Assignment 7. General Purpose Register Drawing

MIPS processor has a register file that contains 32 registers. Each register is 32-bit long.

We suggest general purpose register file having the following inputs:

clk, write_enable - 1-bit long

addrA, addrB, addrC

data_out_A, data_out_B, data_in_C – 32 bit long

General purpose register file has 3 ports. A port consists of an address and data input/output.

Value of Register specified by addrA/B will be assigned to data_out_A/B. Thus, A and B are read ports.

Value of data_in_c should be assigned to Register specified by addrC. Thus, C is a write port.

Draw digital Diagram for logic associated with general purpose register file. We do not ask you to draw registers on D flip flop level because 32 bit long 32 registers use 32 x 32 = 1024 flipflops. You can represent register file with a rectangle. Make sure to show inputs and outputs of that register file.

1) **Size of addresses**: If we have 32 registers, what should be size of address bus (addrA/B)?

2) **Read Registers:** Draw a rectangle, representing register file and attach inputs and outputs to it. Also indicate size (number of bits) of inputs and outputs on your drawing.
3) **Register 0:** In your drawing implement digital circuit that makes sure that register $0 stays 0 all the time.