

# Assignment3 - Due: Friday, September 4th, 5pm

## Assignment

### CSE/EEE230 Assignment3

## Due Date

Friday, September 4th, 5pm

***Important: This is an individual assignment. Please do not collaborate.***

It must be submitted on-line (course website).

Go to "GradeScope" tab on Canvas -> CSE/EEE230 -> Assignment3, and upload your program file.

***No late assignment will be accepted***

## Minimal Submitted Files

You are required to turn in the following source file:

assignment3.s

## Objectives:

- write a MIPS assembly language program to:
  - perform arithmetic and logical operations on variables

- use **syscall** operations to display integers and strings on the console window
- use **syscall** operations to read integers from the keyboard.

## Assignment Description:

The **read\_int** system call (number 5) will cause the running program to stop and wait for the user to type in an integer at the keyboard. The integer will be put into \$v0 register and will be available after the **syscall** completes. Write a MIPS assembly language program which prompts for a user to enter four integers and calls **read\_int** four times to read in four integers. The program should perform the specified (see the C program below) addition, subtraction, multiplication, integer division, and modulo operation (compute the remainder of their division) using two of these four integers (see the C program below), then display their result on the console window. Also compute  $((num2 \% 4) + num3) * 2 / num4 + num1$  where `num1` is the first read integer, `num2` is the second read integer, `num3` is the third read integer, and `num4` is the forth read integer, and display the result.

**Name your source code file assignment3.s.**

The following shows how it looks like in a C program:

-----

```
int num1, num2, num3, num4, ans1, ans2, ans3, ans4, ans5, ans6;

printf("Enter a value:\n");

//read an integer from a user input and store it in num1
scanf("%d", &num1);

printf("Enter another value:\n");

//read an integer from a user input and store it in num2
scanf("%d", &num2);

printf ("Enter one more value:\n");

//read an integer from a user input and store it in num3
scanf("%d", &num3);

printf ("Enter one more value:\n");

//read an integer from a user input and store it in num4
scanf("%d", &num4);
```

```
ans1 = num4+num1; //addition
```

```
printf("num4+num1=%d\n", ans1);
```

```
ans2 = num1-num2; //subtraction
```

```
printf("num1-num2=%d\n", ans2);
```

```
ans3 = num4*num2; //multiplication
```

```
printf("num4*num2=%d\n", ans3);
```

```
ans4 = num1/num3; //division
```

```
printf("num1/num3=%d\n", ans4);
```

```
ans5 = num3%num1; //remainder of division
```

```
printf("num3 mod num1=%d\n", ans5);
```

```
ans6 = (((num2 % 4) + num3) * 2) / num4) + num1;
```

```
printf("(((num2 mod 4) + num3) * 2) / num4) + num1=%d\n", ans6);
```

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Here is a sample output (user input is in bold):

---

Enter a value:

**8**

Enter another value:

**5**

Enter one more value:

**11**

Enter one more value:

**-3**

num4+num1=5

```
num1-num2=3
num4*num2=-15
num1/num3=0
num3 mod num1=3
((((num2 mod 4) + num3) * 2) / num4) + num1=0
```

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***What to turn in::***

-Submit your assignment3.s file to the file submission site through the course website by the assignment deadline. You must have your name, email address, program description, and other information in the header block as it was described in the assignment 1, and your programs should be well commented.

Go to "GradeScope" tab on Canvas -> CSE/EEE230 -> Assignment3, and upload your program file.

**Grading Criteria:**

\_\_\_\_/ 5 Documentation (header with your name, your information, and program description and comments within your code)

\_\_\_\_/ 1 Indentation and spacing (easy to read)

\_\_\_\_/ 6 Required functions and functionalities implemented

\_\_\_\_/ 8 Produces correct results?

Total points: 20

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