Computer Programming I — Midterm Exam **#**1

1. Write a recursive function maxCycleLength and cycleLength to complete the C++ program in Student ID-mid1-1.cpp which solves UVa 100 - The 3*n* + 1 problem. (20%)

2. Write functions less, decrement, subtraAssign, multiAssign, multiplication and division to complete the C++ program in Student ID-mid1-2.cpp which solves UVa 10083 - Division. (80%)

if( dividend == 0 )

quotient = 0

remainder = 0

return

remainder = dividend

if( dividend < divisor )

quotient = 0

return

n = dividendSize - divisorSize

buffer = divisor shift left by n positions

quotientSize = n

if( dividend >= buffer )

quotientSize++

quotient = 0

a = divisor[ divisorSize - 1 ]

j = dividendSize - 1;

for( i = dividendSize - divisorSize; i >= 0; i--, j-- )

b = 10 \* remainder[ j + 1 ] + remainder[ j ]

if( a <= b )

quotient[ i ] = b / a

buffer = divisor \* quotient[ i ] \* 10i

while( remainder < buffer )

quotient[ i ]--

buffer = divisor \* quotient[ i ] \* 10i

remainder -= buffer

Grading rule

Accepted:

10% maxCycleLength

10% cycleLength

10% less

10% decrement

10% subtraAssign

10% multiAssign

10% multiplication

30% division

Not Accepted:

9% maxCycleLength

9% cycleLength

9% less

9% decrement

9% subtraAssign

9% multiAssign

9% multiplication

27% division