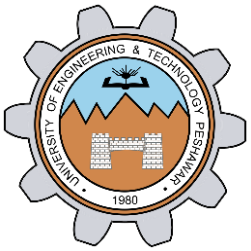
COA Lab

LAB # 04



Fall 2020

CSE304L Computer Organization and Architecture Lab

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Class Section: **B**

"On my honor, as a student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

Student Signature: _____

Submitted to:

Engr. Amaad Khalil

December 15, 2020

Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

Task1:

Take input from user and develop a CV using string instructions

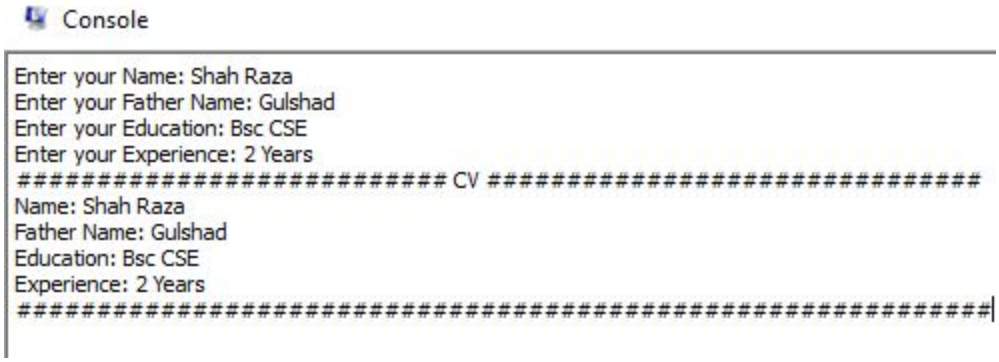
Source code:

```
.data
	CV: .asciiz"############################ CV ################################\n"
	Name: .asciiz"Name: "
	FatherName: .asciiz"Father Name: "
	Education: .asciiz"Education: "
	Experience: .asciiz"Experience: "
	End: .asciiz"#####################################################################"
	input1: .space 15
	input2: .space 15
	input3: .space 15
	input4: .space 15
	str1: .asciiz"Enter your Name: "
	str2: .asciiz"Enter your Father Name: "
	str3: .asciiz"Enter your Education: "
	str4: .asciiz"Enter your Experience: "
.text

main:

	li $v0,4	#system call to print string
	la $a0,str1	#address of string
	syscall		#syscall

	#Take string as an input
	li $v0,8
	la $a0,input1
	li $a1,15
	syscall

	li $v0,4	#system call to print string
	la $a0,str2	#address of string
	syscall		#syscall

	#Take string as an input
	li $v0,8
	la $a0,input2
	li $a1,15
	syscall

	li $v0,4	#system call to print string
	la $a0,str3	#address of string
	syscall		#syscall
```

```
#Take string as an input
li $v0,8
la $a0,input3
li $a1,15
syscall

li $v0,4          #system call to print string
la $a0,str4       #address of string
syscall           #syscall

#Take string as an input
li $v0,8
la $a0,input4
li $a1,15
syscall

li $v0,4          #system call to print string
la $a0,CV         #address of string
syscall           #syscall

li $v0,4          #system call to print string
la $a0,Name       #address of string
syscall           #syscall
li $v0,4          #system call to print string
la $a0,input1     #address of string
syscall           #syscall

li $v0,4                  #system call to print string
la $a0,FatherName         #address of string
syscall                   #syscall
li $v0,4                  #system call to print string
la $a0,input2             #address of string
syscall                   #syscall

li $v0,4                  #system call to print string
la $a0,Education          #address of string
syscall                   #syscall
li $v0,4          #system call to print string
la $a0,input3     #address of string
syscall           #syscall

li $v0,4                  #system call to print string
la $a0,Experience         #address of string
syscall                   #syscall
li $v0,4          #system call to print string
la $a0,input4     #address of string
syscall           #syscall
```

```
        li $v0,4        #system call to print string
        la $a0,End      #address of string
        syscall         #syscall

        li $v0,10       #Terminate the Program
        syscall         #syscall
```

Output:



Task2:

