Comp 333 Homework #1

Due Date on Canvas: Sept 8 at 5 pm

**General directions for submitting work.**  *Copy your solutions into a single Word document called homework1.docx. This document should include your source code and test cases for Problems 1 and 2. Label test cases. Put your name, course, homework # and due date at the top of the first page of your homework1.docx file. All source code files must include as a comment your name, course and homework#.* ***Upload to Canvas a single file called homework1.docx.***

1. Rewrite the following Fortran 77 program as a Java program. Put your solution in a file called Euclid.java. Do not use goto in your Java code. Replace the Fortran goto with a Java while loop. Use Java if – else statements where appropriate. Read in NA and NB. Create the NGCD function using the algorithm from the Fortran code.

**Testcase A :** NA = 252 NB = 156 **Testcase B:** NA = 2379 NB = 1408

Example can be found at <https://en.wikibooks.org/wiki/Fortran/Fortran_examples>

Look up on the internet Fortran statements that are not clear to you. Note that the statement NGCD = IA is the way Fortran returns a value to the calling function.

*\* euclid.f (FORTRAN 77)*

*\* Find greatest common divisor using the Euclidean algorithm*

**PROGRAM** EUCLID

**PRINT** \*, 'A?'

**READ** \*, NA

**IF** (NA.LE.0) **THEN**

**PRINT** \*, 'A must be a positive integer.'

**STOP**

**END IF**

**PRINT** \*, 'B?'

**READ** \*, NB

**IF** (NB.LE.0) **THEN**

**PRINT** \*, 'B must be a positive integer.'

**STOP**

**END IF**

**PRINT** \*, 'The GCD of', NA, ' and', NB, ' is', NGCD(NA, NB), '.'

**STOP**

**END**

**FUNCTION** NGCD(NA, NB)

IA = NA

IB = NB

1 **IF** (IB.NE.0) **THEN**

ITEMP = IA

IA = IB

IB = MOD(ITEMP, IB)

**GOTO** 1

**END IF**

NGCD = IA

**RETURN**

**END**

1. Rewrite the following Pascal program as a Java program. Put your program in a file called PascalEx.java. Read in listlen and the values for intlist. Try to keep your Java program as close to the Pascal program as possible. Include as comment at the bottom of the program, an explanation for all the places in the program where you could not translate directly from Pascal to Java and describe what you did instead.

Compile and run your Java program with each of the following test cases:

**Testcase C:** listlen = 10. The input values for the array intlist are 3,6,5,4,8,2,1,3,2, 9

**Testcase D:** listlen = 100. The input values for the array intlist are 1,2,3,…,100

**program** pascalEx( input,output) ;

**type** intlisttype = **array** [ 1..99] **of** integer;

**var**

intlist: intlisttype;

listlen, k, sum, result : integer;

average: real;

**begin**

result := 0;

sum := 0;

readln( listlen);

**if** ( listlen > 0) **and** ( listlen < 100) **then**

**begin**

**for** k:= 1 **to** listlen **do**

**begin**

readln( intlist[k]);

sum := sum + intlist[k]

**end;**

average := sum /listlen;

**for** k := 1 **to** listlen **do**

**if** ( intlist[k] > average) **then**

result := result + 1;

{Print result}

writeln(‘The number of values > average is ‘, result)

**end**

**else**

writeln(‘Error – input list length is not legal’)

**end.**