**Task No. 1:** Complete the table by solving the bitwise instruction of all Logical gates. Add the code and output of the logical gates to show solution of MASK BITS given in the table.

**Solution:**

|  |  |  |
| --- | --- | --- |
| **Logic** | **Mask Bits** | |
|  | **0** | **1** |
| **AND** | 0 | 63 |
| **OR** | 63 | -1 |
| **NOT** | -64 | -64 |
| **XOR** | 63 | -64 |
| **XNOR** | -64 | 63 |
| **NOR** | -64 | 0 |
| **NAND** | -1 | -64 |

**AND WITH MASK 1**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

li $t1,0xffffffff

li $v0,4

la $a0,num1

syscall

li $v0,5

syscall

move $t0,$v0

li $v0,4

****la $a0,result

syscall

and $t2,$t0,$t1

li $v0,1

move $a0,$t2

syscall

li $v0,10

syscall

**Output**

**Graphical user interface, application

Description automatically generated**

**AND WITH MASK 0**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

#li $t1,0xffffffff

**A picture containing graphical user interface

Description automatically generated**li $t1,0x000000000

li $v0,4

la $a0,num1

syscall

li $v0,5

Table

Description automatically generatedsyscall

move $t0,$v0

li $v0,4

la $a0,result

syscall

and $t2,$t0,$t1

li $v0,1

move $a0,$t2

syscall

li $v0,10

syscall

**Output**

**OR WITH MASK 1**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

li $t1,0xffffffff

li $v0,4

la $a0,num1

syscall

li $v0,5

syscall

move $t0,$v0

li $v0,4

la $a0,result

syscall

or $t2,$t0,$t1

li $v0,1

move $a0,$t2

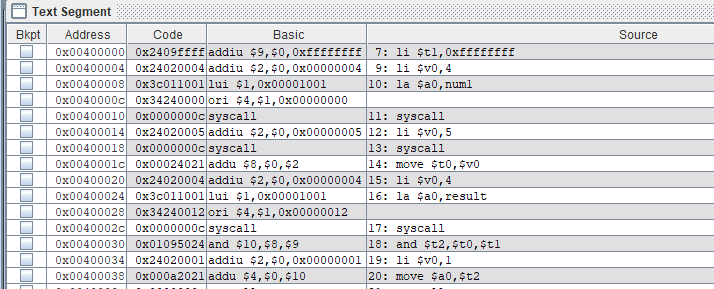
**A picture containing text

Description automatically generated**syscall

li $v0,10

syscall

**Output**



**OR WITH MASK 0**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

li $t1,0x000000000

li $v0,4

la $a0,num1

syscall

li $v0,5

syscall

move $t0,$v0

li $v0,4

la $a0,result

syscall

or $t2,$t0,$t1

**Text

Description automatically generated**li $v0,1

move $a0,$t2

syscall

li $v0,10

syscall

**Output**

Table

Description automatically generated

**NOT Bitwise Operator**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

#li $t1,0xffffffff

#li $t1,0x000000000

li $v0,4

la $a0,num1

syscall

li $v0,5

syscall

move $t0,$v0

li $v0,4

la $a0,result

syscall

not $t2,$t0

li $v0,1

move $a0,$t2

syscall

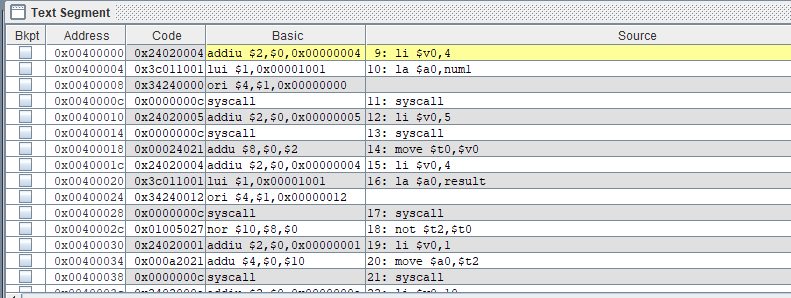
li $v0,10

syscall

**Output**

A picture containing graphical user interface

Description automatically generated



**XOR WITH MASK 1**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

li $t1,0xffffffff

#li $t1,0x000000000

li $v0,4

la $a0,num1

syscall

li $v0,5

syscall

move $t0,$v0

li $v0,4

la $a0,result

syscall

xor $t2,$t0,$t1

li $v0,1

move $a0,$t2

syscall

A picture containing text

Description automatically generatedli $v0,10

syscall

Table

Description automatically generated**Output**

**XOR WITH MASK 0**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

li $t1,0x000000000

li $v0,4

la $a0,num1

syscall

li $v0,5

syscall

move $t0,$v0

li $v0,4

la $a0,result

syscall

xor $t2,$t0,$t1

li $v0,1

move $a0,$t2

A picture containing graphical user interface

Description automatically generatedsyscall

li $v0,10

syscall

Table

Description automatically generated**Output**

**XNOR WITH MASK 1**

**Solution**

.data

mess1:.asciiz "Enter Your Number : "

res: .asciiz "Your Result Is :"

