CS 24

Introduction to Computing Systems

x86-64 Stack & Memory

Lecture on Friday is ONLINE!! :(

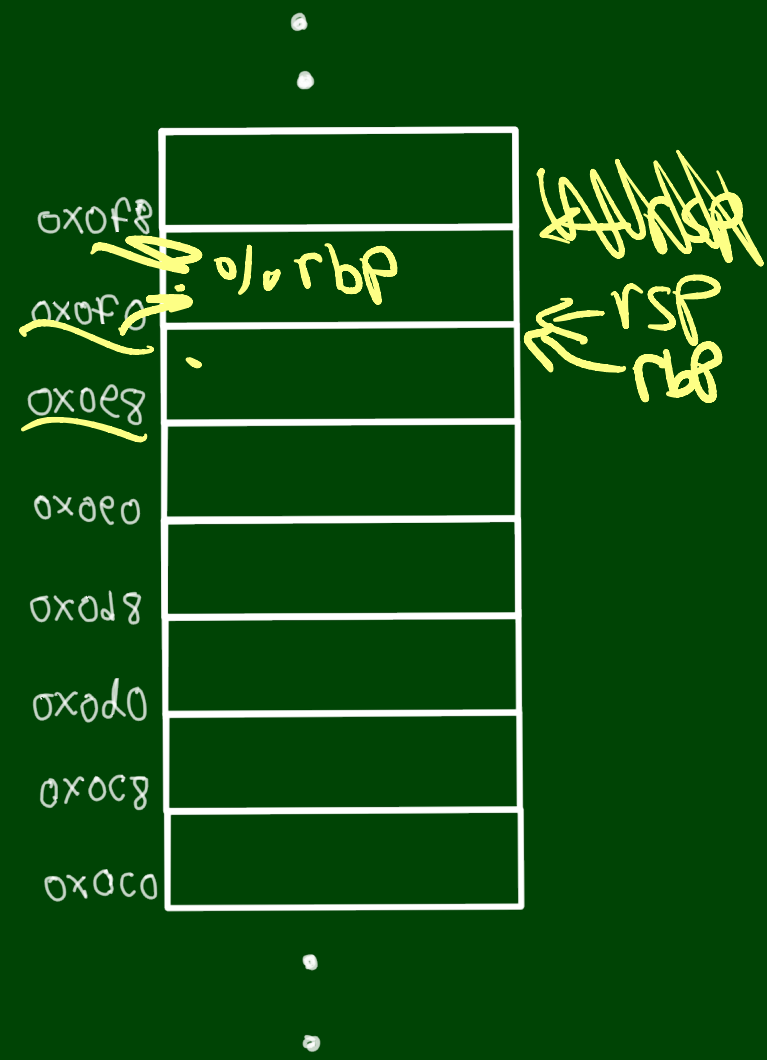
```
movzwl (%rdi),%eax
movzwl (%rsi),%edx
mov %dx,(%rdi)
mov %ax,(%rsi)
retq
```

Project 2a has two parts:
(a) bomb (0.5 week)
(b) asmgen (1.5 week)
Due dates are both Monday.

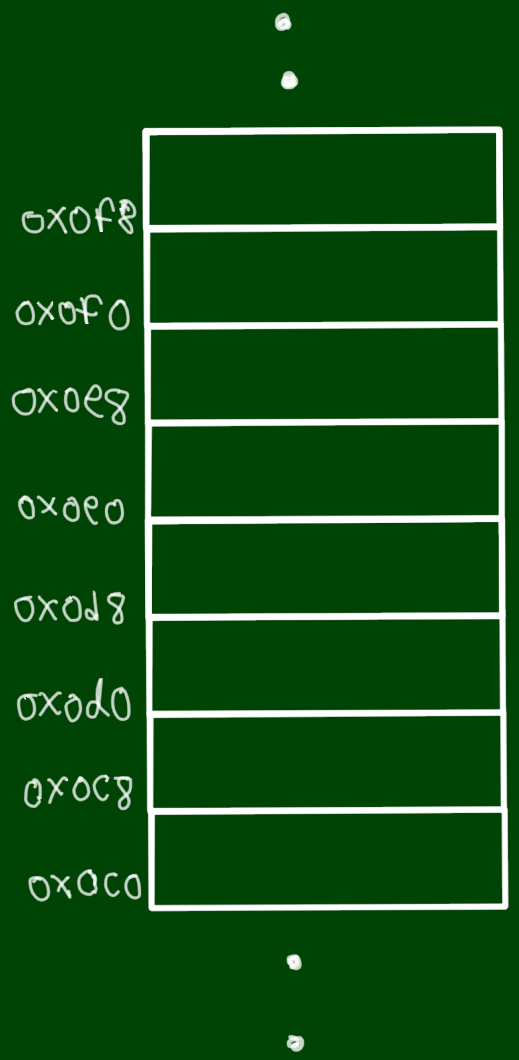
locals() {
int64_t x = 10;
}

```
locals:
    pushq   %rbp
    movq    %rsp, %rbp
    movq    $10, -8(%rbp)
    movq    -8(%rbp), %rax
    popq    %rbp
    retq
```

