

```

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

#include "cordic.h"

/*****/

double compute_angle ( int idx, int nIter )

/*****/
/*
  Purpose:

    Angle Array in Binary Tree Representation

  Discussion:

  Licensing:

    This code is distributed under the GNU LGPL license.

  Modified:

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  Author:

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  Parameters:
*/
{
  double angle = 0.0;
  int i, j;
  char s[32];

  for (i=0; i<nIter; i++) {
    j = 1 << i;
    if (idx & (1 << i)) {
      angle += atan( 1. / j );
      s[nIter-i-1] = '1';
    } else {
      angle -= atan( 1. / j );
      s[nIter-i-1] = '0';
    }
    // printf("i=%d j=%d 1/j=%f atan(1/j)=%f \n",
      // i, j, 1./j, atan(1./j)*180/3.1416);
  }
  s[nIter] = '\0';

  // printf("%d %d %s ---> %f \n", nIter, idx, s, angle*180/3.1416);

  return angle;
}

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

  double pi = 3.141592653589793;
  double K = 1.646760258121;
  int nIter = 3;

```

```

int nAngle = 1 << nIter;
int i;
double *A;
double x, y, z;
double delta = 2.*pi / nAngle;
FILE *fp;

if (argc > 1 ) {
    nIter = atoi(argv[1]);
    nAngle = 1 << nIter;
}
printf("nIter = %d \n", nIter);

A = (double *) malloc((1<<20) * sizeof (double));

for (i=0; i<nAngle; ++i) {
    A[i] = compute_angle(i, nIter);
}

fp = fopen("angle.dat", "w");

for (i=0; i<nAngle; i++) {
    fprintf(fp, "0.0 0.0 %f %f %f 0.0 0.0 0.5\n",
            cos(A[i]), sin(A[i]), A[i], A[i]);
}

fclose(fp);

for (i=0; i<nAngle; i++) {
    x = 1 / K;
    y = 0.0;
    z = A[i];

    cordic(&x, &y, &z, nIter+4);

    printf("A[%4d]=%12f z=%12f \n", i, A[i], z);

}

// printf("delta=%f \n", delta);

return 0;
}

```