.text

main:

li $t0,0xffffffff

#li $t0,0x00000000

li $v0,4

la $a0,mess1

syscall

li $v0,5

syscall

move $t1,$v0

xor $t2,$t0,$t1

not $t3,$t2

li $v0,4

la $a0,res

syscall

move $a0,$t3

li $v0,1

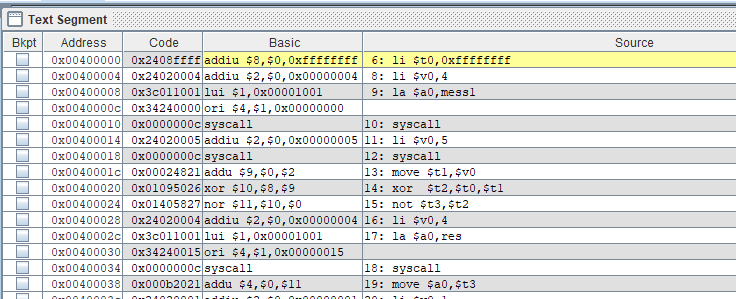
syscall

li $v0,10

**Text

Description automatically generated**syscall

**Output**



**XNOR WITH MASK 0**

**Solution**

.data

mess1:.asciiz "Enter Your Number : "

res: .asciiz "Your Result Is :"

.text

main:

li $t0,0x00000000

li $v0,4

la $a0,mess1

syscall

li $v0,5

syscall

move $t1,$v0

xor $t2,$t0,$t1

not $t3,$t2

li $v0,4

la $a0,res

syscall

move $a0,$t3

li $v0,1

syscall

Text

Description automatically generated with medium confidenceli $v0,10

syscall

**Output**

Table

Description automatically generated

**NOR WITH MASK 1**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

li $t1,0xffffffff

#li $t1,0x000000000

li $v0,4

la $a0,num1

syscall

li $v0,5

syscall

move $t0,$v0

li $v0,4

la $a0,result

syscall

nor $t2,$t0,$t1

li $v0,1

move $a0,$t2

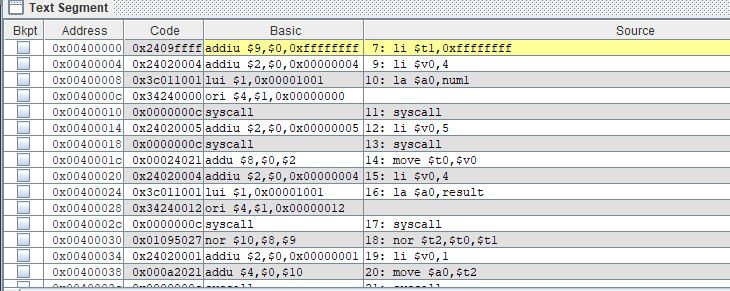
**A picture containing graphical user interface

Description automatically generated**syscall

li $v0,10

syscall

**Output**



**NOR WITH MASK 0**

**Solution**

.data

num1:.asciiz "Enter number 1 : "

result:.asciiz"The Result is : "

.text

.globl main

main:

li $t1,0x000000000

li $v0,4

la $a0,num1

syscall

li $v0,5

syscall

move $t0,$v0

li $v0,4

la $a0,result

syscall

nor $t2,$t0,$t1

li $v0,1

move $a0,$t2

syscall

**A picture containing text

Description automatically generated**li $v0,10

syscall

**Output**

Table

Description automatically generated

**NAND WITH MASK 1**

**Solution**

.data

mess1:.asciiz "Enter Your Number : "

res: .asciiz "Your Result Is :"

.text

main:

li $t0,0xffffffff

li $v0,4

la $a0,mess1

syscall

li $v0,5

syscall

move $t1,$v0

and $t2,$t0,$t1

not $t3,$t2

li $v0,4

la $a0,res

syscall

move $a0,$t3

li $v0,1

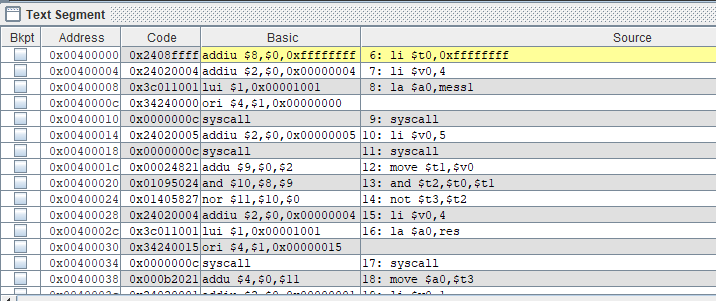
syscall

**Text

Description automatically generated**li $v0,10

syscall

**Output**

****

**NAND WITH MASK 0**

**Solution**

.data

mess1:.asciiz "Enter Your Number : "

res: .asciiz "Your Result Is :"

.text

main:

li $t0,0x00000000

li $v0,4

la $a0,mess1

syscall

li $v0,5

syscall

move $t1,$v0

and $t2,$t0,$t1

not $t3,$t2

li $v0,4

la $a0,res

syscall

move $a0,$t3

li $v0,1

syscall

**A picture containing chart

Description automatically generated**li $v0,10

syscall

**Output**

