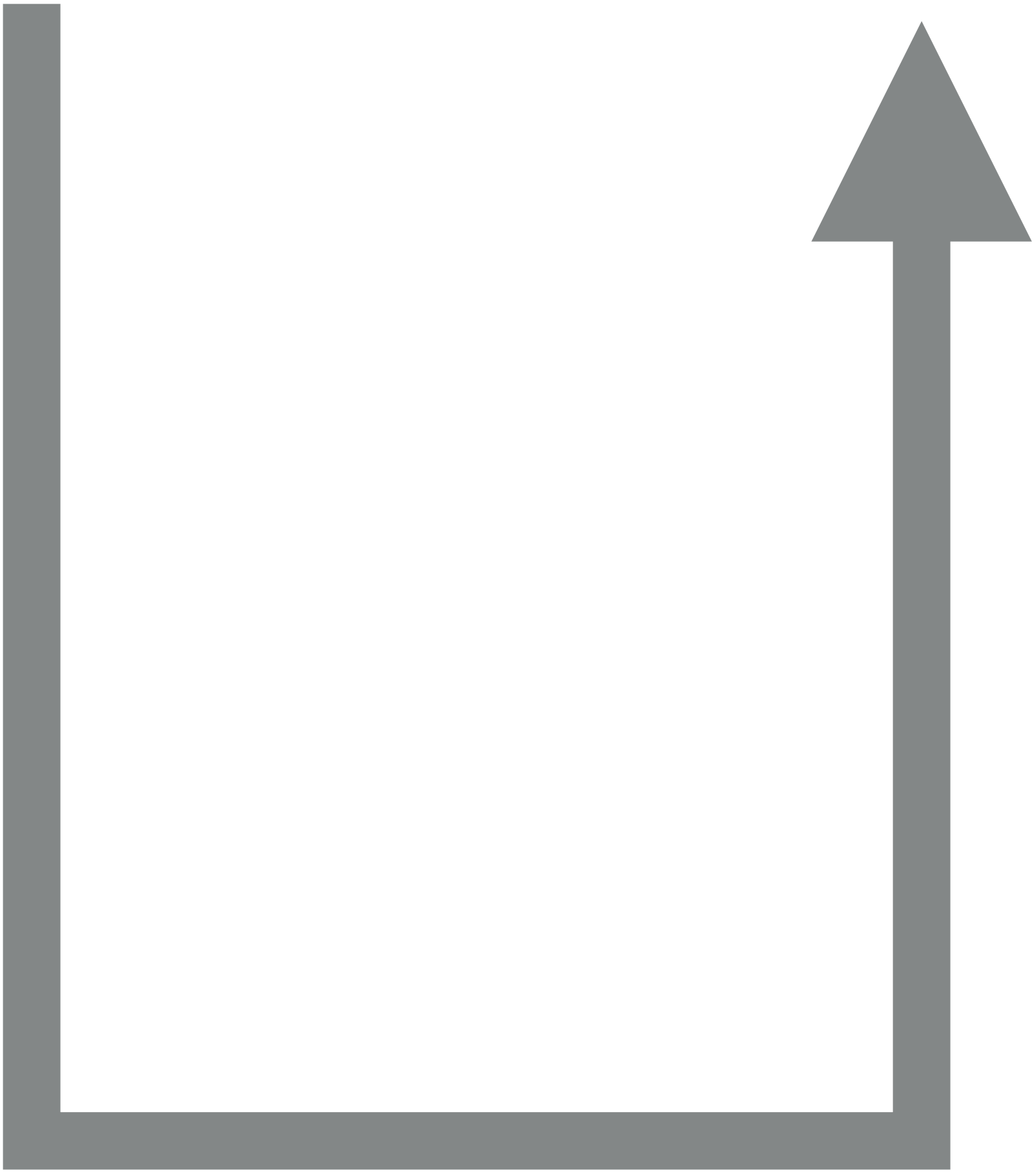
