**MARKS AWARDED: 98**

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\* CS1010 AY2011/2 Semester 2 Lab2 Ex1

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\* collatz.c

\* This program reads a natural number and computes the number

\* of iterations required to turn the input number into 1 by

\* following the Collatz sequence: half it if the number is even,

\* or triple it and add 1 if the number is odd.

\*

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\* B02

\*/

#include <stdio.h>

int count\_iterations (int);

int main(void)

{

int num\_iteration, natural\_number;

printf("Enter a natural number: ");

scanf("%d", &natural\_number);

num\_iteration=count\_iterations(natural\_number);

printf("Number of iterations = %d\n",num\_iteration);

return 0;

}

// Count the number of loops it takes to reach 1

int count\_iterations (int N)

{

int iteration=0;

while(N>1)

{

if (N%2==0) // If N is even, divide by 2

N/=2;

else

N=3\*N+1; // If N is odd, triple it plus 1

iteration++; // Number of loop plus 1

}

return iteration;

}