Bahria University,
Karachi Campus

LAB EXPERIMENT NO.
_05_

LIST OF TASKS

TASK NO	OBJECTIVE
1.	Convert the following Pseudocode in MIPS program:
2.	Write MIPS assembly program that takes two 2-digit hardcoded numbers (first two & last two digits of your enrollment) and then add, subtract, divide as well as multiply them and then print the result. (The user should be able to deal with decimal values).
3.	Write MIPS assembly program that calculates your age (in seconds) by taking input of your birth year.
4	Write an MIPS assembly program that computes the initial velocity, final velocity and acceleration produced in car by taking the required inputs from user.
5	Write a program that takes the radius of circle from the user and calculates the area and perimeter of the circle.

Submitted On:
Date: 10/10/2025

Task No. 01:

"Convert the following Pseudocode in MIPS program:"

```
BEGIN
    INPUT first_number
    INPUT second_number
    INPUT third_number
    sum ← first_number + second_number + third_number
    average ← sum / 3
    PRINT  average
END
```

Solution:

```
.data
  input1: .asciiz "Enter the first number: "
  input2: .asciiz "Enter the second number: "
  input3: .asciiz "Enter the third number: "
  printSum: .asciiz "The sum is "
  averageDivisor: .double 3
  printAverage: .asciiz "The average is "
  newLine: .asciiz "\n"

.text
.globl main
main:
  li $v0, 4
  la $a0,input1
  syscall

  li $v0,7
  syscall
  mov.d $f2,$f0

  li $v0, 4
  la $a0,input2
  syscall

  li $v0,7
  syscall
  mov.d $f4,$f0
```

```
li $v0, 4
la $a0,input3
syscall

li $v0,7
syscall
mov.d $f6,$f0

add.d $f8,$f2,$f4
add.d $f12,$f8,$f6

li $v0,4
la $a0,printSum
syscall

li $v0,3
la $a0,printSum
syscall

li $v0,4
la $a0,newLine
syscall

l.d $f2,averageDivisor
div.d $f14,$f12,$f2
mov.d $f12,$f14

li $v0,4
la $a0,printAverage
syscall

li $v0,3
la $a0,printAverage
syscall

li $v0,4
la $a0,newLine
syscall

 li $v0, 10
 syscall
```

Output:

```
Enter the first number: 2.2
Enter the second number: 2.2
Enter the third number: 2.2
The sum is 6.6000000000000005
The average is 2.2


-- program is finished running --
```

Task No. 02:

"Write MIPS assembly program that takes two 2-digit hardcoded numbers (first two & last two digits of your enrollment) and then add, subtract, divide as well as multiply them and then print the result. (The user should be able to deal with decimal values)."

Solution:

```
.data
num1: .double 70
num2: .double 02
resMsg:  .asciiz "\nResults: "
summ:  .asciiz "Addition :"
subtract:  .asciiz "Subtrction :"
multiply:  .asciiz "Multiplication :"
divide:  .asciiz "Division :"
newLine: .asciiz "\n"

.text
.globl main
main:
    l.d $f2,num1
    l.d $f4,num2

    add.d $f6,$f4,$f2
    mov.d $f12,$f6

    li $v0, 4
    la $a0, summ
```

```
    syscall

    li $v0, 3
    la $a0, summ
    syscall

    li $v0, 4
    la $a0, newLine
    syscall

    sub.d $f6,$f2,$f4
    mov.d $f12,$f6

    li $v0, 4
    la $a0, subtract
    syscall

    li $v0, 3
    la $a0, subtract
    syscall

    li $v0, 4
    la $a0, newLine
    syscall

    mul.d $f6,$f4,$f2
    mov.d $f12,$f6

    li $v0, 4
    la $a0, multiply
    syscall

    li $v0, 3
    la $a0, multiply
    syscall

    li $v0, 4
    la $a0, newLine
    syscall

    div.d $f6,$f2,$f4
    mov.d $f12,$f6

    li $v0, 4
    la $a0, divide
    syscall

    li $v0, 3
    la $a0, divide
```

```
    syscall

    li $v0, 4
    la $a0, newLine
    syscall

    li $v0, 10
    syscall
```

Output:

```
Addition :72.0

Subtrction :68.0

Multiplication :140.0

Division :35.0


-- program is finished running --
```

Task No. 03:

"Write MIPS assembly program that calculates your age (in seconds) by taking input of your birth year."