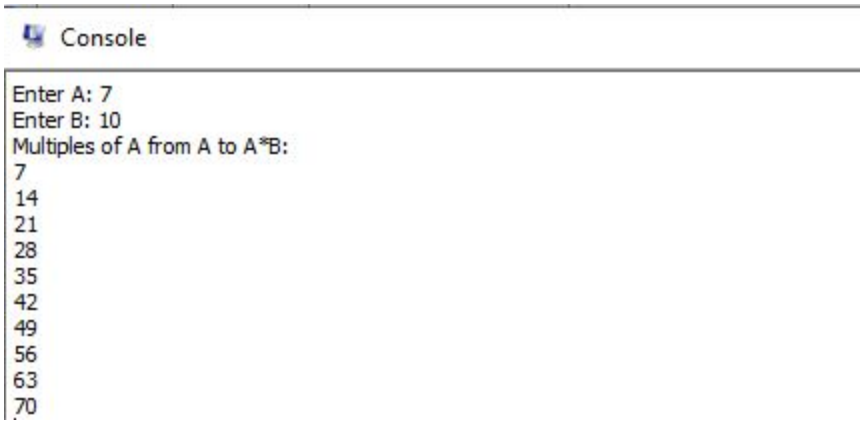
Take two numbers A and B from user, and print out all the multiples of A from A to A * B.

Source code:

```
.data
        str: .asciiz"Enter A: "
        str1: .asciiz"Enter B: "
        str2: .asciiz"Multiples of A from A to A*B:\n"
        str3: .asciiz"\n"
.text

main:
        li $v0,4        #system call to print string
        la $a0,str      #address of string
        syscall         #syscall

        li $v0,5        #Take input from the user
        syscall         #syscall
        move $t0,$v0    #move to t0

        li $v0,4        #system call to print string
        la $a0,str1     #address of string
```

```
        syscall         #syscall

        li $v0,5        #Take input from the user
        syscall         #syscall
        move $t1,$v0    #move to t1

        li $v0,4        #system call to print string
        la $a0,str2     #address of string
        syscall         #syscall

        li $t2,1  #load 1 to t2
label:
        mul $t3,$t0,$t2         #multiply t0 and t2 and store the result in t3
        move $a0,$t3            #move t3 to a0
        li $v0,1                #system call to print int
        syscall                 #syscall
        li $v0,4                #system call to print string
        la $a0,str3             #address of string
        syscall                 #syscall
        addi $t2,$t2,1          #Increment t2 by 1
        ble $t2,$t1, label      #branch if t2 is less than or equal to t1
        li $v0,10               #Terminate the program
        syscall                 #syscall
```

Output:



Task3:

Write the program that reads an integer x from the user and outputs 20x without using mul and mult. Note that you can rewrite 20x as a sum of two terms each of which multiplies x by a power of 2.

Source code:

```
.data
        str: .asciiz"Enter a Number: "
.text


main:
        li $v0,4          #system call to print string
        la $a0,str        #address of string
        syscall           #syscall

        li $v0,5          #Take input from the user
        syscall           #syscall

        move $t0,$v0      #move input to t0

        sll $t1,$t0,2     #shift left t0 by 2 and store in t1
        sll $t2,$t0,4     #shift left t0 by 4 and store in t2

        add $t3,$t1,$t2   #add t1 to t2 and store in t3

        move $a0,$t3      #move t3 to a0

        li $v0,1          #system call to print int
        syscall           #syscall

        li $v0,10         #Terminate the program
        syscall           #syscall
```

Output:

Int Regs [10]

```
PC        = 4194392
EPC       = 0
Cause     = 0
BadVAddr  = 0
Status    = 805371664

HI        = 0
LO        = 0

R0  [r0] = 0
R1  [at] = 0
R2  [v0] = 10
R3  [v1] = 0
R4  [a0] = 140
R5  [a1] = 2147480968
R6  [a2] = 2147480988
R7  [a3] = 0
R8  [t0] = 7
R9  [t1] = 28
R10 [t2] = 112
R11 [t3] = 140
R12 [t4] = 0
R13 [t5] = 0
R14 [t6] = 0
R15 [t7] = 0
R16 [s0] = 0
R17 [s1] = 0
R18 [s2] = 0
R19 [s3] = 0
R20 [s4] = 0
```

Console

```
Enter a Number: 7
140
```