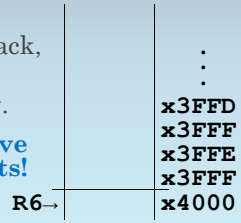
When R6 Points to Base of Stack, Stack is Empty

Initially,
- R6 points to "base" of stack,
- let's say address x4000,
- and the **stack is empty**.

What is in memory above the top of the stack? Bits!
Hint: not "air," nor "blanks."

By convention, **those bits are NOT on the stack**.



To "Execute" a Number Instruction, Push Onto Stack

Let's run our program again:

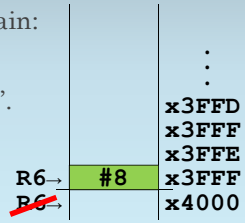
8 9 × 12 + 2 ÷

The first instruction is "8".

How can we put an "8" on the stack?

; Assume 8 in R0.
ADD R6,R6,#-1 ; make space first!
STR R0,R6,#0 ; then store the 8

called a "push"



Pushing R0 Always Uses the Same Two Instructions

Continue executing!

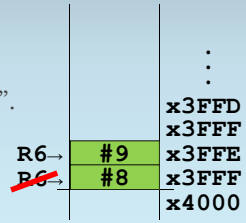
8 9 × 12 + 2 ÷

The next instruction is "9".

How can we put a "9" on the stack?

; (Put 9 in R0 here.)
ADD R6,R6,#-1 ; make space first!
STR R0,R6,#0 ; then store the 9

same two inst.!



The Next Instruction is Multiply

What about multiply?

8 9 × 12 + 2 ÷

Assume that someone has written a multiply routine:
- subroutine MULT
- R0, R1 input operands
- R0 output (R0 ← R0 × R1)