EEE336/339 Problem Sheet 4 – NJP

1. Draw an ASM chart for a Moore type finite state machine which can detect the parity of an incoming serial data stream. For EVEN parity, the number of ones received up to that point is even. For ODD parity, the number of ones received up to that point is odd. The machine has an input **In** which receives the data stream one bit at a time. The output **Out** should be asserted whenever the input bit stream, up to that point, has an odd number of ones.

2. The two's complement of a number can be obtained by copying down the number from the LSB until the first 1 has been written down. All of the remaining bits are then inverted. Draw an ASM chart for a Mealy type machine which can form the two's complement of a binary number in this way.

3. Draw an ASM chart for a Moore type finite state machine that will count the number of times it is necessary to right shift a data word until it contains no more ones. The data word should be read from an input port named **Iport** and the result should be written to an output port named **Oport**. An input signal **Start** indicates when the operation should begin. An output named **Done** should indicate when the operation is complete.