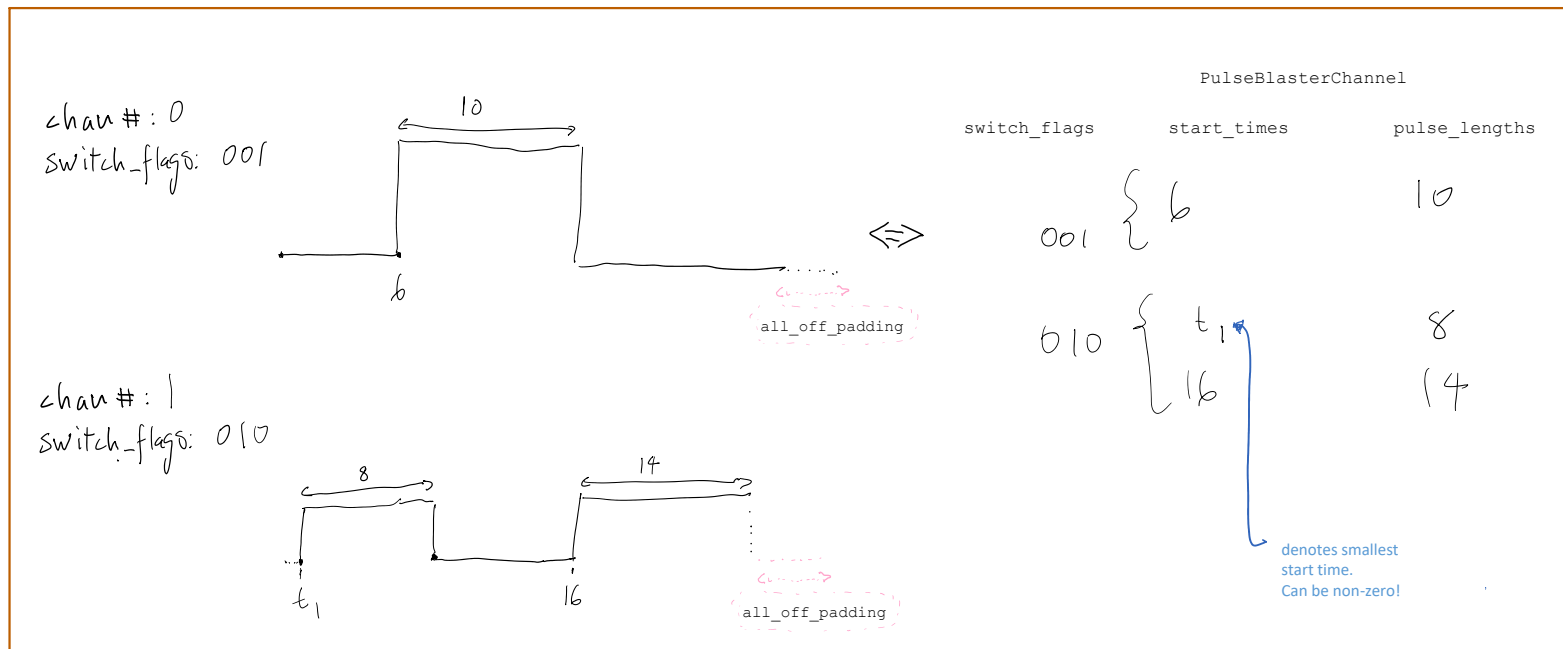_create_insts_lengths(channels: List[PulseBlasterChannel], all_off_padding:int=0)
  - Is an intermediate step to generate pb instructions:
    ○ Generates two array of equal lengths called inst_lengths and switch_falgs
    ○ Inst_lengths are durations of a instructions
    ○ Switch_flags are flags that toggle the state of the channel i.e: off-> to on and on-> off.
  - This two array allows to compute the output state of pulse blaster.

# Example of desired pulse program

chan #: 0
switch_flags: 001

chan #: 1
switch_flags: 010

10

6

8

14

$t_1$

16

all_off_padding

all_off_padding

<=>

PulseBlasterChannel

| switch_flags | start_times | pulse_lengths |
|---|---|---|
| 001 | { 6 | 10 |
| 010 | { $t_1$ | 8 |
|  | { 16 | 14 |

denotes smallest start time. Can be non-zero!

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_create_insts_lengths(channels: List[PulseBlasterChannel], all_off_padding:int=0)

1. Combine all PulseBlasterChannels

in ns

| unsorted_times | unsorted_switch_flags |
|---|---|
| 6 | 001 |
| 16 | 001 |
| $t_1$ | 010 |
| $t_1+8$ | 010 |
| 16 | 010 |
| 30 | 010 |

Each channel is switched on and off

2. Prepend (0, 000) & sort w.r.t. time

| times | switch_flags |
|---|---|
| 0 | 000 |
| $t_1$ | 010 |
| 6 | 001 |
| $t_1+8$ | 010 |
| 16 | 001 |
| 16 | 010 |
| 30 | 010 |

the final switch flag switches off last high channel. In other words, all channels will be off after it is processed.

prepend (0, 000) such that all channels can be low @ $t < t_1$

We can add many 000 we want since $000 \land x = x$
⇒ $000 \land$ is identity operator

3. Diff times to get instruction lengths.

| inst_lengths | switch_flags |
|---|---|
| $t_1$ | 000 |
| $6-t_1$ | 010 |
| $t_1+2$ | 001 |
| $8-t_1$ | 010 |
| 0 | 001 |
| 14 | 010 |
| <-----> | 010 |

Insert all_off_padding length here.

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