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/* Author: Bhishan Poudel
   Question: hw 3.1

develop a program that asks for the user's  height, weight and age (integer).
and then computes clothing sizes according to the formulas:

Hat Size = a weight in pounds divided by height in inches multiplied by 2.9
.....
Jacket Size (chest in size) = height times weight divided by 288 and than adjusted
by adding 1/8 of an inch for each 10 years over age 30.

(Note that adjustment only takes place after a [all 10 years.
So, there is no adjustment for ages 30 through 39,
but 1/8 of an inch is added for age 40)
.....
Waist (in inches) = weight divided by 5.7 and then adjusted by adding 1/10 of an
inch for each 2 years over age 28.

(Note that the adjustment only takes place after a full 2 years.
 So, there is no adjustmentfor age 29. but 1/10 of an inch is addedfor age
30)
.....
Use functions for each calculation. Your program should allow the user to repeat
this calculation as often as the user wishes! That means. functions are invoked within a loop!
.....
*/
//**********************************************first we write include and/or define directives

#include<stdio.h>
#include<math.h>
                        //********************then we write function prototypes

double comp_hatsize(int weight, int height);                                    //fn1
double comp_jacketsize(int age, int height, int weight);            //fn2
double comp_waistsize(int age, int weight);                         //fn3
                        //********************then we define main function: intmain, variables,functions
w/o variable type,return0;

int main()
{
printf("*****************************************************************\n");

        int height, weight, age,n ,i=1;
        double adjust_jacket, adjust_waist;
        double finaljacket;

        printf("How many times you want to repeat this calculation?\t");
        scanf (" %d", &n);
```

```
        for ( i=1; i<=n; i++)                                   // if i=0, n=2 repeats 3 times.
        {
                                                                //eg. h=1,w=1,a=29/40;
hat=2.9;jk=0.003/0.128; wst= .175/.775
        printf("Enter the height in inches (integer)\t");       //eg. h=1,w=288,a=29/40, hat=835.2,
jk=1/1.125, wst=50.526/51.126
        scanf ("%d", &height);
        printf("Enter the weight in pounds (integer)\t");
        scanf ("%d", &weight);
        printf("Enter the age in years (integer)\t");
        scanf ("%d", &age);
        printf("\n");


        comp_hatsize(weight, height);
        comp_jacketsize(age,height, weight);
        comp_waistsize(age,weight);
        }


printf("*****************************************************************\n");
return 0;
}
//*************************************************now we write fn1 (no semicolon) pre:
weight,height post: hatsize.
double comp_hatsize(int weight, int height)
{
        double hatsize;

        hatsize = (weight/height) * 2.9;

        printf("The Hat Size = %.2f inches\n", hatsize);

return (hatsize);
}
//*************************************************now we write fn2 (no semicolon) pre:
age post: adjust_jacket.

double comp_jacketsize(int age, int height, int weight)
{

        double adjust_jacket,jacketsize;

        if (age>=40)
        {
        adjust_jacket = (((floor(age/10)*10) - 30) /80.0);

        printf("adjustment for jackect is = %.3f\n", adjust_jacket);
        }
```

```
	else
	{
	adjust_jacket = 0;
	printf("adjustment for jacket is = %.3f\n", adjust_jacket);
	}

	jacketsize= height*weight/288 + adjust_jacket;

	printf("The jacket size = %.3f\n", jacketsize);
return (jacketsize);
}

//**************************************************now we write fn3 (no semicolon) pre:
age post: adjust_jacket.
double comp_waistsize(int age, int weight)
{
	double adjust_waist, waistsize;

	if (age>=30)
	{

	adjust_waist = (((floor(age/2)*2) - 28) /20.0);


	printf("adjustment for waist is = %.3f\n", adjust_waist);
	}

	else
	{
	adjust_waist = 0;
	printf("adjustment for waist is = %.3f\n", adjust_waist);
	}

	waistsize = weight/5.7 + adjust_waist;
	printf("The waist size = %.3f\n\n", waistsize);

return (waistsize);
}
//**********************************************************the end.

/* Author: Bhishan Poudel
   Question: hw 3.2

Develop a C program that lets the user to choose one geometric object of his or her
choice and then initiates appropriate user interactions, computes and displays the Volume
and Surface Area as the output.

formulas :
```

```
right circular cone, volume v1 = (1.0/3.0)*PI*r*r*h;
right circular cone, area   a1 = PI*r*r + PI*r*s;
slant height              s = sqrt(r*r+h*h);

right circular cylinder
volume v2 = PI*r*r*h;
area   a2 = 2*PI*r*(r+h); */

//********************************************************** first include and define directives.