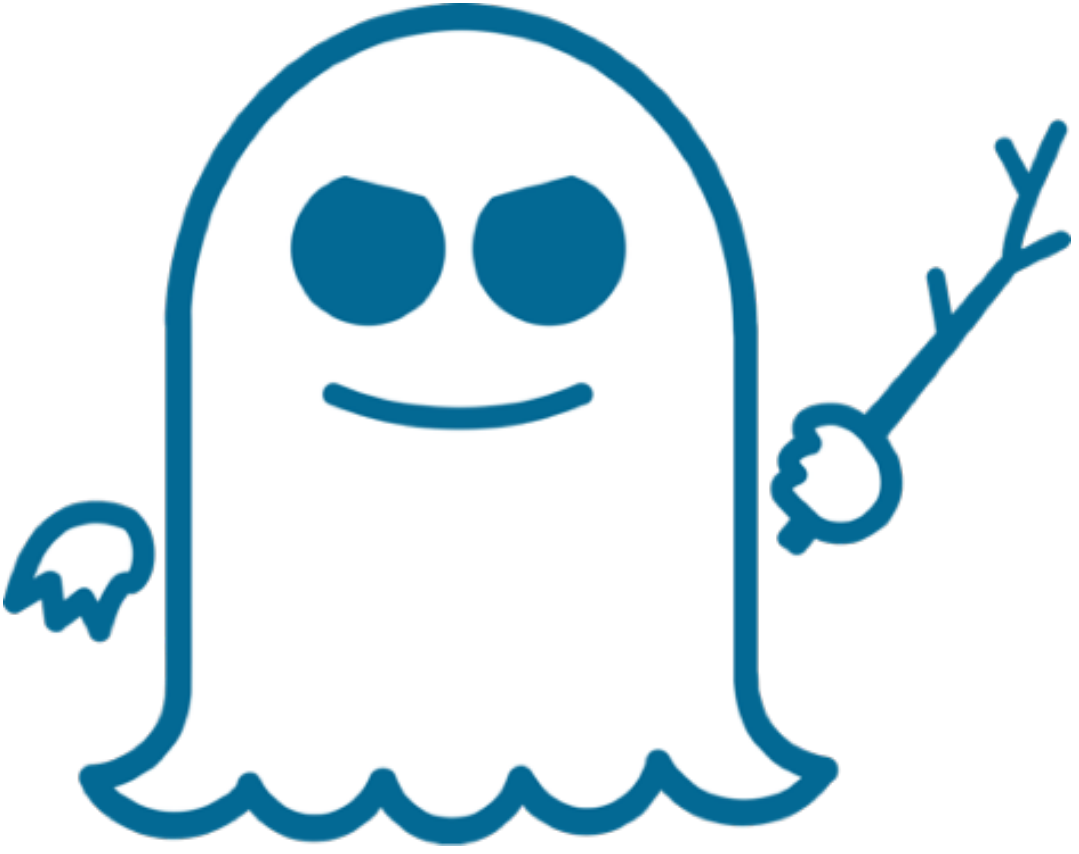
VICTIM PROCESS