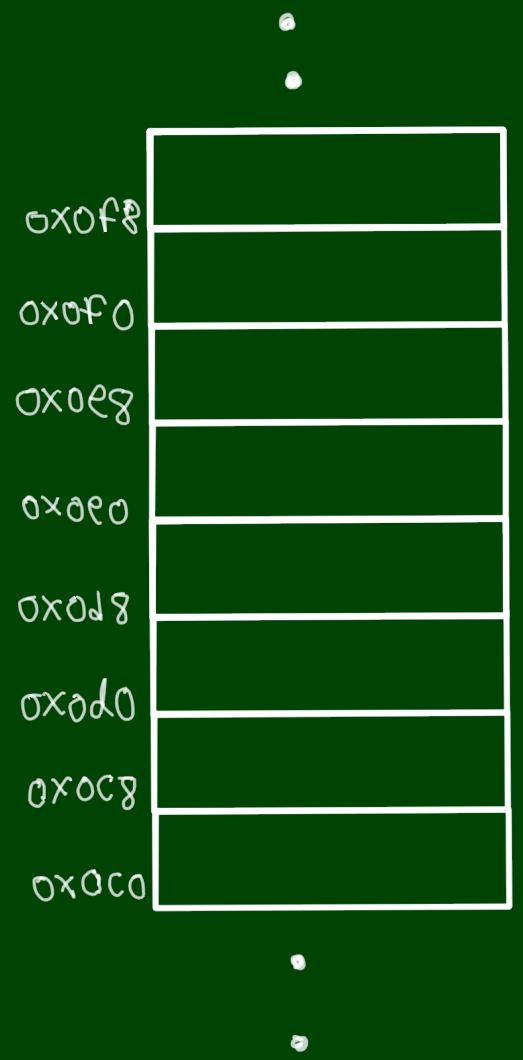
rbp = rsp



```
callee:
   pushq %rbp
   movq  %rsp, %rbp
   movq  %rdi, -8(%rbp)
   movq  -8(%rbp), %rax
   popq  %rbp
   retq
caller:
   pushq %rbp
   movq  %rsp, %rbp
   subq  $16, %rsp
   movq  %rdi, -8(%rbp)
   movq  -8(%rbp), %rdi
   callq callee
   addq  $1, %rax
   addq  $16, %rsp
   popq  %rbp
   retq
```



```
callee:
   pushq %rbp
   movq  %rsp, %rbp
   movq  %rdi, -8(%rbp)
   movq  -8(%rbp), %rax
   popq  %rbp
   retq
caller:
   pushq %rbp
   movq  %rsp, %rbp
   subq  $16, %rsp
   movq  %rdi, -8(%rbp)
   movq  -8(%rbp), %rdi
   callq callee
   addq  $1, %rax
   addq  $16, %rsp
   popq  %rbp
   retq
```



```
gcd:
   mov  %rdi,%rax
   test %rsi,%rsi
   jne  L
   repz retq
L:
   sub  $0x8,%rsp
   mov  %rsi,%rdi
   cqto
   idiv %rsi
   mov  %rdx,%rsi
   callq gcd
   add  $0x8,%rsp
   retq
main:
   sub  $0x8,%rsp
   mov  $0x5,%esi
   mov  $0xa,%edi
   callq gcd
   mov  %rax,%rsi
   ...
```