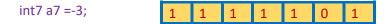
Digital System Design with High-Level Synthesis in FPGA

Integer Arithmetic: Exercises Solution

www.highlevel-synthesis.com

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```
4-
       uint10 ua10 = 5;
                                              0
                                                  0
                                                       0
                                                           0
                                                                0
                                                                         0
       int7 a7 =-8;
        uint13 ua13 = ua10+(uint7)a7;
   5-
#include <ap_int.h>
void single_perceptron_nn (
             ap_int<8> x1,
             ap int<8> x2,
             ap_int<8> x3,
             float w1,
             float w2,
             float w3,
             float b,
             bool &y) {
#pragma HLS INTERFACE ap_ctrl_none port=return
#pragma HLS INTERFACE ap_none port=x1
#pragma HLS INTERFACE ap_none port=x2
#pragma HLS INTERFACE ap_none port=x3
#pragma HLS INTERFACE ap none port=w1
#pragma HLS INTERFACE ap none port=w2
#pragma HLS INTERFACE ap_none port=w3
#pragma HLS INTERFACE ap_none port=b
#pragma HLS INTERFACE ap_none port=y
      float s = w1*x1 + w2*x2 + w3*x3 + b;
      if (b >= 0) {
             y = 1;
      } else {
             y = 0;
}
```