**Source Code**

// Assignment - Week 7 Solution.cpp : Defines the entry point for the console application.

//

#include "stdafx.h"

#include <stdio.h>

#include <stdlib.h>

#include "string.h"

#include "math.h"

void main()

{

//Initialising

float euros;

float cost;

float litres;

float kWhr;

float oilLitres;

float kWhrTotal;

float percentage;

printf("Welcome to the Energy Auditor\n");

printf("------------------------------------\n\n");

printf("Top Down Approach:\n");

printf("------------------------------------\n\n");

// Electricity bill in euros to kWhr equivalent

printf ("Enter average annual electricity bill (euros): ");

scanf("%f", &euros);

cost = euros/0.1524;

printf ("kWhr Equivalent is %.2f\n\n", cost);

// Heating cost in euros to kerosene equivalent in litres

printf("Enter average annual heating cost (euros): ");

scanf("%f", &euros);

litres = euros/0.88;

printf ("Litre Equivalent is %.2f\n\n", litres);

// Kerosene in litres to kWhr equivalent

printf("Enter average annual litres of heating oil (oilLitres): ");

scanf("%f", &oilLitres);

kWhr = oilLitres \* 10.18;

printf ("kWhr Equivalent is %.2f\n\n", kWhr);

// 1 litre of kerosene = 10.18 kWhr – got value from Google search www.graineco.com

// Calculate kWhr total for electricity and heating oil

kWhrTotal = cost + kWhr;

printf ("kWhr total is %.2f\n\n", kWhrTotal);

// Compare with average 23,000kWhr

percentage = ((kWhrTotal/23000)\*100);

printf ("Percentage is %.2f of 23,000\n", percentage);

printf("------------------------------------\n\n\n");

// Bottom Up Approach

printf("Bottom Up Approach:\n");

printf("------------------------------------\n");

// Initialising

int rooms;

float lightWattage;

float lightUsage;

float lightkWhrs;

float sumkWhrs\_lights;

// Calculate light kWhrs

printf("Enter number of rooms: ");

scanf("%d", &rooms);

printf("Enter average wattage of lights (kilowatts): ");

scanf("%f", &lightWattage);

printf("Enter average hours used per day: ");

scanf("%f", &lightUsage);

lightkWhrs = lightWattage\*lightUsage;

sumkWhrs\_lights = ((lightkWhrs\*rooms)\*365.00);

// Calculate tv kWhrs

int tvs;

float tvWattage;

float tvUsage;

float tvkWhrs;

float sumkWhrs\_tv;

printf("Enter number of tvs: ");

scanf("%d", &tvs);

printf("Enter wattage of tv (kilowatts): ");

scanf("%f", &tvWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &tvUsage);

tvkWhrs = tvWattage\*tvUsage;

sumkWhrs\_tv = ((tvkWhrs\*tvs)\*365.00);

// Calculate computer kWhrs

int computers;

float computerWattage;

float computerUsage;

float computerkWhrs;

float sumkWhrs\_computer;

printf("Enter number of computers: ");

scanf("%d", &computers);

printf("Enter wattage of computers (kilowatts): ");

scanf("%f", &computerWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &computerUsage);

computerkWhrs = computerWattage\*computerUsage;

sumkWhrs\_computer = ((computerkWhrs\*computers)\*365.00);

// Calculate shower kWhrs

float showerWattage;

float showerUsage;

float sumkWhrs\_shower;

printf("Enter wattage of shower (kilowatts): ");

scanf("%f", &showerWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &showerUsage);

sumkWhrs\_shower = ((showerWattage\*showerUsage)\*365.00);

// Calculate washing maching kWhrs

float washingMachineWattage;

float washingMachineUsage;

float sumkWhrs\_washingMachine;

printf("Enter wattage of washing machine (kilowatts): ");

scanf("%f", &washingMachineWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &washingMachineUsage);

sumkWhrs\_washingMachine = ((washingMachineWattage\*washingMachineUsage)\*365.00);

// Calculate tumble dryer kWhrs

float tumbleDryerWattage;

float tumbleDryerUsage;

float sumkWhrs\_tumbleDryer;

printf("Enter wattage of tumble dryer (kilowatts): ");

scanf("%f", &tumbleDryerWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &tumbleDryerUsage);

sumkWhrs\_tumbleDryer = ((tumbleDryerWattage\*tumbleDryerUsage)\*365.00);

// Calculate small electric oven kWhrs

float cookerWattage;

float cookerUsage;

float sumkWhrs\_cooker;

printf("Enter wattage of cooker (kilowatts): ");

scanf("%f", &cookerWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &cookerUsage);

sumkWhrs\_cooker = ((cookerWattage\*cookerUsage)\*365.00);

// Calculate kettle kWhrs

float kettleWattage;

float kettleUsage;

float sumkWhrs\_kettle;

printf("Enter wattage of kettle (kilowatts): ");

scanf("%f", &kettleWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &kettleUsage);

sumkWhrs\_kettle = ((kettleWattage\*kettleUsage)\*365.00);

// Calculate small chest freezer kWhrs

float freezerWattage;

float freezerUsage;

float sumkWhrs\_freezer;

printf("Enter wattage of freezer (kilowatts): ");

scanf("%f", &freezerWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &freezerUsage);

sumkWhrs\_freezer = ((freezerWattage\*freezerUsage)\*365.00);

// Calculate fridge freezer kWhrs

float fridgeFreezerWattage;

float fridgeFreezerUsage;

float sumkWhrs\_fridgeFreezer;

printf("Enter wattage of fridge freezer (kilowatts): ");

scanf("%f", &fridgeFreezerWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &fridgeFreezerUsage);

sumkWhrs\_fridgeFreezer = ((fridgeFreezerWattage\*fridgeFreezerUsage)\*365.00);

// Calculate vacuum cleaner kWhrs

float vacuumCleanerWattage;

float vacuumCleanerUsage;

float sumkWhrs\_vacuumCleaner;

printf("Enter wattage of vacuumCleaner (kilowatts): ");

scanf("%f", &vacuumCleanerWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &vacuumCleanerUsage);

sumkWhrs\_vacuumCleaner = ((vacuumCleanerWattage\*vacuumCleanerUsage)\*365.00);

// Calculate microwave kWhrs

float microwaveWattage;

float microwaveUsage;

float sumkWhrs\_microwave;

printf("Enter wattage of microwave (kilowatts): ");

scanf("%f", &microwaveWattage);

printf("Enter average hours of use per day: ");

scanf("%f", &microwaveUsage);

printf("\n");

sumkWhrs\_microwave = ((microwaveWattage\*microwaveUsage)\*365.00);

// Calculate total kWhrs for entire house

float totalkWhrs\_house;

totalkWhrs\_house = sumkWhrs\_shower + sumkWhrs\_washingMachine + sumkWhrs\_tumbleDryer + sumkWhrs\_cooker + sumkWhrs\_kettle +

sumkWhrs\_freezer + sumkWhrs\_fridgeFreezer + sumkWhrs\_vacuumCleaner + sumkWhrs\_microwave + sumkWhrs\_lights +

sumkWhrs\_tv + sumkWhrs\_computer;

printf("Total kWhrs per year is %.2f\n\n", totalkWhrs\_house);

// Calculate percentage of electrical kWhrs accounted for

float percentageAccountedFor;

percentageAccountedFor = ((totalkWhrs\_house/cost)\*100);

printf ("Percentage accounted for is %.2f\n", percentageAccountedFor);

}