# School of Computer Science Engineering and Technology

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| Course- BTech | Type- Core |
| Course Code: CSET203 | Course Name- Microprocessor & Computer Architecture |
| Year- 2022 | Semester- 3rd |
| Date- | Batch- |

## Lab Assignment -3 (Set-5)

## CO-Mapping:

| Exp No. | Name | CO1 | CO2 | CO3 |
|---|---|---|---|---|
| 3 | MIPS Programming | ✓ | -- | ✓ |

The MIPS assembly language simply refers to the processor's assembly language. **Microprocessor without Interlocked Pipeline Stages (MIPS)** is an acronym for Microprocessor without Interlocked Pipeline Stages. It's a MIPS Technologies-developed reduced-instruction set architecture.

To begin, you first require an excellent Integrated Development Environment to compile and execute your MIPS assembly language code. **MARS (MIPS Assembler and Runtime Simulator)** will be used in this lab for this purpose.

**Objective:** You will learn how MARS MIPS works and will simulate some sample assembly programs. This will help you to learn assembly programming in depth.

MARS MIPS (https://courses.missouristate.edu/KenVollmar/mars/) is lightweight IDE for programming in MIPS assembly language.

It can be obtained from https://courses.missouristate.edu/KenVollmar/mars/download.htm.

Download and double click to open it (Tutorial is available in 'Help' tab).

Q1. Using MARS simulator, write a basic assembly language code for printing your name using the .asciiz' directive. (To learn more about all the directives, go to the Help tab).

Example: Let say your name is Praful Kumar, then **Praful Kumar** on output window.

Q2. Using MARS simulator, write an assembly language code that prompts a user to input a string, then reads that string into a register and prints it back to the console.

**Example: enter string: This is the string**
**The entered string is: This is the string**

Q3. Using MARS simulator, write an assembly language code that prompts a user to input floating point values for principal, time and rate and calculate Simple Interest. Print the result on console.

**The output should be: Enter value of Principal: P**
**Enter Total Time: T**

**Enter Rate: R**
**The Simple Interest is P*T*R/100.**

**Q4.** Write an assembly language code that will take two number a and b (a>b) from the user, and display the quotient and reminder after dividing a by b.

**Example: Input a is: 8**
**Input b is: 3**
**Quotient is: 2**
**Reminder is: 2**

Q5 Take the values of b, c, d from user for the following equations and convert following set of arithmetic operations into assembly instructions.

**Given code: a = b * c - d.**
**a = a + 10.**
**e = a * 5**

**Example: If value of b, c, d is taken as 5, 6, 7 in the program then after**
**1st Instruction: a = 5 * 6 – 7 = 23**
**2nd Instruction: a = 23 + 10 = 33**
**3rd Instruction: e = 33 * 5 = 165**