# Homework 6

## 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 ss, long long int li);
        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) | 32 |
| sizeof(u.e2) | 48 |
| sizeof(union ele) | 48 |
| u | 0x601060 |
| u.e1.next | 0x601068 |
| u.e1.li | 0x601078 |
| u.e2.f | 0x601068 |
| u.e2.p[1] | 0x601080 |

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?

# Pointers and array

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

2. Is the value of &(a[1]) equals to value of (b+1) when
   ```
   int a[2]; char **b = a;
   ```

3. Is the value of &(a[1]) equals to value of (b+1) when
   ```
   int *a[2]; char **b = a;
   ```

4. Is the value of &(a[1]) equals to value of (b+1) when
   ```
   int a[2]; char (*b)[2][2] = a;
   ```

5. Is the value of &(a[1]) equals to value of (b+1) when
   ```
   int a[2]; char (**b)[2][2] = a;
   ```

6. What is a?
   ```
   int *(*a[3])(int *, int);
   ```