**Name:**

**Grade: /75**

**COSC 1435.001**

**Lab 3 Part 1**

Please use this document to submit your answers (Save As). Make sure you write your name in the designated space in this document.

1. Trace through each pseudocode segment with user inputs as shown in tables. As you trace, record the values of each variable and any output provided. Each time you trace, use the numbers under the ‘Input’ column. Clearly identify the purpose of this algorithm in the space provided. The first line has been done for you as an example.
   1. **Tracing [8 points]**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| a | b | c | **Output** | **Input** |
|  |  |  | **Input 2 numbers** | **2 -1** |
| 2 | -1 | 2 |  |  |
| -1 | 2 | 2 | -1 |  |
| 0 | 2 | 2 | 0 |  |
| 1 | 2 | 2 | 1 |  |
| 2 | 2 | 2 | 2 |  |
| 3 | 2 | 2 |  |  |
|  |  |  |  |  |

Print “Input 2 numbers: ”

Get a and b

If (b < a)

c🡨 a

a🡨 b

b🡨 c

End if

While (a <= b)

Print a

a🡨a + 1

End while

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| a | b | c | **Output** | **Input** |
|  |  |  | **Input 2 numbers** | **3 6** |
| 3 | 6 |  | 3 |  |
| 4 | 6 |  | 4 |  |
| 5 | 6 |  | 5 |  |
| 6 | 6 |  | 6 |  |
| 7 |  |  |  |  |
|  |  |  |  |  |

**What is the purpose of the above algorithm? [5 points]**

**To understand how if statements, and while loops work, and to be able to trace them. As well as learning how to follow the algorithims and directions like a computer would.**

* 1. **Tracing [8 points]**

|  |  |  |  |
| --- | --- | --- | --- |
| a | b | **Output** | **Input** |
|  |  | Enter a value: | **4** |
| 4 | 0 | Enter a value : | **0** |
| 0 | 1 | Enter a value: | **-6** |
| -6 | 1 | Enter a value: | **0** |
| 0 | 2 | Enter a value: | **-1** |
| -1 | 2 | Result is 2 |  |

Print “Enter a value:”

Get *a*

b🡨 0

While (*a* ≠ -1)

If (*a* = 0)

*b*🡨 (*b* + 1)

End if

Print the message “Enter a value:”

Get *a*

End while

|  |  |  |  |
| --- | --- | --- | --- |
| a | b | **Output** | **Input** |
|  |  | Enter a value: | **7** |
| 7 | 0 | Enter a value: | **-2** |
| -2 | 0 | Enter a value: | **-1** |
| -1 | 0 | Result is 0 |  |
|  |  |  |  |
|  |  |  |  |

Print “Result is: “, *b*

**What is the purpose of the above algorithm? [5 points]**

**To understand how if statements, and while loops work, and to be able to trace them.**

**As well as learning how to follow the algorithims and directions like a computer would.**

1. What sequence of numbers would be printed if the following procedure is executed with the value of N being 0? [5 points]

procedure fun(N)

while (N < 4)

printN

N ←N + 2

printN

End while

Answer: 0,2,2,4,4,6

1. Write pseudocode of an algorithm that performs multiplication of two numbers entered by the user using addition (for example, 2\*3 = 2+2+2, 4\*2 = 4 + 4). (15 points)

Print “ Enter a Number “

Get X

Print “Enter Another Number “

Get Y

1. Identify a flaw in the following loop. [5 points]

X ← 3

while (X ≠ 8)

(X ←X + 2)

end while

answer: because of line 3, X will never equal 8, so the loop will continue forever.

1. The following pseudocode was designed to compute the largest integer whose square is no greater than N. (If N is 5, then the procedure should print the value 2.) Find and correct the logic error. [6 points]

proceduresquareRoot (N)

X ← 0

while (X2≤ N)

X ← X + 1

end while

Print X

Answer: N has no value, Because of line 3, X will never be greater than N so it continues an infinate loop.

1. Write an algorithm in pseudocode that can be used by the grader of this course to calculate the total score of assignments based on the late policy described in this course syllabus. [10 points]
2. Write an algorithm in pseudocode for the procedure: Input a number X and assign -1, 0, or 1 to another variable Y, depending on whether the entered number is negative, zero or positive, respectively. [8 points]

Print “Enter a Number”

Get X

If (X = 0)

Print “0”

If (X < 0)

Print “-1”

If (X > 0)

Print “1”

end