perplexity

We will be generating a 32-bit Barrel Shifter with Rotation Control hierarchically in Verilog. Please begin by generating a 8-bit Barrel Shifter defined as follows:

module barrel_shift_8(inputData[7:0], shiftVal[2:0], outputData[7:0])

```
module barrel_shift_8 (
    input [7:0] inputData,
    input [2:0] shiftVal,
    output [7:0] outputData
);
    wire [7:0] stage1, stage2;

    // Stage 1: Shift by 1 bit if shiftVal[0] is set
    assign stage1 = shiftVal[0] ? {inputData[6:0], inputData[7]} : inputData;

    // Stage 2: Shift by 2 bits if shiftVal[1] is set
    assign stage2 = shiftVal[1] ? {stage1[5:0], stage1[7:6]} : stage1;

    // Final Stage: Shift by 4 bits if shiftVal[2] is set
    assign outputData = shiftVal[2] ? {stage2[3:0], stage2[7:4]} : stage2;

endmodule
```