

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

### 4. 2016-2

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

```
struct addrspace {
    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?!