

```

# 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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  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 () {

  double pi = 3.141592653589793;
  double K = 1.646760258121;
  int nIter = 12;
  int nAngle = 1 << nIter;

```

```

int i;
double A[nAngle];
double x, y, z;
double delta = 2.*pi / nAngle;

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

for (i=0; i<nAngle; i++) {
    printf("A[%d] = %f \n", i, A[i]);
}

for (i=0; i<nAngle; i++) {
    x = 1 / K;
    y = 0.0;
    z = A[i] + delta*2;
    printf("-----\n");
    printf("xi=%f yi=%f zi=%f\n", x, y, z);

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

    printf("xo=%f yo=%f zo=%f\n", x, y, z);
}

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

return 0;
}

```