//

// main.c

// SpherericalExcercises

//

// Created by Randy McMillan on 8/30/13.

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//

// <http://en.wikipedia.org/wiki/Sphere>

#include <stdio.h>

#include <math.h>

#include <string.h>

#define CIRCUMFERENCE\_360 360

double radius;

double circumference;

double R, C, SAS, AC, VS;

void pleaseEnterRadius();

double calculateRadian();

double calculateSAS(double r);

double calculateAC(double r);

double calculateRadius(double r);

double calculateCircumference(double r);

double calculateVolumeSphere(double r);

void calculateCircle();

char yesOrNo;

void welcome()

{

printf("Welcome to Randy McMillan's Ansi C Sphererical Math Excercises!\n\n");

pleaseEnterRadius();

}

void pleaseEnterRadius()

{

printf("Please enter the radius. --> ");

scanf("%lf", &radius);

printf("\n");

// return radius;

}

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

{

calculateCircle();

return 0;

}

void calculateCircle()

{

welcome();

C = CIRCUMFERENCE\_360;

calculateRadian();

circumference = calculateCircumference(radius);

// calculateRadius(circumference);

printf("Circumference of Circle/Sphere = %lf\n\n", circumference);

// printf("Your circle radius = %lf\n\n", calculateRadius(circumference));

AC = calculateAC(radius);

printf("Area of a Circle = %lf\n\n", AC);

SAS = calculateSAS(radius);

printf("Surface Area of Sphere = %lf\n\n", SAS);

VS = calculateVolumeSphere(radius);

printf("Volume of Sphere = %lf\n\n", VS);

char yesOrNo[100];

printf("Would you like to calculate another? y/n ");

scanf("%s", yesOrNo);

if (strncmp(yesOrNo, "y", 2) == 0) {

printf("\n");

calculateCircle();

}

if (strncmp(yesOrNo, "n", 2) == 0) {

printf("Good bye!");

}

}

double calculateRadian()

{

return R = C / (2.0 \* M\_PI);

}

double calculateSAS(double r)

{

return (C \* 4) \* (0.5 \* (r / R));

}

double calculateAC(double r)

{

// printf("Area of cir %lf\n",M\_PI\*pow(r, 2));

return (C \* 4) \* (0.5 \* (r / R)) / 4;

}

double calculateRadius(double c)

{

// printf("%lf\n",c/2.0/M\_PI);

return radius = (c / 360) \* R;

}

double calculateCircumference(double r)

{

// printf("Circumference Circle = %lf\n", 2\*M\_PI\*r);

return (r / R) \* C;

}

double calculateVolumeSphere(double r)

{

// printf("%lf\n",((4.0/3.0) \* M\_PI \* pow(r, 3)));

return calculateSAS(r) / 3;

}

/\*

\*

\* Traditional Formulas

\* r = radius

\* r^2 \* π = Area Circle

\* r^2 \* π \* 4 = Surface Area of a Sphere

\* (4π \* r^3)/3 = Volume of a Sphere

\*

\*/

/\*

\*

\* //Radian Based

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\* R = Radian = 57.25977951

\*

\* SAS = 360 \* 4 \* 1/2R

\* SAS/4 = Area Circle = AC

\* SAS/1/3R = Volume Sphere = VS

\*

\*/