

## Assignment 1: Computer Architecture

### Introduction

This assignment is about assembly language programming using the MIPS simulator called SPIM. User of SPIM was covered in a **Friday** tutorial session, but if you missed it there are many resources available on the Internet (e.g., <https://www.youtube.com/watch?v=r8WcV7AiLXs>). To learn the basics of assembly language programming, read the appendix from Patterson+Hennessy and try out the sample programs, both posted to resources.

### Question 1

Write a SPIM program which for a user entered integer, determines all its one-digit-positive divisors (strictly less than 10) but not 1.

*Sample I/O:*

```
Enter a number:
51840
The single digit divisors are:
```

2

3

4

5

6

8

9

Save your program as **question1.asm**

### Question 2

Assume a user wants to classify numbers in terms of whether they are “divisible by 2”, “divisible 3”, “both visible by 2 and 3” and “neither divisible by 2 nor 3”. Clearly for each integer, **only one** of the classes is **most** accurate.

Write a SPIM program which allows a user to enter 5 integers and for each of them, determines which of the mentioned classes it belongs to.

*Sample I/O:*

```
Enter a number: 58
It is divisible by 2
Enter a number: 12
It is divisible by both 2 and 3
Enter a number: 17
It is neither divisible by 2 not 3
Enter a number: 123
It is divisible by 3
Enter a number: 222
It is divisible by both 2 and 3
```

Save your program as **question2.asm**

### **Question 3**

Write a SPIM program to find weather two numbers are relatively prime.

Two integers are said to be relatively prime if there is no integer greater than one that divides them both.

*Sample I/O:*

```
Enter the first number:
14
Enter the second number:
15
The entered numbers are not relatively prime.
```

*Sample I/O:*

```
Enter the first number:
12
Enter the second number:
15
The entered numbers are relatively prime.
```

Save your program as **question3.asm**

Submit ALL asm files in a single ZIP file to the Automatic Marker.

## **Mark Weighting**

- Question 1: 30
- Question 2: 30
- Question 3: 40