#include <iostream>

using namespace std;

#define cube(n)(n\*n\*n) //macro cube function

int fib(int n) //fibonacci series function

{

if( n==1 || n == 0)

{

return n;

}

else

{

return fib(n-1) + fib(n-2);

}

} //end of fibonacci series called function

double power(int b,int exp) //power function

{

if(exp==0)

return 1;

else if (exp==1)

return b;

else

return b\*power(b,exp-1);

} //end of power function

int digit(int n,int k) //k.th value function

{

if(k==0)return n%10;

else if(k==1)return n/10%10;

else if(k==2)return n/100%10;

else if(k==3)return n/1000%10;

else if(k==4)return n/10000%10;

else if(k==5)return n/100000%10;

else if(k==6)return n/1000000%10;

else if(k==7)return n/10000000%10;

else if(k==8)return n/100000000%10;

else if(k==9)return n/1000000000%10;

} //end of kth value function

int f(int a,int b) // f(x,y) function

{

return cube(a)+cube(b)-3\*a\*b;

}

int main() //mian function

{

char choice,resp;

cout<<"\t\tSELECT YOUR CHOICE"<<endl;

cout<<"\tType (A) for fibonacci series program"<<endl;

cout<<"\tType (B) for power program"<<endl;

cout<<"\tType (C) for Kth digit program"<<endl;

cout<<"\tType (D) for program to calculate F(x,y)= x3+y3-3\*x\*y"<<endl;

cout<<"Type your Choice here : ";

cin>>choice;

switch (choice)

{

case 'a': //CASE :1 fibonacci series program

case 'A':

int n;

cout<<"Enter the number of fibonacci terms : ";

cin>>n;

for(int i=0; i<=n; i++)

{

cout << fib(i) << endl;

}

break;

case 'B': //CASE :2 power program

case 'b':

int base,exponent;

cout<<"Enter Base integer :";

cin>>base;

cout<<"Enter exponent integer : ";

cin>>exponent;

cout<<base<<"^"<<exponent<<"="<<power(base,exponent)<<endl;

break;

case'c': //CASE :3 kth digit program

case'C':

int num,kth;

cout<<"Enter a number : ";

cin>>num;

cout<<"Enter call digit to return desire value: ";

cin>>kth;

if(num<=999999999 && kth<=9)

cout<<"K'th Digit = "<<digit(num,kth)<<endl;

else

cout<<"Enter number Ranging 0-999999 or enter Valid call digit "<<endl;

break; //end of kth digit program

case'd': //CASE :4 f(x,y)= x3+y3-3\*x\*y program

case'D':

int x,y;

cout<<"The value of X = ";

cin>>x;

cout<<"The value of Y = ";

cin>>y;

cout<<"F(x,y) =x3+y3-3\*x\*y\n\t="<<f(x,y)<<endl;

break;

default:

cout<<"\tInvalid Choice"<<endl;

}

cout<<"Do you want to run the program AGAIN...y|n... ";;

cin>>resp;

if(resp=='y')

{

main();

}

else

{

}

system("pause");

return 0;

}