7 - i) : 0; power -= 127;

for (i = 0; i < 23; i++)

num += ((argv[4][i] == '1') ? pow(2, power - 1 - i) : 0);

num += pow(2, power);

atoi(argv[2]) ? num \*= -1 : num;

printf("%.3lf", num); printf("\n"); break;

case 4:

for(int i=0;i<11;i++)

power+=((argv[3][i]=='1')?pow(2,10-i):0);

power-=1023;

for(int i=0;i<52;i++)

num+=((argv[4][i]=='1')?pow(2,power-1-i):0);

num+=pow(2,power);atoi(argv[2])?num\*=-1:num;

printf("%.3lf",num);printf("\n");power=0.0;num=0.0;

for (i = 0; i < 11; i++)power += argv[3][i] == '1' ? pow(2, 10 - i) : 0; power -= 1023;

for (i = 0; i < 52; i++)num += ((argv[4][i] == '1') ? pow(2, power - 1 - i) : 0); num += pow(2, power);

argv[2][0] == '1' ? num \*= -1 : num; printf("%.3lf\n", num); }

return 0;

}Compilation:

gcc -o hw7 hw7.c -lm

Execution:

./hw7 1 85.125

./hw7 2 85.125

./hw7 3 0 10000101 01010100100000000000000

./hw7 4 0 10000000101 0101010010000000000000000000000000000000000000000000

Output:

union 0 10000101 01010100100000000000000

struct 0 10000101 01010100100000000000000

union 0 10000000101 0101010010000000000000000000000000000000000000000000

struct 0 10000000101 0101010010000000000000000000000000000000000000000000

union 85.125

struct 85.125

union 85.125

struct 85.125