Solution:

```
    li $v0, 3 .data
inputYear: .asciiz "Enter your birth year:"
currentYear: .word 2025
secInYear: .word 31536000
resMsgYears:  .asciiz "Your age in years: "
resMsgSec:  .asciiz "Your age in seconds: "
newLine: .asciiz "\n"

.text
.globl main
main:


    li $v0,4
    la $a0,inputYear
    syscall

    li $v0,5
    syscall

    move $t0,$v0

    lw $t1,currentYear

    sub $t2,$t1,$t0

    li $v0,4
    la $a0,resMsgYears
    syscall

    li $v0,1
    move $a0, $t2
    syscall

    li $v0,4
    la $a0,newLine
    syscall

    lw $t3, secInYear
    mul $t4, $t2, $t3
```
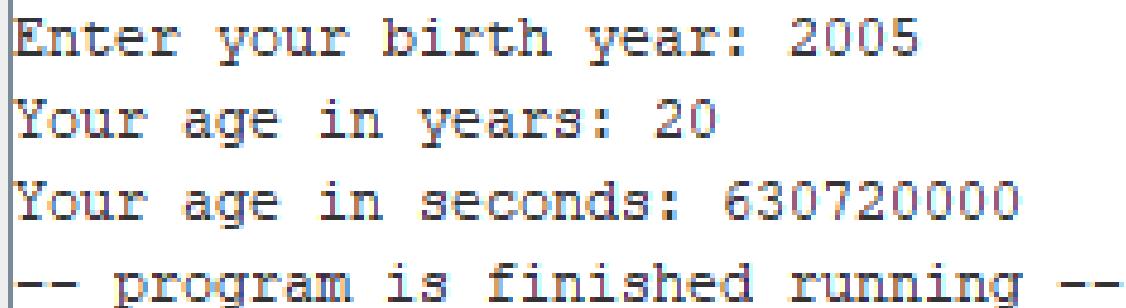
```
li $v0, 4
la $a0, resMsgSec
syscall

li $v0, 1
move $a0, $t4
syscall

li $v0, 10
syscall
```

Output:

```
Enter your birth year: 2005
Your age in years: 20
Your age in seconds: 630720000
-- program is finished running --
```

Task No. 04:

"Write an MIPS assembly program that computes the initial velocity, final velocity and acceleration produced in car by taking the required inputs from user."

Solution:

```
.data
vi: .asciiz "Enter the initial velocity: "
a: .asciiz "Enter the acceleration: "
t: .asciiz "Enter the time: "
vf: .asciiz "The final velocity of the car will be "
newLine: .asciiz "\n"

.text
.globl main
main:
 li $v0,4
 la $a0,vi
 syscall

 li $v0,6
 syscall

 mov.s $f2,$f0

 li $v0,4
 la $a0,a
 syscall

 li $v0,6
 syscall
 mov.s $f4,$f0  #a=f4

 li $v0,4
 la $a0,t
 syscall

 li $v0,6
 syscall
 mov.s $f6,$f0 #t=f6

 mul.s $f8,$f6,$f4
 add.s $f12,$f8,$f2

 li $v0,4
 la $a0,vf
```

```
syscall

li $v0,2
la $a0,vf
syscall

 li $v0, 10
 syscall
```

Output:

```
Enter the initial velocity: 23.5
Enter the acceleration: 20.2
Enter the time: 2.5
The final velocity of the car will be 74.0
-- program is finished running (dropped off bottom) --
```

Task No. 05:

"Write a program that takes the radius of circle from the user and calculates the area and perimeter of the circle."

Solution:

```
.data
radiusInput: .asciiz "Enter the radius of the circle: "
pi: .float 3.14
two: .float 2.0
area: .asciiz "The area of the circle is: "
perimeter: .asciiz "The perimeter of the circle is: "
newLine: .asciiz "\n"

.text
.globl main
main:
    li   $v0, 4
    la   $a0, radiusInput
    syscall

    li   $v0, 6
    syscall

    l.s  $f2, pi
    mul.s $f4, $f0, $f0
    mul.s $f12, $f4, $f2

    li   $v0, 4
    la   $a0, area
    syscall

    li   $v0, 2
    syscall

    li   $v0, 4
    la   $a0, newLine
    syscall

    l.s  $f6, two
    mul.s $f8, $f6, $f2
    mul.s $f12, $f8, $f0

    li   $v0, 4
    la   $a0, perimeter
    syscall
```

```
li   $v0, 2
syscall

li   $v0, 4
la   $a0, newLine
syscall

li   $v0, 10
syscall
```

Output:

```
Enter the radius of the circle: 5.6
The area of the circle is: 98.4704
The perimeter of the circle is: 35.168


-- program is finished running --
```