Lab 01 CSC 120

1. (+10 ) Problem #1 in the Chapter review problems

***Answer b is provided Answer a and c***

|  |  |  |
| --- | --- | --- |
| ***Upper*** | ***Lower*** | ***Output*** |
| ***1*** | ***0*** | ***0*** |
| ***0*** | ***1*** | ***0*** |

|  |  |  |
| --- | --- | --- |
| ***Upper*** | ***Lower*** | ***Output*** |
| ***1*** | ***0*** | ***0*** |
| ***0*** | ***1*** | ***1*** |

c

|  |  |  |
| --- | --- | --- |
| ***Upper*** | ***Lower*** | ***Output*** |
| ***1*** | ***0*** | ***0*** |
| ***0*** | ***1*** | ***1*** |

1. (+5 ) Problem #2 in the Chapter review problems Your answer should be OR or AND or XOR etc. gate(s) Answer b is provided

a. The first part would be NOT gate and second would be OR gate

b. The entire circuit is equivalent to an Exclusive OR (XOR) gate.

1. (+5) Problem #7 in the Chapter review problems

***Answer a, b, c e are provided Only answer d***

* 1. 1100 1101
  2. 0110 0111
  3. 1001 1010
  4. 1111 1111
  5. 0001 0000

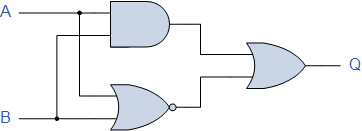
1. (+5) Given the answers for Problem #9 in the Chapter review problems :
2. A0A
3. C7B
4. 0BE

Express the following bit pattern in hexadecimal notation

1010 1011 1100

ANS: ABC

1. (+5) Determine the output Q in terms of the inputs A and B by filling in the table below



|  |  |  |
| --- | --- | --- |
| A | B | Q |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

1. (+5) Determine the outputQ, in terms of the inputs A B, by filling in the table below (the Q column should only consist of a 1 or 0 See Figure 1.2 in text

|  |
| --- |
| Logic Diagram |

|  |  |  |
| --- | --- | --- |
| A | B | Q |
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 1 |

1. (+5) The output of a logic gate is ‘1’ when all its input is at 0 as shown below

INPUT OUTPUT

A B C

0 0 1

0 1 0

1 0 0

1 1 0

The gate is either:

(a) NAND or an XOR gate (b) NOR or an XNOR gate

(c) an OR or an XNOR gate (d) an AND or XOR gate

ANS:\_\_\_\_\_**B**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. (+5) In the lesson folder, the item titled Boolean Algebra: logic gates please fill in the values in the table duplicated here:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | B | C == NAND (not AND) Output | D == XOR  Output | Q == X NOR Output |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 |
| 1 | 0 | 1 | 1 | 0 |
| 1 | 1 | 0 | 0 | 0 |

1. (+5 ) Problem #30 in the Chapter review problems

*Answer a b c and e are provided*

***NOTE: if the most significant digit is 1 the number is negative***

1. 15
2. -12
3. 12
4. -15
5. -10
6. (+5 ) Problem #31 in the Chapter review problems

*Answer a b d e are provided Only answer c*

* 1. 0001101
  2. 1110011
  3. 1000010
  4. 0000000
  5. 0010000

1. (+5) What is the result of the following addition problem (using two’s complement notation)? *Highlight your answer*

00001111 This is a positive integer

+ 10101010 Negative integer

A. 01100101 B. 10111001

C. 01010101 D. 10110101

1. (+5) What is the result of the following subtraction problem (using two’s complement notation)?

00001111 positive integer

- 10101010 negative integer

A. 01100101 B. 10111001

C. 01010101 D. 10110101

1. (+10) in the document ***“Converting decimal fractions to binary.doc*** available in this lesson, 1/10 (==.1) is converted to an infinite repeating binary fraction. Using the strategy available in the document convert 3/10 to an infinite repeating binary fraction **Underline the pattern**

ANS: .01**0011**00110011….

1. (+15) Based on the video and the URL in the lesson item titled “Decimal to IEEE 754 Floating Point Representation” 265.3 is converted to 754 floating point (in the video) and the decimal 4.6 is converted to floating point representation (in the URL), What is the IEEE 754 floating point representation of the decimal (32 bits needed )

125.7

ANS: \_1011111.101100110…\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. (+15) Based on the video and the URL in the lesson item titled “Decimal to IEEE 754 Floating Point Representation” 265.3 is converted to 754 floating point (in the video) and the decimal 4.6 is converted to floating point representation (in the URL), What is the IEEE 754 floating point representation of the decimal (32 bits needed )

45.875

ANS: \_\_\_\_\_**101101.1110**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(+15) Write a Python program that will prompt the user for three integers and **display**

* 1. the integers,
  2. their sum,
  3. their product,
  4. maximum using the max function
  5. minimum using the min function
  6. average of the three integers NOTE: use you answer from 2 (sum) do NOT add the numbers again
  7. the sum raised to the power of the minimum integer (use operator \*\*)
  8. the sum divided by the minim integer from 5 above (use operator / )
  9. The sum divided by the maximum integer from 4 above (**use operator //** ) NOTE: // may be referred to as integer division in the literature
  10. Average of the largest and smallest integers
  11. Display the integers in sorted order (use your max, min and sum variables from above ) do NOT use the sort() function. The middle number = sum – (max + min)
  12. your name
  13. your major
  14. Reason you are taking CSC 120
  15. What are your plans 5 years from now

***Assume the user does not use decimals and the integers are NOT zero***

***Use the template provided Template01.py (See the source code tab in BlackBoard )***

**Contents of Template01.py**

*# input statements*

*A = 2*

*B = 3*

*C = -2*x = int(input(**" Please enter integer ..."**))  
y = int(input(**" Please enter another integer ..."**))  
z = int(input(**" Please enter the third integer ..."**))  
  
**print**(**"the numbers entered are "**, x,**" and"**, y, **" and "**, z)  
s = x + y + z  
m = max(x,y,z) *# MAX function similar function for min*p = x\*y\*z  
**print**(**"values are SUM = "**, s, **" product = "**, p, **" maximum = "**, m)  
*# this is a comment  
#the following if...else structure is used to illustrate the syntax  
# note the3 indentation*

*# the code below is to illustrate a if….else*

*for illustration only and not needed for the lab* ***Please comment out*****if** (x > 0) :  
 x = A\*x  
 x = B\*x  
**else**:  
 y = C\*y  
 y = A\*y  
  
**print**(**"NEW value of x = "**, x, **" and "**, **" y "**, y)

**NOTE:** Please name this file yourlastNameLab01.py. As an example if your last name was Euclid then you should submit EuclidLab01.py

# Arithmetic Operators in python

Operators Description Example Calculation Output

= assignment            x = 10

==        equality          x == y Is x equal to y

-x         negation        x = -10    y = -x          y == 10

x + y      addition        10 + 11                   21

x - y      subtraction     10 - 11                   - 1

x \* y      multiplication 10 \* 11                   110

x / y      division       25 / 10                   2.5

x // y     division(int) 25 // 10                   2

                           25// 10.0                  2.0

x % y      modulus        25 % 10                   5 (remainder)

                           25 % 7                     4 (remainder)

X \*\* y     exponentiation 10 \*\* 2                    100 (== 102     )