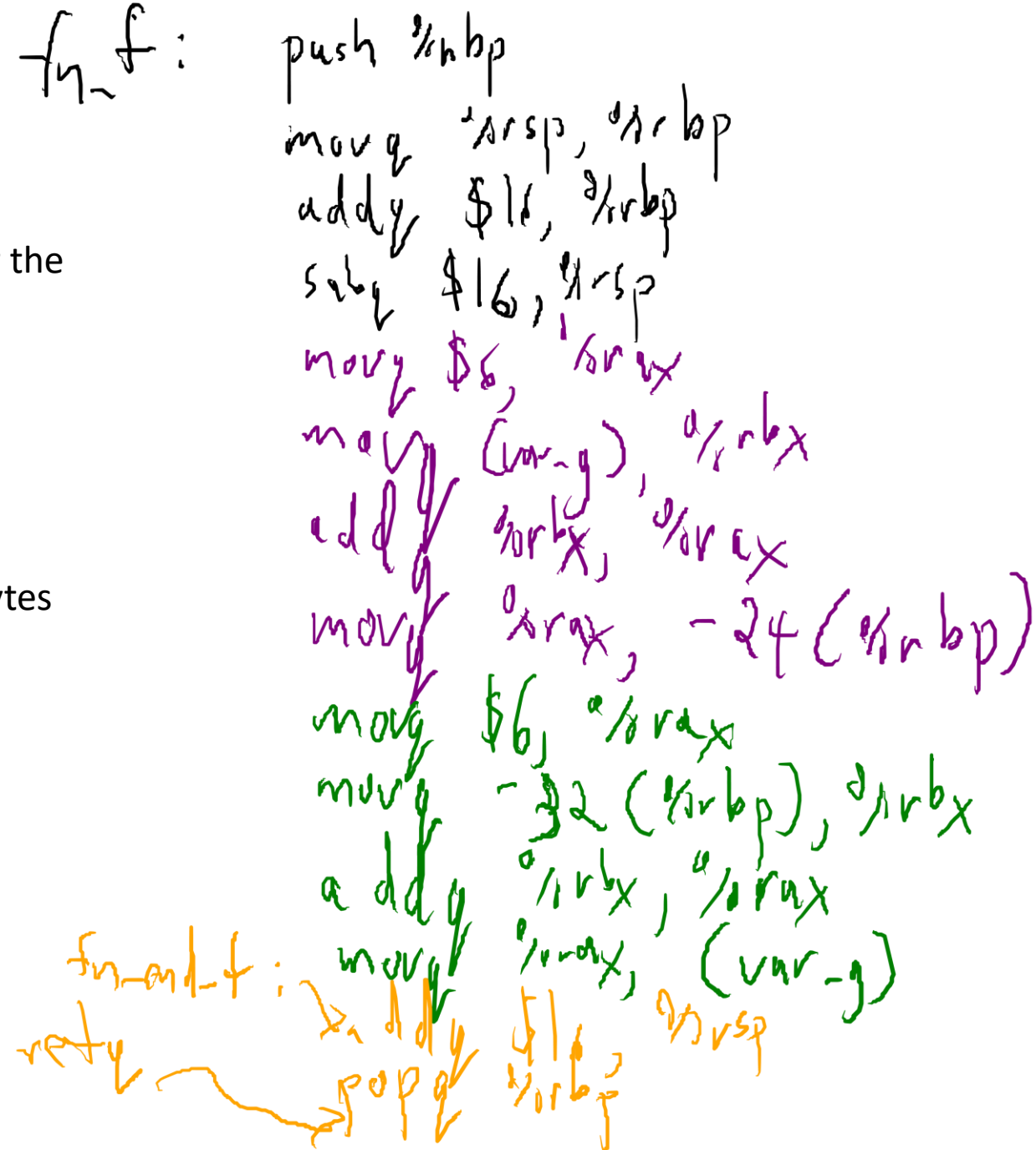
Check-in #28

Write the code that a compiler might output for the following 3AC code:

```
enter f
[a] := 6 ADD64 [g]
[g] := 6 ADD64 [b]
leave f
```

Assume: a is the first local in f and occupies 8 bytes
b is the second local in f and occupies 8 bytes
g is a global at label var_g
There are only 2 locals in f



Flipped Wednesday

Administrivia

Project 6 ← +14 days
Mid-semester review: https://compilers.cool/midpoint

quiz 3

Written Work #8 Topics

Semantics
Starting x64

W8 – Question 1

Create x64 code for the following program

```
1  int a;
2  int b;
3  int main(){
4          a = 3;
5          b = 1;
6          while (b < a){
7                  b = b + 1;
           }
8          return 0;
   }
```

3 main: enter main

4 [a] := 3

5 [1] := 1

6 LBL_0: [tmp0] := [1] LT64 [a]
if [tmp1] goto LBL_1

7 [b] := [1] ADD64 1

6 goto LBL_0

7.5 LBL_1: nop

8 return 0
goto fn_end_main

9.5 fn_end_main: leave

```
.data
var_a: .quad 0
var_b: .quad 0
.text:
.global main
main: pushq %rbp
movq %rsp, %rbp
addq $16, %rsp
subq $8, %rsp
movq $3, (var_a)
movq $1, (var_b)
```

cmpq $0, %rax
je LBL_1

movq -24(%rbp), %rax

movq $0xFF, %rax
andq
cmpq %rbx %rax
setlt %al

LBL_0: movq (var_b) %rax
movq (var_a), %rbx

W8 – Question 2

Briefly explain why compilers that use a static allocation scheme have difficulty implementing recursion.

W8 – Question 3

What is a semantic gap?

W8 – Question 4

What is the 2s complement, 4-byte representation of the value 47 in MSB and LSB?