MELTDOWN & SPECTRE FOR NORMAL PEOPLE

SPECTRE: SPECULATIVE EXECUTION

41

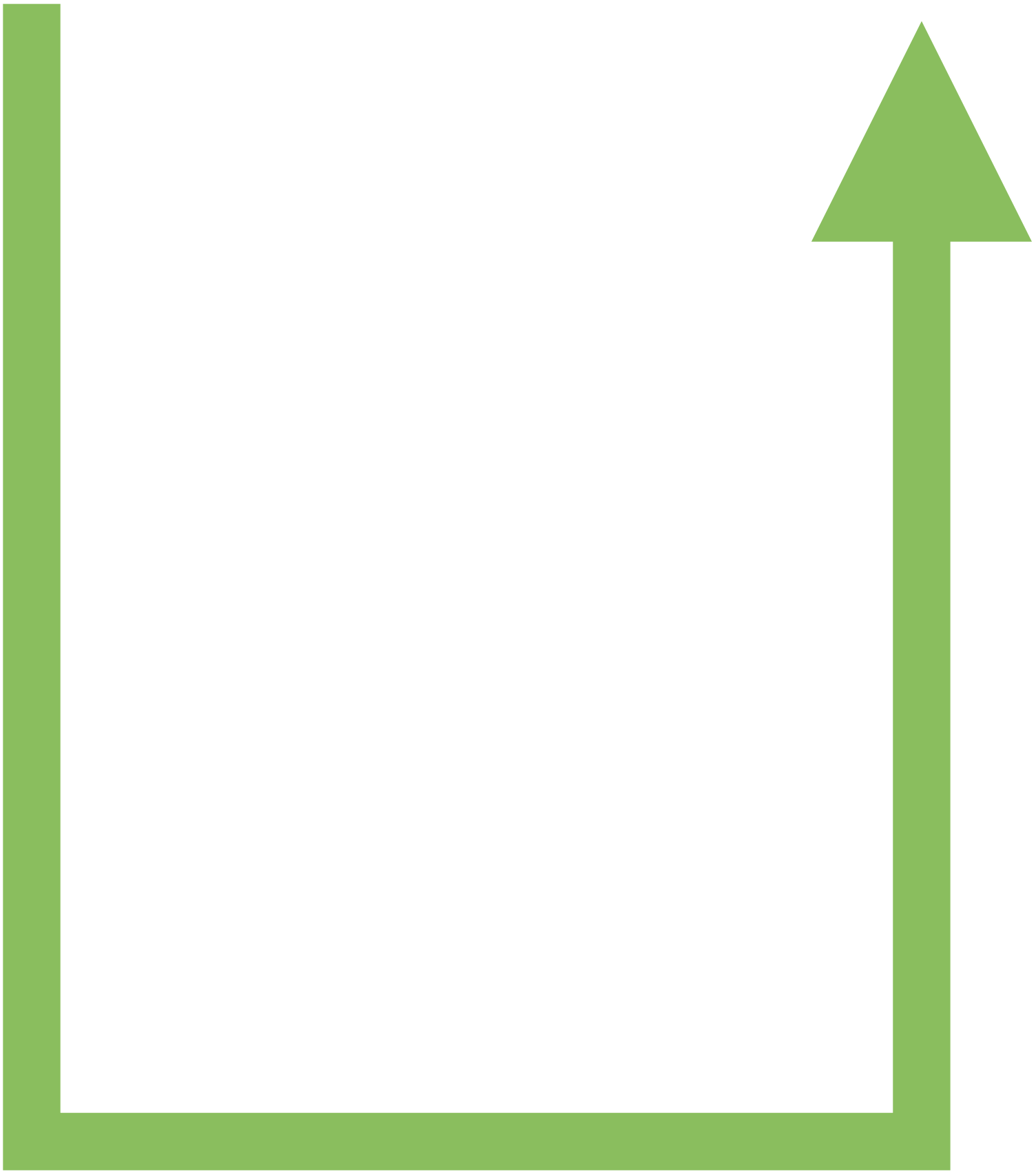

A

B


C


D


E



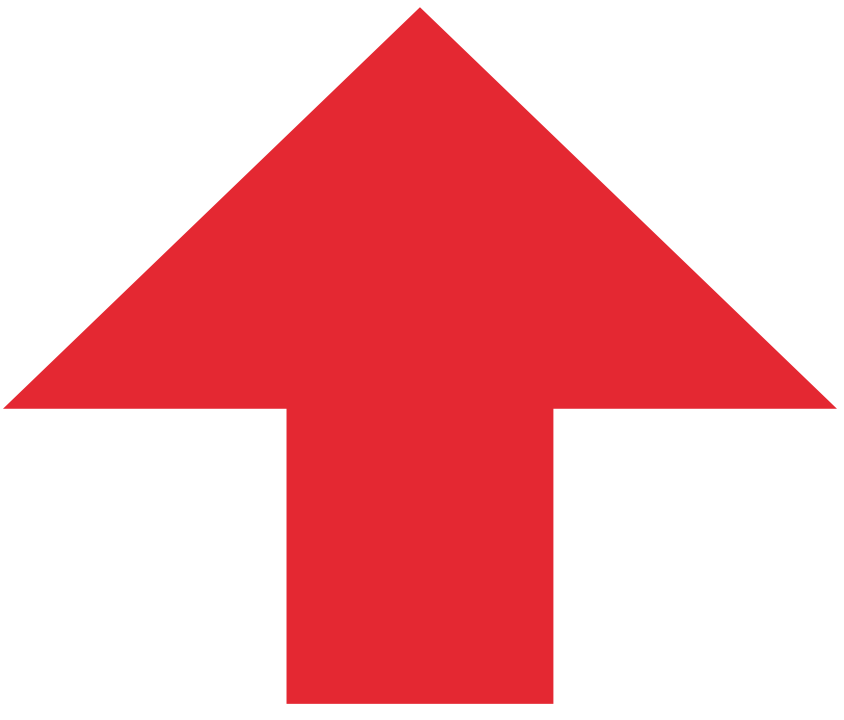
D

Attacker can influence the CPUs branch prediction of victim.

Making the victim *speculatively* execute “wrong” code.

E.g. loop even when Counter is == 0.

