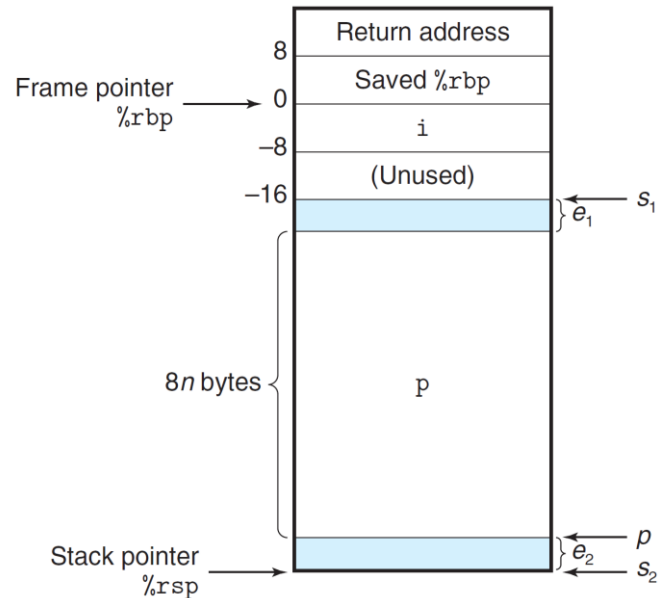# ICS Homework 12

Stack Frame

Consider the function `vframe` mentioned in class, given the exact `s1`(address of `-16(%rbp)`) and `n`(number of elements in the array), we can calculate the value of `e1`, `e2`, `s2` and `p` accordingly. Now some modifications are done for `vframe`, please read codes and the frame stack given below, and answer the following questions.

```
#define TYPE long
void vframe_new(long n) {
  long i;
  TYPE p[n];
  // do something...
}
```

```
1.vframe_new:
2.     pushq     %rbp
3.     movq      %rsp, %rbp
4.     subq      $16, %rsp
5.     leaq      22(,%rdi,8), %rax
6.     andq      $-16, %rax
7.     subq      %rax, %rsp
8.     // do something...
```


1. Why there exists `e1` and `e2` has been discussed in class. For the given `n` and `s1` below, calculate the value of `e1`, `e2`, `s2` and `p`.

n	s1	s2	p	e1	e2
3	2145				
4	2146				
5	2146				
6	2145				

2. For the following definition of TYPE, how will things become? (HINT: the assembly code may change)

    a)

    ```
    #define TYPE int
    ```

n	s1	s2	p	e1	e2
3	2145				
4	2146				
5	2146				
6	2145				

b)

```
struct f{
    int a;
    union{
        void *b_1;
        char b_2[10];
    }b;
};
#define TYPE struct f
```

n	s1	s2	p	e1	e2
3	2145				
4	2146				
5	2146				
6	2145				