// Lab 5

// ECE264

// Austin Sypolt

#include <stdio.h> /\* Standard Library of Input and Output \*/

#include <complex.h> /\* Standard Library of Complex Numbers \*/

#include <math.h>

int main()

{

printf("Enter a real number r representing the radius of the circle: ");

int r;

scanf("%d", &r);

printf("Enter a number n for the number of equally spaced points about the circle: ");

int n;

scanf("%d", &n);

int complexArray[n];

double complex z1;

double complex z2;

printf("Real (x) / Imaginary (y) Coordinates of given radius (r) and equally spaced points (n):");

int i;

for (i = 0; i < n; i++){

double theta = (2 \* M\_PI)/n;

double x = r \* cos(theta);

double y = r \* sin(theta);

double complex z = x + y \* I;

complexArray[i] = z;

//printf("%d\n", complexArray[i]);

//printf("%f%+fi\n",creal(z), cimag(z));

//printf("%d\n", complexArrayX[n]);

//printf("%d\n", complexArrayY[n]);

}

for (i=0; i < n; i++){

printf("Complex Value #: %f", i+1);

printf("%f%+fi\n",creal(complexArray[i]), cimag(complexArray[i]));

z1 = complexArray[i];

if ((i+1)!= n){

z2 = complexArray[i+1];

}

else{

z2 = complexArray[i];

}

printf("Two complex points being used: z1 = %.2f + %.2fi\tz2 = %.2f %+.2fi\n", creal(z1), cimag(z1), creal(z2), cimag(z2));

double complex sum = z1 + z2;

printf("Sum of two complex values: z1 + z2 = %.2f %+.2fi\n", creal(sum), cimag(sum));

double complex difference = z1 - z2;

printf("Difference of two complex values: z1 - z2 = %.2f %+.2fi\n", creal(difference), cimag(difference));

double complex product = z1 \* z2;

printf("Product of two complex values: z1 x z2 = %.2f %+.2fi\n", creal(product), cimag(product));

double complex quotient = z1 / z2;

printf("Quotient of two complex values: z1 / z2 = %.2f %+.2fi\n", creal(quotient), cimag(quotient));

double complex conjugate = conj(z1);

printf("The conjugate of z1 = %.2f %+.2fi\n\n", creal(conjugate), cimag(conjugate));

double complex conjugate = conj(z2);

printf("The conjugate of z2 = %.2f %+.2fi\n\n\n", creal(conjugate), cimag(conjugate));

}

}

// Makefile for Lab5

// ECE264

// Austin Sypolt

all: main mainsize complexCalcs

clean:

rm -f main 1 complexCalcs

complexCalcs: complexCalcs.c

cc -o complexCalcs complexCalcs.c -lm

// Need to use lm for sin and cos operations

mainsize: mainsize.c

cc -o mainsize mainsize.c