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ESE 124

HW 5

Due: 3/26/14

Design a C program which, when executed, will do the following in the indicated sequence:

1. Ask the user to type on the keyboard a value of the radius of the sphere a.

2. Ask the user to type on the keyboard a value for the runmode operator wihich will determine which computation will be performed. The following values of the runmode operator and the corresponding computations are to be used:

i) runmode 1: compute the volume of the sphere, vsphere = (4πa^3)/3, and output to the console

ii) runmode 2: compute the surface area of the sphere, asphere = 4πa^2, and output to the console

iii) runmode = 3: compute the volume of the cube, vcube = 8a^3, and output to the console

iv) runmode = 4: compute the surface area of the cube, acube = 24a^2, and output to the console

3. Keep running the above sequence until the user inputs a value of 0 for a, after which the whole process is terminated

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#include <stdio.h>

#include <math.h>

double pi = 3.141592653;

double runReturn(int runmode, int a) { /\*Returns the calculation according to runmode\*/

if (runmode > 0 && runmode < 5){ /\*Only runs if the runmode is within the correct range\*/

switch(runmode){

case(1):

printf("The volume of the sphere (vsphere) is: ");

return (pow(a, 3) \* pi) \* (4 / 3);

case(2):

printf("The surface area of the sphere (asphere) is: ");

return (pow(a, 2) \* pi) \* 4;

case(3):

printf("The volume of the cube (vcube) is: ");

return (pow(a, 3) \* 8);

case(4):

printf("The surface area of the cube (acube) is: ");

return (pow(a, 2) \* 24);

default:

printf("Enter in one of the correct runmode choices: ");

return runReturn(runmode, a); //Recursive Solution

} } else {

printf("You have entered an incorrect runmode. Error: ");

return -1;

}

}

int main() {

float a;

int runmode; //declare variables

while (1) {

printf("\nEnter a spherical radius, or \'0\' to exit the program:");

scanf("%f", &a);

if (a == 0)

break;

printf("\nNow enter a runmode(1 for vsphere, 2 for asphere, 3 vcube, 4 acube):");

scanf("%d", &runmode);

if (a != 0) //Only prints out a result if a valid value of a is given.

printf("\n%lf", runReturn(runmode, a));

}

printf("Exiting Program. \n");

getchar();

return 0;

}