ATTACKER PROCESS



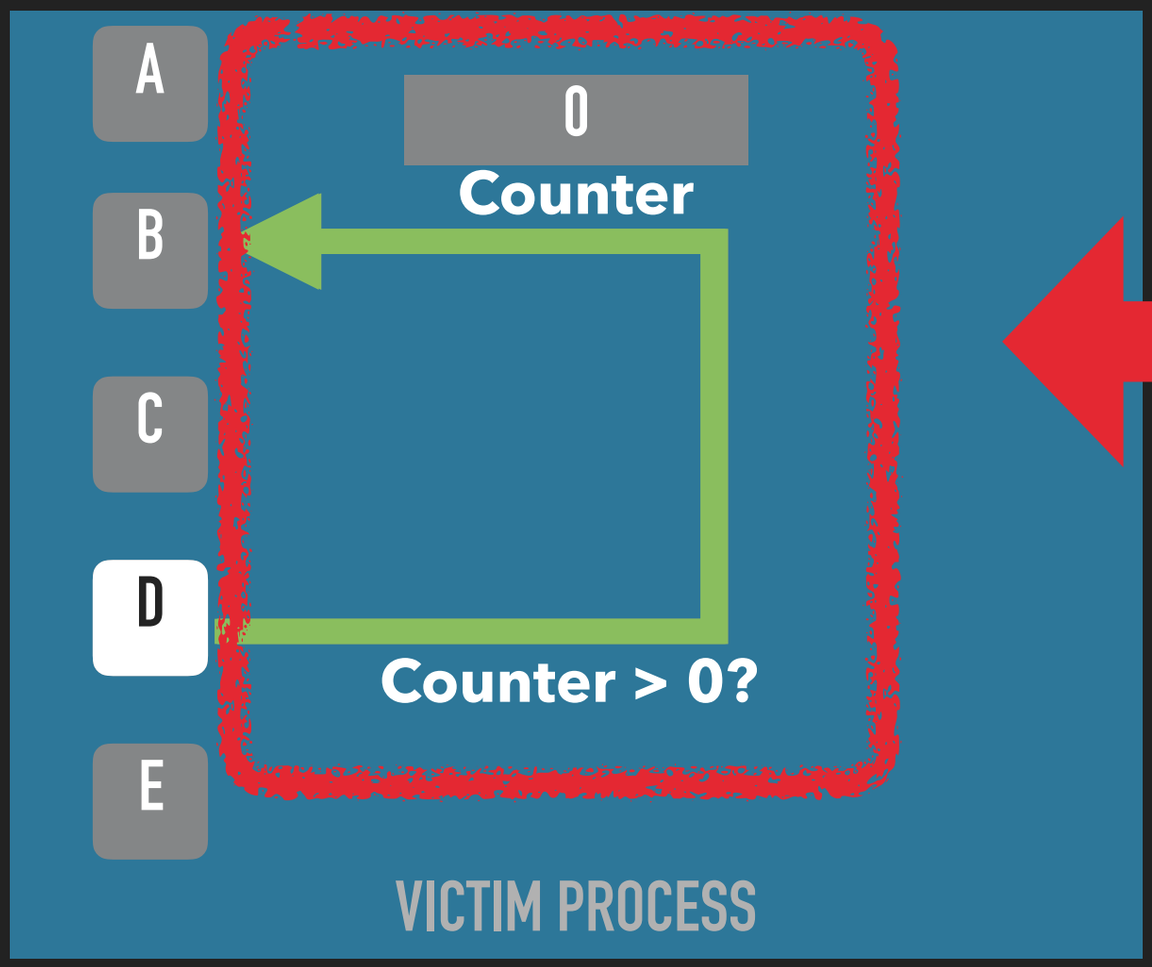
0

SPECTRE: VARIANT 1 (CVE-2017-5753)

```
if (x < array1_size)
        y = array2[array1[x] * 256];
```

- This is code of the victim
- x is controlled by the attacker
- attacker wants to read array1[x] out of bounds
- array2 is used to leak the value of y (like in Meltdown)

SPECTRE: SPECULATIVE EXECUTION



1. **Prime the branch prediction to expect a loop**
2. **Make sure *Counter* is not cached so the CPU is more likely to *speculatively* run the code**
3. **Find a way that victim leaks data when B & C are executed speculatively**

ATTACKER PROCESS

Attacker can influence the CPUs branch prediction of victim.

Making the victim *speculatively* execute “wrong” code.

E.g. loop even when Counter is == 0.