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This assignment is due on 31 Oct 2020

Please remember to write your name and student number.

You must complete the following assignment and submit a PDF of relevant questions. Handwritten submissions and proprietary formats (e.g. Pages or MS Word) will not be accepted. You will also need to upload LogicWork circuit design file. Then upload a single ZIP file to Moodle.

Submission File structure:

```
submission.zip
  - circuit1-1.cct
  - circuit1-2.cct
  - circuit1-3.cct
  - circuit1-4.cct
  - circuit1-5.cct
  - circuit2-1.cct
  - circuit2-2.cct
  - circuit2-3.cct
  - circuit2-4.cct
  - circuit3.cct
  - lib.clt
```

The circuit files are 2pt each.

Lab 2

1. Save the library and circuit files we created in class containing the following designs in the final ZIP file:
 1. 2-to-4 Decoder (`circuit1-1.cct`);
 2. 3-to-8 Decoder implemented using the 2-to-4 Decoder (`circuit1-2.cct`);
 3. 8-to-3 priority encoder with validity bit (`circuit1-3.cct`);
 4. 4 channel 1bit Multiplexer implemented using the 2-to-4 Decoder (`circuit1-4.cct`);
 5. 4 channel 4bit Multiplexer implemented using the 4 channel 1bit Multiplexers (`circuit1-5.cct`);
 6. Include the above designs in your library file (`lib.clt`), I must be able to use these components in your library file, or 50% of the points will be lost.
2. Save the library and circuit files we created in class containing the following designs in the final ZIP file:
 1. 1-bit binary adder (`circuit2-1.cct`);
 2. 4-bit binary adder (`circuit2-2.cct`);
 3. 4-bit binary adder-subtractor (`circuit2-3.cct`);
 4. 4-bit binary plus 1 incremter (`circuit2-4.cct`);

5. Include the above designs in your library file (`lib.clt`), I must be able to use these components in your library file, or 50% of the points will be lost.
3. Implement the following Boolean function with an 8-to-1 (or 16-to-1) multiplexer and a single inverter with variable D as its input:

$$F(A, B, C, D) = \Sigma m(2,4,6,9,10,11,15)$$

Implement the digital circuit in LogicWorks. Use the 8-to-1 multiplexer we implemented in class (from your own library). Save the file as `circuit3.cct`.