//**********************************************************first we write include and header
files

#include<stdio.h>
#include<math.h>
#define PI 3.1416

                        //************** then we write function prototypes
void instructions(void);
double comp_volume_cylinder(double radius, double height);
double comp_area_cylinder(double radius, double height);
double comp_volume_cone(double radius, double height);
double comp_area_cone(double radius, double height);

                        // *************then we define main fucntion:
intmain,variables,fucntions,return0;
int main()
{

        double radius, height;
        char   choice;


printf("*************************************************************************\n");
        instructions();

        printf("For cylinder press y, or for cone press n\t");
        scanf (" %c", &choice);

        if (!(choice == 'y' || choice =='Y' || choice == 'n' || choice =='N'))
        {
                printf("Please enter y for cylinder or n for cone\n");
        }
        else
        {
                printf("Enter the radius in cm\t");
                scanf (" %lf", &radius);
                printf("Enter the height in cm\t");
                scanf (" %lf", &height);
```

```
		if(choice == 'y' || choice =='Y')
		{
		comp_volume_cylinder(radius, height);
		comp_area_cylinder(radius, height);
		}
		else if (choice == 'n' || choice =='N')
		{
		comp_volume_cone(radius, height);
		comp_area_cone(radius, height);
		}
	}

printf("*********************************************************************\n");
return 0;
}
//************************************* now we write fn1, instructions has no return value;
void instructions(void)
{
	printf("This program calculates the volume and total surface area of the \n");
	printf("right circular cylinder or cone of your choice.\n");
}
//*************************************now we write fn2: pre: radius,height post: volume
double comp_volume_cylinder(double radius, double height)
{
	double volume_cylinder;

	volume_cylinder = PI *radius* radius* height;

	printf("The volume of the right circular cylinder is =%.2f cm^3\n", volume_cylinder);
 return (volume_cylinder);
}
//*************************************now we write fn3: pre: radius,height post: area
double comp_area_cylinder(double radius, double height)
{
	double area_cylinder;

	area_cylinder = (2*PI*radius*radius) + (2*PI*radius*height);

	printf("The total surface area of the right circular cylinder is =%.2f cm^2\n", area_cylinder);
return (area_cylinder);
}

//*************************************now we write fn4: pre: radius,height post:
cone_volume
double comp_volume_cone(double radius, double height)
{
	double volume_cone;
```

```
	volume_cone =(1.0/3.0) * ( PI *radius* radius* height);

	printf("The volume of the cone is =%.2f cm^3\n", volume_cone);
 return (volume_cone);
}
//****************************************now we write fn5: pre: radius,height post:
area_cone
double comp_area_cone(double radius, double height)
{
	double area_cone;
	double slant_height;

	slant_height = sqrt(radius*radius+height*height);
	area_cone = (PI*radius*radius) + (PI*radius*slant_height);

	printf("The total surface area of the cone is =%.2f cm^2\n", area_cone);
return (area_cone);
}
//****************************************


/* Author: Bhishan Poudel
   Question: hw 3.3
Develop a modular C program that computes and display the area of the sidewalk.
I have a rectangular lawn garden as shown below. This summer I want to have a 3 feet wide gravel
walkway
around the yard to jog with my dogs and cats.
Pompute the area of the walkway i need, around my lawn and garden.
Program should work fro any length or width.
*/

/* inputs: length, width
   output: area of sidewalk
   area = (l+6)*(w+6) - (l*w);

*/
//********************************* first we write include and define functions.

#include<stdio.h>

                                // then we write fucntion prototypes.
void instructions(void);        // fn1
double comp_area( double length, double width);              // fn2, inputs are length and width, output is
area.

                                // then we write main functon: variables,inputs,prototypes and return 0;
int main()
{
```

```
        double length, width;

printf("*********************************************************************************
*\n");
        instructions ();          // inside main fuction we do not write double,int etc for a fucntion

printf("*********************************************************************************
*\n");
        printf("please enter the length of inner garden in feet\t");
        scanf (" %lf", &length);
        printf("please enter the width of inner garden in feet\t");
        scanf (" %lf", &width);


comp_area(length, width);
printf("*********************************************************************************\n")
;
return 0;
}
//*****************************************************************
void instructions(void)          // now we write fn1
{
        printf("This program computes and display the area of the sidewalk around a rectangular
garden.\n");
        printf("The width of the side walk is 3 feet and we can alter length and width of the garden.\n");
                        // for instructins we dont have to write return.

}
//***************************************************************** now we write fn2

double comp_area( double length, double width)
{
        double area;
        area = (length+6)*(width+6) - (length*width);
        printf("The area of the sidewalk is = %.2f sq.feet\n", area);
return (area);
}
//*****************************************************************

 /* Author: Bhishan Poudel
   Question: hw 3.4
You are asked to develop a modular c program to compute the volume
as well as total surface area of a right circular cylinder. */

//*********************************************************first we write include and header
files

#include<stdio.h>
#define PI 3.1416
```

```
                        //************* then we write function prototypes
void instructions(void);
double comp_volume(double radius, double height);
double comp_area(double radius, double height);

