Task 4 1-bit error effect:
Before is the original encryption, after is the encryption after bit 10 has been flip-flopped.
OFBmode
Before error:
0101011 0001101 0001111 0001011 1010001
0010010 0101011 1000010 1111000 1100100
0011001 0110010 0100110 1100101 0011010
0001110 0011110 1101000 1011100 1011010
1010011 0000101 1110111 0101011 1001111
1101110 0110100 1011100 1100001 0101010
1010010 0010110 0001001 0000110 1000010
0111110 0100001 1100110 0001000 1110111
1111000 1001111 0001010 0010001 0011101
0011011 0000010 1110111 1010100 1011101
1011100 1110100 0111010 0001101 1101100
1001000 0000010 1110110 1010000 0100011
0110001 0000110 1001010 1110001 0000011
1101110 0100000 0111000 0010100 0111000
1000111 1100010 1010110 0110101 1001000
0100110 1111110 1100101 1101011 0100111
1011010 1111100 1111001 0010000 1110100
0011100 1101010 1011111 1001110 1010010
0001001 0101011 1000011 1001100 0111001
After:
0001111 0001111 0101110 0011001 1110011
0110110 1101010 1100110 1101010 1000000
1011101 1111010 0110010 0100111 0111110
1000110 1010111 1101010 0010100 1111110
0011010 0001100 1100111 0000010 1001011
0100111 0100101 1001110 1100100 0111010
1011011 0000100 0011011 0100110 0010000
0011111 0110011 1000100 0101100 1111101
1011100 1011101 0101110 0110101 1011100
0001111 1000000 1010011 0010000 0010101
1011110 0111100 0011110 1000101 0100101
1011000 0101011 1110010 0011001 0101010
0100011 0000011 1011010 0111000 0010010
1111100 0000000 1101010 0011101 0101010
1100101 1000110 1011100 0010100 1011010
0000010 1011010 0100100 1001111 0110101
1111110 0111000 0110001 0000100 0110110
0111000 0100010 0010110 1001100 0011010
0001101 1100010 1001010 1011100 0010000

ECB mode:
Before:
1101111 1111011 1100011 1111001 0100111
1111011 1100011 1110001 1101010 1111100
1000010 1100001 0100010 0010000 1111110
0011011 0010010 1110010 0000000 1111101
1111011 1110001 0100010 1100000 1111100
0011011 0010001 0111011 1101010 0111110
1111010 0100011 1110000 1110000 1111110
1111011 0001011 1100001 0011001 1111111
0101000 0101011 1100001 0011001 1101110
1101011 0101011 1100011 0011001 0000111
1101010 0100010 0010001 0011001 0010111
1111011 1110010 0001011 1101001 1111110
1111000 1010001 0100010 0011010 1011100
0100010 1100011 1110001 1010000 1111101
1001011 1100011 0111011 1101000 0001101
1011010 0110011 1110001 0101000 0101101
0111000 0101011 1100011 0101000 0101110
1001011 0010010 0000001 1011010 0111101
0001010 1110001 0100010 1111001 0001110
After:
1101110 1111011 1100011 1111001 0100111
1111011 1100011 1110001 1101010 1111100
1000010 1100001 0100010 0010000 1111110
0011011 0010010 1110010 0000000 1111101
1111011 1110001 0100010 1100000 1111100
0011011 0010001 0111011 1101010 0111110
1111010 0100011 1110000 1110000 1111110
1111011 0001011 1100001 0011001 1111111
0101000 0101011 1100001 0011001 1101110
1101011 0101011 1100011 0011001 0000111
1101010 0100010 0010001 0011001 0010111
1111011 1110010 0001011 1101001 1111110
1111000 1010001 0100010 0011010 1011100
0100010 1100011 1110001 1010000 1111101
1001011 1100011 0111011 1101000 0001101
1011010 0110011 1110001 0101000 0101101
0111000 0101011 1100011 0101000 0101110
1001011 0010010 0000001 1011010 0111101
0001010 1110001 0100010 1111001 0001110
Here only one bit was changed. It was the seventh bit, even though I changed the third bit.

