Assembly Programming

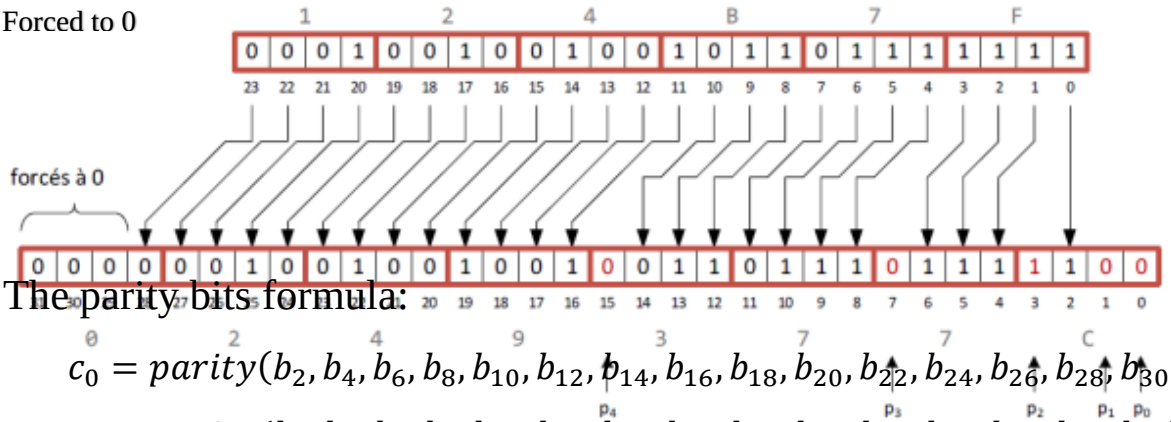
In RISC5

Hamming Code

Document Helper

In this document, you will find some illustrations of the bit maps used in the Hamming Code Project:

THE mapping Function and Parity bits:



The parity bits formula:

$$c_0 = parity(b_2, b_4, b_6, b_8, b_{10}, b_{12}, b_{14}, b_{16}, b_{18}, b_{20}, b_{22}, b_{24}, b_{26}, b_{28}, b_{30})$$

$$c_1 = parity(b_2, b_5, b_6, b_9, b_{10}, b_{13}, b_{14}, b_{17}, b_{18}, b_{21}, b_{22}, b_{25}, b_{26}, b_{29}, b_{30})$$

$$c_2 = parity(b_4, b_5, b_6, b_{11}, b_{12}, b_{13}, b_{14}, b_{19}, b_{20}, b_{21}, b_{22}, b_{27}, b_{28}, b_{29}, b_{30})$$

$$c_3 = parity(b_8, b_9, b_{10}, b_{11}, b_{12}, b_{13}, b_{14}, b_{23}, b_{24}, b_{25}, b_{26}, b_{27}, b_{28}, b_{29}, b_{30})$$

$$c_4 = parity(b_{16}, b_{17}, b_{18}, b_{19}, b_{20}, b_{21}, b_{22}, b_{23}, b_{24}, b_{25}, b_{26}, b_{27}, b_{28}, b_{29}, b_{30})$$

The Error Detecting Bit-Map Formula(C = $c_4c_3c_2c_1c_0$)

$$c_0 = parity(b_0, b_2, b_4, b_6, b_8, b_{10}, b_{12}, b_{14}, b_{16}, b_{18}, b_{20}, b_{22}, b_{24}, b_{26}, b_{28}, b_{30})$$

$$c_1 = parity(b_1, b_2, b_5, b_6, b_9, b_{10}, b_{13}, b_{14}, b_{17}, b_{18}, b_{21}, b_{22}, b_{25}, b_{26}, b_{29}, b_{30})$$

$$c_2 = parity(b_3, b_4, b_5, b_6, b_{11}, b_{12}, b_{13}, b_{14}, b_{19}, b_{20}, b_{21}, b_{22}, b_{27}, b_{28}, b_{29}, b_{30})$$

$$c_3 = parity(b_7, b_8, b_9, b_{10}, b_{11}, b_{12}, b_{13}, b_{14}, b_{23}, b_{24}, b_{25}, b_{26}, b_{27}, b_{28}, b_{29}, b_{30})$$

$$c_4 = parity(b_{15}, b_{16}, b_{17}, b_{18}, b_{19}, b_{20}, b_{21}, b_{22}, b_{23}, b_{24}, b_{25}, b_{26}, b_{27}, b_{28}, b_{29}, b_{30})$$

You can also find the bit format to extract the all the necessary bits in the .data section in the Assembly Code.