

## 1. True or False?

Circle or cross: "T" if True – "F" if False.

```
$ ls -al
```

```
dr-x--x--x 2 demo demo 4096 Oct 17 17:06 tmp
```

T / F All users can enter directory tmp/.

T / F  $2 + 2 = 3$

## 2. Answer these following questions

(a) What is your name?

(b) When is your birthday?

## 3. Fill the remaining empty "output" cells

Script	Output
<code>echo "1 2 3 4 5"   awk '{print \$1 " " " \$5}'</code>	
<code>echo abc   tr '[a-z]' '[A-Z]'</code>	

## 4. 2016-2

Page Table (Waterloo 2012). Consider this following "structure addresspace" of a 32-bit processor.

```
struct addresspace {  
    vaddr_t as_vbase1    = 0x00100000; /* text segment: virtual base addr */  
    paddr_t as_pbase1    = 0x10000000; /* text segment: physical base addr */  
    size_t  as_npages1   = 0x20;      /* text segment: number of pages */  
    vaddr_t as_vbase2    = 0x00200000; /* data segment: virtual base addr */  
    paddr_t as_pbase2    = 0x20000000; /* data segment: physical base addr */  
    size_t  as_npages2   = 0x20;      /* data segment: number of pages */  
    vaddr_t as_vbase3    = 0x80000000; /* stack segment: virtual base addr */  
    paddr_t as_pbase3    = 0x80000000; /* stack segment: physical base addr */  
};
```

When possible, translate the provided address.

Possible	Virtual Address	Physical Address	Segment
YES	0x0010 0000	0x1000 0000	text
	0x0010 FEDC		
	0x0011 0000		

## 5. 2016-2

(a) Fill this following with "ASP" (Application Software Provider) or "SaaS" (Software as a Service)

	a separate instance of the application is maintained for each business
	always Up-to-Date for the whole service
	closer to Legacy Software
	lacks scalability for the vendor
	supports multi-tenancy (multiple customers)

- (b) There exists four (4) identical processes, with this following CPU utilization table:

	<b>Multiprogramming Combination (%)</b>			
	<b>A</b>	<b>A + A</b>	<b>A + A + A</b>	<b>A + A + A + A</b>
<b>CPU utilization per proses A</b>	10	9.5	9	8.6

The CPU time of each processes is 43 seconds Print the output when the system runs:

How long will be the total time to run concurrently all (4) processes together?!