CTRmode

Before:

0101011 0001101 0001111 0001001 1010011
0011010 1001100 0011110 0010100 0001010
1100010 1011001 0000001 1000100 0011001
0111101 1000100 0000000 1000100 0000100
1001011 1011001 0000110 1000100 0001010
1011101 1011000 1001110 0010000 0011100
1100110 1001100 0010111 1000100 0011010
1111100 0001101 0011001 0001100 0010010
0010110 0001101 0011001 0001101 0011110
0011110 0001101 0001001 0001011 1010010
0100110 1000010 0011001 0001010 1010010
0111011 1000011 1001110 0001100 0011011
1010001 1011001 0000001 0010110 0001011
0010010 1001100 0011101 1000100 0000110
1101010 1001000 1001110 0000011 0000000
1110111 1001100 0011010 0000001 0000001
0010110 0001101 0001010 0000001 0011100
0011101 1000011 0011101 0010000 0000011
0100011 1011001 0000111 0001011 0011111

After:

0101011 0000101 0001111 0001001 1010011
0011010 1001100 0011110 0010100 0001010
1100010 1011001 0000001 1000100 0011001
0111101 1000100 0000000 1000100 0000100
1001011 1011001 0000110 1000100 0001010
1011101 1011000 1001110 0010000 0011100
1100110 1001100 0010111 1000100 0011010
1111100 0001101 0011001 0001100 0010010
0010110 0001101 0011001 0001101 0011110
0011110 0001101 0001001 0001011 1010010
0100110 1000010 0011001 0001010 1010010
0111011 1000011 1001110 0001100 0011011
1010001 1011001 0000001 0010110 0001011
0010010 1001100 0011101 1000100 0000110
1101010 1001000 1001110 0000011 0000000
1110111 1001100 0011010 0000001 0000001
0010110 0001101 0001010 0000001 0011100
0011101 1000011 0011101 0010000 0000011
0100011 1011001 0000111 0001011 0011111

Here the first block has been changed. It printed a plus sign as the first character, which the original did not do.

CBCmode:

Before:

1101011 0111001 1100010 1111011 0100101
0100110 1010100 1101101 1000101 1001000
1000110 0001011 1101111 1001000 0100111
1100011 1110011 1001111 1111001 1111001
1100111 1001111 0011011 0011111 1100011
0100111 1101000 1001000 1011001 1000010
1011110 1011110 1111001 1111011 1100110
0010000 1100000 0001110 0000110 1000011
0011010 0100111 1100000 1111001 0000110
0001000 0001111 0011111 0010110 0010111
0011011 0100011 1100010 1101011 1110101
0101000 1000110 0110111 1000100 1000000
1111101 1011001 1000100 1100010 0010100
1101101 0111000 1101001 0011100 1011111
0110110 0110100 0110110 1111011 1000110
0111100 1010101 0110111 1000111 0010101
1101111 1100001 0110101 1010000 1011100
0000110 1101110 0010111 0000000 0110110
1101010 0011100 1000000 0001001 0001000

After:

1101011 0111000 1100010 1111011 0100101
0100110 1010100 1111101 1000101 1001000
1000110 0001011 1101101 1001000 0100111
1100011 1110011 1001111 1011001 1111001
1100111 1001111 0011011 0011011 1100011
0100111 1101000 1001000 1011001 0000010
1011110 1011110 1111001 1111011 1101110
0010000 1100000 0001110 0000110 1000010
0001010 0100111 1100000 1111001 0000110
0001010 0001111 0011111 0010110 0010111
0011011 0000011 1100010 1101011 1110101
0101000 1000010 0110111 1000100 1000000
1111101 1011001 0000100 1100010 0010100
1101101 0111000 1100001 0011100 1011111
0110110 0110100 0110111 1111011 1000110
0111100 1010101 0110111 1010111 0010101
1101111 1100001 0110101 1010010 1011100
0000110 1101110 0010111 0000000 0010110
1101010 0011100 1000000 0001001 0001100

Here we can see that many blocks have been changed. Red has been changed green is the same.