

Tutorial 1 – Sample Solution

Introduction

CO 2206 Computer Organization

- **Task 1:** Read the attached article “Computer Architecture is Dead, Long Live Computer Organization”
- **Task 2:** Which of the following two codes will give better performance? Justify your choice. Both codes perform the same task of $ax = op1 \times op2$.

```
;ax = op1 x op2
xor ax,ax
mov cx,op1
mult: add ax,op2
      loop mult
.data
op1    dw 300
op2    dw 200
```

```
;ax = op1 x op2
xor ax,ax
mov cx,op1
mov bx,op2
mult: add ax,bx
      loop mult
.data
op1    dw 300
op2    dw 200
```

Answer

- The article in **Task 1** highlights the significance of Computer Organization in improving computer performance. It touches various subject matters, e.g. pipelining, that will be covered throughout the course.
- **Task 2:** The first program (on left) appears a shorter program than the program on right. However, it accesses the multiplicand (**op2**) directly from the memory in the loop. There will be $op1$ times memory accesses. The second program makes one memory access to the multiplicand (**op2**) and uses register in the loop. Reducing memory accesses improves performance, hence the program on right will perform better.