

```

#include <stdio.h>
#include <stdlib.h>
#include <math.h>

#define MAX_ANGLE (1 << 10)

int main (int argc, char *argv[])
{
    FILE *fin1, *fin2;
    int i, num;

    double A_real[MAX_ANGLE];
    double A_fixed[MAX_ANGLE];
    double A_freal[MAX_ANGLE];

    fin1 = fopen("angle_real.dat", "r");
    fin2 = fopen("angle_real_out.dat", "r");

    if (fin1 == NULL) {
        perror ("Unable to open file fin1 \n");
        exit( EXIT_FAILURE);
    }

    if (fin2 == NULL) {
        perror ("Unable to open file fin2 \n");
        exit( EXIT_FAILURE);
    }

    i = 0;
    while (fscanf(fin1, "%lf", &A_real[i]) != EOF) {
        fscanf(fin2, "%lf", &A_fixed[i]);
        printf("A_real[%2d]= %20.10e ", i, A_real[i]);
        printf("A_freal[%2d]= %10e ", i, A_freal[i] = A_fixed[i] / (1L<<29));
        printf("\n");
        i++;
    }
    num = i;

    for (i=0; i<num; ++i) {
        printf("%2d ", i);
        printf("cos(%20.10e) = %20.10e ", A_real[i], cos(A_real[i]));
        printf("cos(%20.10e) = %20.10e ", A_freal[i], cos(A_freal[i]));
        printf("\n");
    }

    for (i=0; i<num; ++i) {
        printf("%2d ", i);
        printf("sin(%20.10e) = %20.10e ", A_real[i], sin(A_real[i]));
        printf("sin(%20.10e) = %20.10e ", A_freal[i], sin(A_freal[i]));
        printf("\n");
    }

    fclose(fin1);
    fclose(fin2);

    return 0;
}

```