// file: mult\_recursive1.cpp

// test a recursive function

//

// (1) multiplication of two natural numbers m and n, m , both less than 10

//

// m \* n = m if n = 1

// = m + (n - 1) \* m

//

#include <iostream>

#include <stdlib.h>

int const M\_MAX = 1000;

int const N\_MAX =1000;

int mult\_rec ( int, int);

int mult\_iter (int , int );

using namespace std;

int main (){

cout << "Enter two natural numbers m and n both less than\n "

<< M\_MAX << " and " << N\_MAX << ":\n";

int n;

int m;

cin >> m >> n;

//

if (m <= 0 || n <= 0)

{

cout << "ERROR, end of program, numbers should be greater than 0 \n";

system ("PAUSE");

return 0;

}else

if (m > M\_MAX || n > N\_MAX)

{

cout << "ERROR, end of program, numbers should be smaller than " << "M\_MAX = " << M\_MAX << " and N\_MAX = " << N\_MAX << " \n";

system ("PAUSE");

return 0;

} else

cout << "Result 1, simple multiplication: m \* n is " << m\*n << endl;

cout << "Result 2, recursive multiplication, see (1), is " << mult\_rec(m, n) << endl;

cout << "Result 3, iterative multiplication, is " << mult\_iter(m, n) << endl;

system ("PAUSE");

return 0;

}

int mult\_rec (int k, int j){

if (j == 1)

return k;

else

return (k + mult\_rec (k, j-1));

}

int mult\_iter (int k, int j) {

int prod = 0;

for ( int x = 1; x <= j; x++)

{

prod = prod + k;

}

return prod;

}

/\*

Enter two natural numbers m and n both less than

1000 and 1000:

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Result 1, simple multiplication: m \* n is 7600

Result 2, recursive multiplication, see (1), is 7600

Result 3, iterative multiplication, is 7600

Press any key to continue . . .

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