**Shri G.S. Institute of Technology and Science**

**Dept. of Computer Engineering**

**CO24009 : Computer Architecture Sem A (2023-2024)**

**Lab Assignment - 03**

Q1. Write a assembly program for Hello world and print it into console.

# Purpose: First program, Hello World

.text # Define the program instructions.

main: # Label to define the main program.

li $v0,4 # Load 4 into $v0 to indicate a print string.

la $a0, greeting # Load the address of the greeting into $a0.

syscall # Print greeting. The print is indicated by

# $v0 having a value of 4, and the string to

# print is stored at the address in $a0.

li $v0, 10 # Load a 10 (halt) into $v0.

syscall # The program ends.

.data # Define the program data.

greeting: .asciiz "Hello World" #The string to print.

Q2. Write a program to read an integer number from user and print to the console.

# Program to read an integer number from a user, and

# print that number back to the console.

.text

main:

# Prompt for the integer to enter

li $v0, 4

la $a0, prompt

syscall

li $v0, 5 # Read the integer and save it in $s0

syscall

move $s0, $v0

li $v0, 4 # Output the text

la $a0, output

syscall

li $v0, 1 # Output the number

move $a0, $s0

syscall

li $v0, 10 # Exit the program

syscall

.data

prompt: .asciiz "Please enter an integer: "

output: .asciiz "\nYou typed the number "

Q3. Program to prompt and read a string from a user.

Q4. Write a program to print out a random number from 1..100.

Q5. Write a MIPS assembly program called Problem2.asm. This program should have two global variables, which stores numeric values. The program itself should sum those two values and then print the result to the console.

Q6. The program should have two temporary registers , which stores numeric values. The program must have multiply these two numbers and the result is store in the saved value registers.

Q7. Write a program to find out the square of an number and print the result to the console.

Q8. Convert the following program

.text

main:

li $v0, 4

la $a0, result1

syscall

li $v0, 4

li $a0, 4

syscall

li $v0, 4

la $a0, result2

syscall

li $v0, 1

li $a0, 8

syscall

addi $v0, $zero, 10 #Exit program

syscall

.data

result1: .asciiz "\nfirst value = "

result2: .asciiz "\nsecond value = "

Q9. Write a program to retrieve two numbers from a user, and swap those number using only the XOR operation. You should not use a temporary variable to store the numbers while swapping them. Your program should include a proper and useful prompt for input, and print the results in a meaningful manner

Q10. Write an Assembly code which take an alphabet from user and print the next and previous alphabets on the screen.

Sample input vs output:

Please enter an alphabet ? d

Previous alphabet in English grammar is : c

You have entered alphabet : d

Next alphabet in English grammar is : e

Q11. Implementation of fibonacci series program In MIPS

Q12. Write a MIPS program that inputs two integer values. The program should output equal if the two integers are equal. Otherwise, it should output not equal. Use the branch instruction to check for equality.

Q13. Variables are of type unsigned integers and word sized. Also the variables b, c, d and e are initialized to values 10, 20, 30 and 40 respectively.

a = (b + c) - (d + e)

Q14. Write MIPS Assembly Language Programs equivalent to the following C-code fragments.

1. if(a<b)

{ //a and b are signed integers  
 c = a - b;  
}

1. if(a<b)

{ // a and b are unsigned integers  
 c=a-b;  
}

1. if ( a < -1234)

{ // a is a signed integer  
 a = 4 \* a ;  
}  
else

{  
 a = a/4;  
}

15. Write a MIPS assembly for the following C codes :

int a, b, result

int main(){

a = 0x12345;

b = 7;

result = a + b;

return 1;

}