

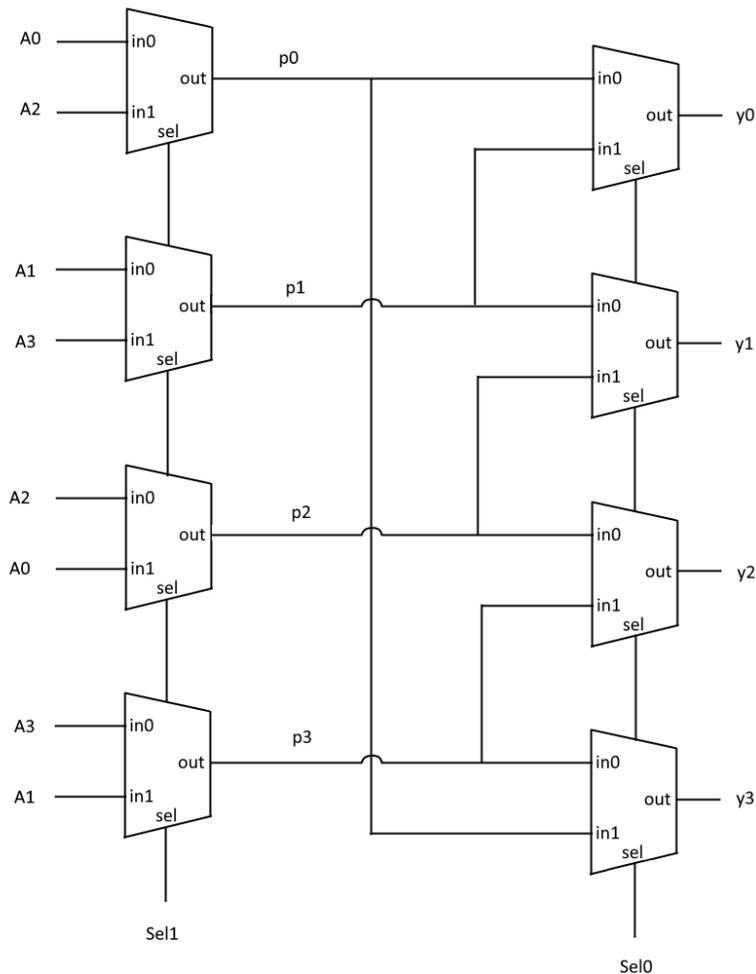
Lab 3 Bonus Problem: Barrel Shifter

A barrel shifter is a circuit that can shift or rotate a binary word or nibble by any number of bit positions in a single operation. Unlike a basic shift register, it does not shift by one operation per clock cycle, it shifts all bits combinationaly at once

For a 4-bit input and 2-bit select, a barrel shifter can shift all bits left of right by 0 to 3 positions.

Either create your own multiplexers or add the two files under module 7 to your project. Build the Project as shown in diagram and fill in the table below. For the select K, describe the intermediate output P and output Y in terms of A.

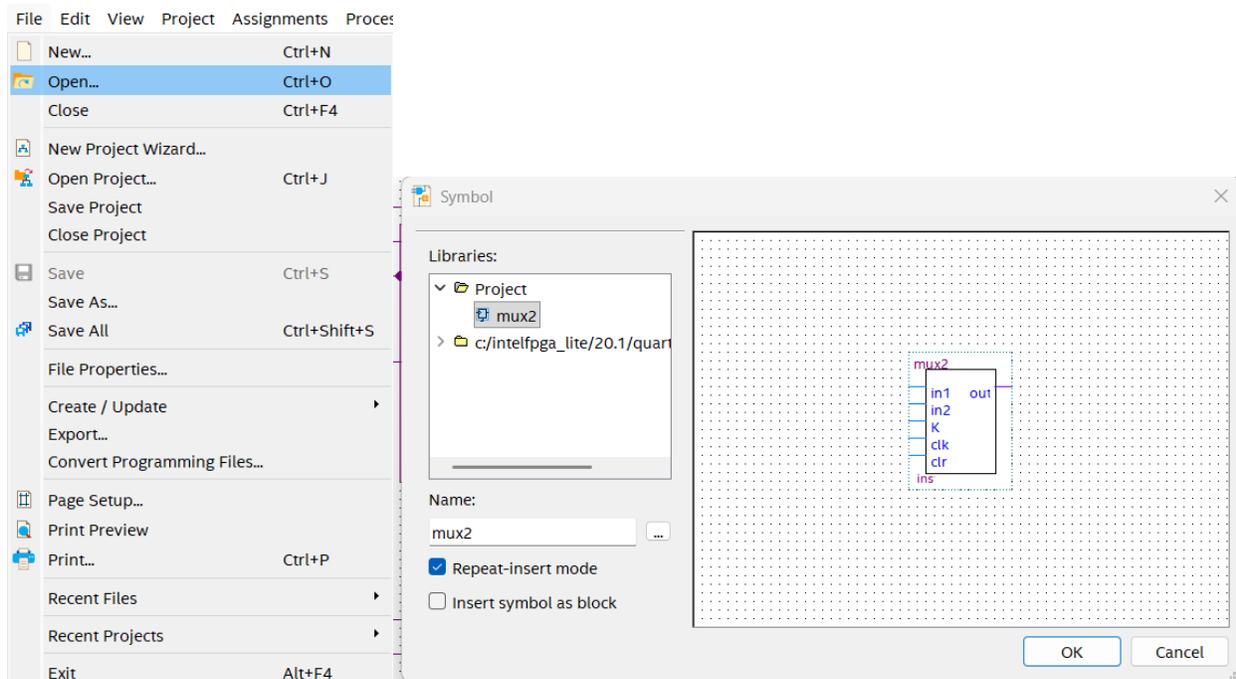
K1	K0	P3	P2	P1	P0	Y3	Y2	Y1	Y0	Operation
0	0	A3	A2	A1	A0	A3	A2	A1	A0	No shift
0	1									
1	0									
1	1									



Adding a File to Your Project

Download the mux2.bdf and mux2.bsf files from Brightspace and add them to the project folder.

With the Quartus project open select file>open and select the mux2.bdf, make sure “add file to project” is checked. Now in the symbol menu, under project, you can select the mux2.bsf.



The provided mux2 consists of 5 inputs, your data inputs in1 and in2, the select K, an asynchronous clear clr, and the clock clk. Connect all sel0 to the K of the first set of mux2 and sel1 to the K inputs of the second set of mux2. Connect clear to the clr off all mux2.