[HW4_prob1] Resnet-20 Post-training Quantization (10pts)

- Apply quantization for all the conv's weights by applying the functions in HW3_prob1's Resnet-20 by using following for loop.

```
for layer in model.modules():
        if isinstance(layer, torch.nn.Conv2d):
```

- Try 4 bit and 8 bit quantizations
- Report your observation
- Download the notebook as pdf and submit it

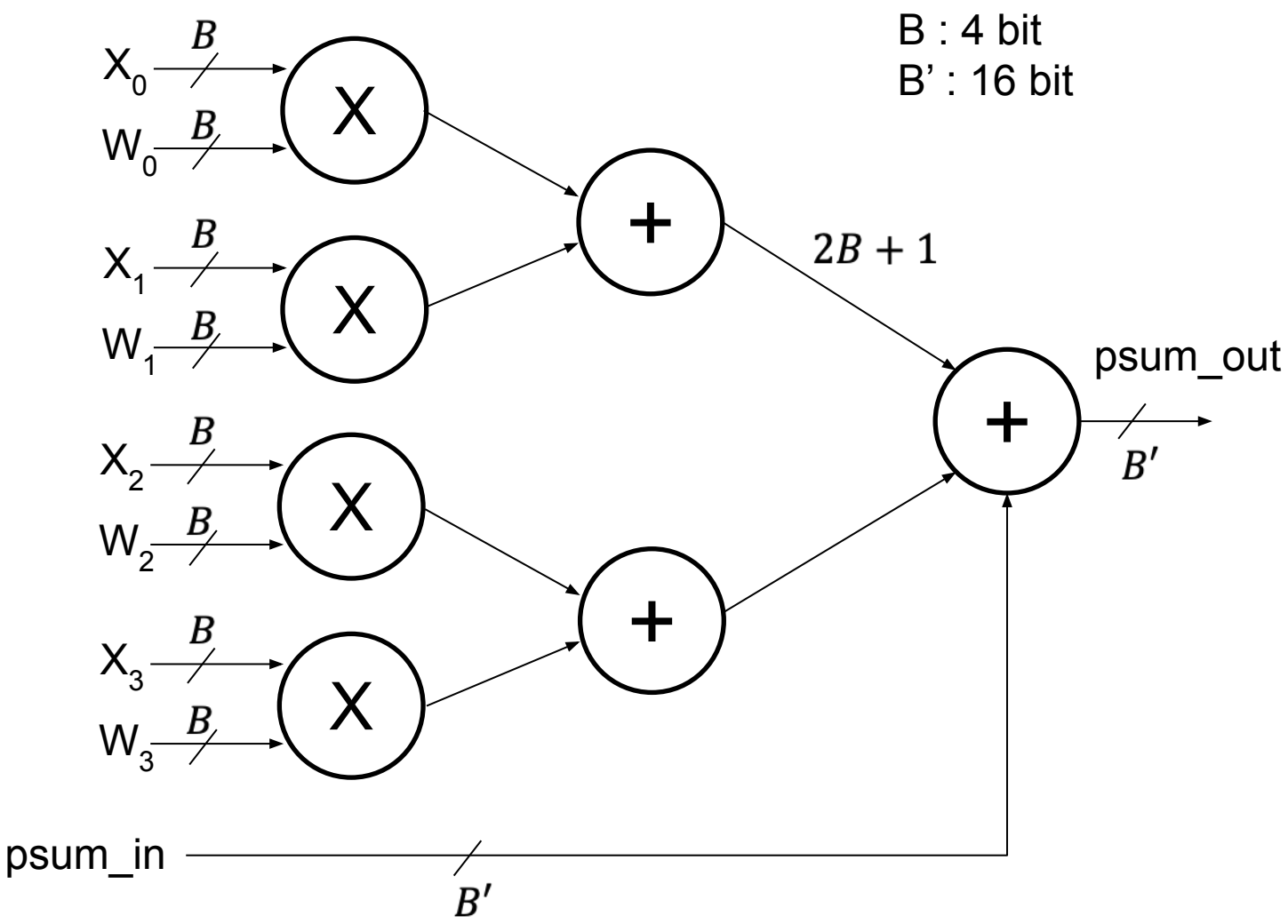
[HW4_prob2] MAC Design (A)(10pts)

- Weight: 4-bit signed
- Activation: 4-bit **unsigned**
- psum / output: 16-bit

- Please fill out the empty part in hw/w3/prob3/verilog to support above number representation
- Need to create another “dec2bin” function in testbench for unsigned number (w_bin and x_bin)
- Need to modify “mac_predicted” function accordingly for sign * unsign multiplication
- Now, a_data.txt includes only positive numbers.

- Include your *.v files and capture the final waveform to show output

[HW4_prob3] MAC Design (B)(10pts)



- Now extend your previous solution to support the left schematic
- Again, your psum_out bit precision is 16 bit
- Use the first four numbers in a_data.txt as x0, x1, x2, x3. Then, the next four numbers are x0, x1, x2, x3 for the following cycle.
- You need to modify both _tb.v and other *.v files accordingly.
- Include your *.v files and capture the final waveform to show output
- all the multiplication and accumulation should happen in 1 cycle.