#include<iostream>

#include<math.h>

using namespace std;

int main(){

cout<<"CLASS TASK 1."<<endl; //Converting a while loop to a do while loop

int x=1;

do{ //input any integer number from a user, program will continue asking for a number until the number entered is 0 or below 0

cout<<"Enter a Number:\n"<<endl;

cin>>x;

}while(x>0);

cout<<"CLASS TASK 2."<<endl; //Simple calculator using do while loops

double z,y;

char maths,again;

//Input two numbers from the user in order

cout<<"Enter the first and second numbers in order."<<endl;

cin>>z>>y;

do{ //Using A Switch Case, depending on a character entered, various calculations can be performed

cout<<"What calculations would you like to do?\n A=Addition, S=Subtraction, M=Multiplication, D=Division, P=Power, F=Modulus,"<<endl;

cin>> maths;

switch(maths){

case'A':

cout<<z+y<<endl;

break;

case'S':

cout<<z-y<<endl;

break;

case'M':

cout<<z\*y<<endl;

break;

case'D':

cout<<z/y<<endl;

break;

case'P':

cout<<pow(z,y)<<endl;

break;

case'F':

cout<<fmod(z,y)<<endl;

break; }

//using the condition of while, program can be run again depending on input from the user

cout<<"Do you want to do another calculation? (y/n)"<<endl;

cin>>again;

}while (again == 'Y'|| again == 'y');

cout<<"CLASS TASK 3, PART A."<<endl; //Find the sum of all even numbers from 2 to 100 (inclusive)

int even = 0;

int sum;

do{ //utilise two variables, start with a value of 0, add two at each stage, and find the sum of all the numbers

even = even + 2;

sum = sum + even;

}while(even<=98);

cout<<"The Sum of All Even Numbers between 2 to 100 is:"<<sum<<endl;

cout<<"PART B."<<endl; //Find the sum of the squares of all numbers from 1 to 100

int sqr = 1;

int SUM;

do{ //use two variables and utilse the power function

sqr = sqr + 1;

SUM= SUM + pow(sqr,2);

}while(sqr<=99);

cout<<"The Sum of All the squares of 1 to 100 is:"<<SUM<<endl;

cout<<"CLASS TASK 4, PART A."<<endl; //print each power value of 2, starting from 2^0 to 2^20

int two;

int SQ= -1;

do{ //use two variables, state one value as -1, so that 2^0 (by adding 1 to the initial value) can be achieved

SQ = SQ + 1;

two = pow(2.00,SQ);

cout<<"2 to the power of "<<SQ<<" = "<<two<<endl; //output each result as an individual statement

}while(SQ<=19);

cout<<"PART B."<<endl; //Find the sum of all numbers from a to b (a and b being input by the user

int a,b,SuM; //Input two values from the user in order

cout<<"Please enter the limits a to b:"<<endl;

cin>>a>>b;

int c =(a-1); //declare a third variable as a-1, so that the starting value of the sequence is a

do{

c = c + 1;

if (a % 2 != 0){ SuM = SuM + c;} //set the condition if the number divided by zero does not have 0 as the remainder, it is added to the sequence

} while (c <= b - 1);

cout<<"The Sum of all numbers in the limit chosen is:"<<SuM<<endl;

return 0;

}