ICS Homework 10

November 26, 2019

1 Struct and Union

Please answer the following questions according to the definition of the union.

```
union ele {
    struct s1 {
        char cc;
        union ele *next;
        short ss;
        long long int li;
    } e1;
    int i;
    struct s2 {
        char c;
        struct s1(*f)(int i, short s, long l);
        char str[3];
        short s;
        int *p[2];
        char c2;
        int ii;
    } e2;
} u;
```

1. Fill in the following blocks. (please represent address with hex)

sizeof(u.e1)	
sizeof(u.e2)	
sizeof(union ele)	
u	0x601060
u.e1.next	
u.e1.li	
u.e2.f	
u.e2.p[1]	

2. How many bytes are WASTED in struct s2 under x86-64? If you can rearrange the declarations in the struct s2, how many bytes of memory can you SAVE in struct s2 compared to the original declaration under x86-64?

2 Array and Pointer

Please answer the following questions and explain why. Assume we use x86-64 machines.

1. Is the value of `&(a[1])` equals to value of `(b+1)`?

```
1 int a[2]; char *b = a;
```

2. Is the value of `&(a[1])` equals to value of `(b+1)`?

```
1 int a[2]; char **b = a;
```

3. Is the value of `&(a[1])` equals to value of `(b+1)`?

```
1 int *a[2]; char **b = a;
```

4. Is the value of `&(a[1])` equals to value of `(b+1)`?

```
1 int a[2]; char (*b)[2][2] = a;
```

5. Is the value of `&(a[1])` equals to value of `(b+1)`?

```
1 int a[2]; char (**b)[2][2] = a;
```

6. What is `a`?

```
1 int *(*a[3])(int *, int);
```