                        // ************then we define main fucntion:
intmain,variables,fucntions,return0;
int main()
{

        double radius, height;


printf("*********************************************************************************\n");
        instructions();

        printf("Enter the radius in cm\t");
        scanf (" %lf", &radius);
        printf("Enter the height in cm\t");
        scanf (" %lf", &height);

        comp_volume(radius, height);
        comp_area(radius, height);

printf("*********************************************************************************\n");
return 0;
}
//************************************** now we write fn1, instructions has no return value;
void instructions(void)
{
        printf("This program calculates the volume and total surface area of the \n");
        printf("right circular cylinder.\n");
}
//**************************************now we write fn2: pre: radius,height post: volume
double comp_volume(double radius, double height)
{
        double volume;

        volume = PI *radius* radius* height;

        printf("The volume of the right circular cylinder is =%.2f cm^3\n", volume);
 return (volume);
}
//**************************************now we write fn3: pre: radius,height post: area
double comp_area(double radius, double height)
{
        double area;
```

```
	area = (2*PI*radius*radius) + (2*PI*radius*height);

	printf("The total surface area of the right circular cylinder is =%.2f cm^2\n", area);
return (area);
}
//*****************************************

/* Author: Bhishan Poudel
  Question: hw 3.5
Develop a C program that computes the cost ofa long-distance call.
The cost of the call is determined using the following rate schedule:

a) Any call started between 8:00 am and 6:00 pm, Monday through Friday, is billed at
33 cents per minute.

b) Any call starting before 8:00 am or after 6:00 pm, Monday through Friday, is
charged 21 cents a minute

c) Any call on a Saturday or Sunday, all day, is charged 10 cents a minute
.....
Use day of the call, time of the call and length of the call as input(s) and your program
computes and displays the cost of that call.
*/
//*****************************************************************************
********

#include<stdio.h>

int main()
{
	int length;
	double cost;
	char day,time ;

	printf("If your day of call day is Monday through Friday, press y , otherwise press n\n");
	scanf (" %c", &day);
	printf("If your time of call day is 8 am through 6 pm, press y , otherwise press n\n");
	scanf (" %c", &time);
	printf("Enter the length of the call in minutes \n");
	scanf (" %d", &length);




	if (day == 'y')
	{	if (time == 'y')
		{
			cost = (length * 33)/100.0;		// eg. y,y,2 cost = 2*33=66
			printf("Total due is = $%.2f\n", cost);
```

```
                }
                else
                {       cost = (length * 21)/100.0;             // eg. y,n,2 cost = 2*21=42
                        printf("Total due is = $%.2f\n", cost);
                }

        }
        else
        {       cost = (length * 10)/100.0;                     // eg. n,y,2 or n,n,2 cost = 2*10=20
                printf("Total due is = $%.2f\n", cost);
        }
return 0;
}

/* Author: Bhishan Poudel
  Question: hw 3.6
Write a computer program that computes the duration of a projectile‘s flight
and its height above the ground when it reaches the target.

As part of your solution. write and call a function that displays instructions to the program user.*/
//*************************************************************************************
*****************************************************

#include<stdio.h>
#include<math.h>
#define g 32.17         // acceleration due to gravity

                        // now we define function prototypes i.e., we make function calls
void instructions(void);
double comp_time(double distance, double velocity, double theta);
double comp_height(double velocity, double theta, double time);


//*************************************************************************************
*****************************************************
// now we define main function which includes all variables, all functions, formulas, and return 0; }

int main()
{

        double distance;        // input - distance (\ft) to target
        double velocity;        // input - projectile velocity (ft/sec)
        double theta;           // input - angle (radians) of elevation

        double time;            // output - time (sec) of flight
        double height;                  // output - height at impact

        printf("*************************************************************\n");
        instructions();         // first we call the function1
```

```
                                // then we enter inputs
        printf("*************************************************************\n");
        printf("Enter the value of distance in feet=\t");
        scanf ("%lf", &distance);
        printf("Enter the value of velocity in feet per sec=\t");
        scanf ("%lf", &velocity);
        printf("Enter the value of angle in radian=\t");
        scanf ("%lf", &theta);                          //**********these are inputs in main
function


        time= comp_time(distance, velocity, theta);     //********** this will display time.

        comp_height(velocity,theta,time);

        printf("*************************************************************\n");

return 0;
}
//*****************************************************************************************
*********************************************************
// after main fucntion we write the fucntions

void instructions ()
{

                printf("This program computes the duration of a ");
                printf("projectiles flight \nand its height above the ground ");
                printf("when it reaches the target\n");

}
//*****************************************************************************************
*********************************************************
double comp_time(double distance, double velocity, double theta)
{
        double time;

        time = distance/(velocity*cos(theta));

        printf("The time of flight is %.2fs \n", time);

        return (time);
}
//*************************************************************************
double comp_height(double velocity, double theta, double time)
{

        double height;
```

```
        height = velocity * sin(theta)*time - (g/2.0) *time*time;

        printf("The height of the flight is %.2f m\n", height);

return (height);
}
//*************************************************************************
```