

Black Box:

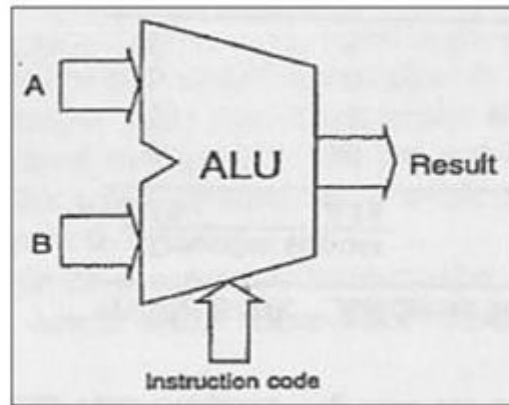


Figure 1

Gate Level:

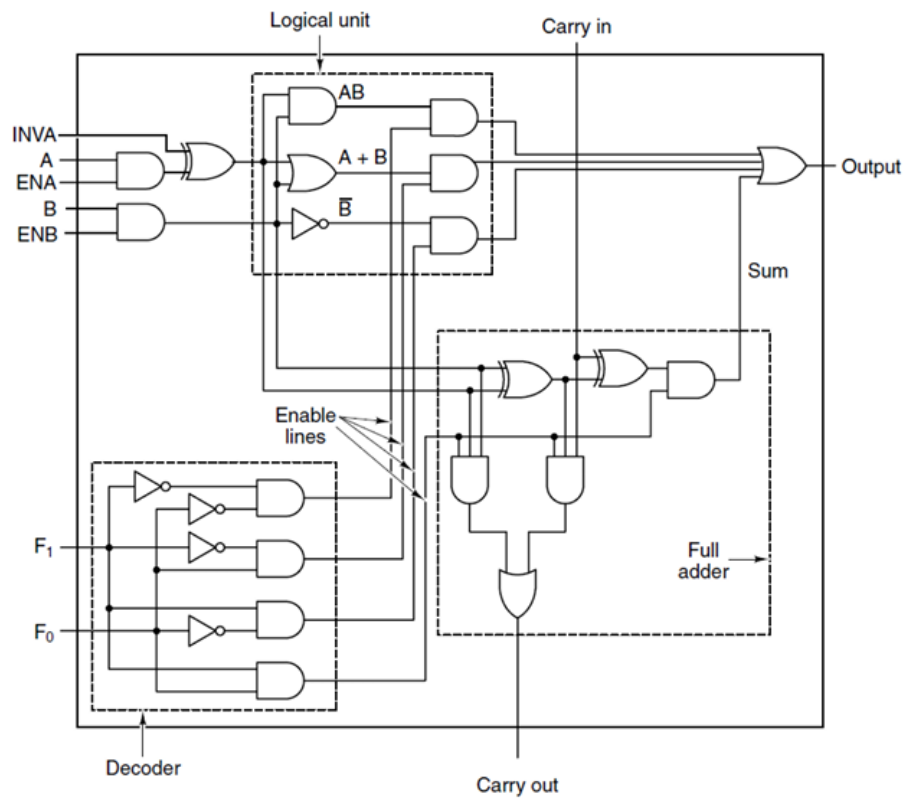


Figure 2

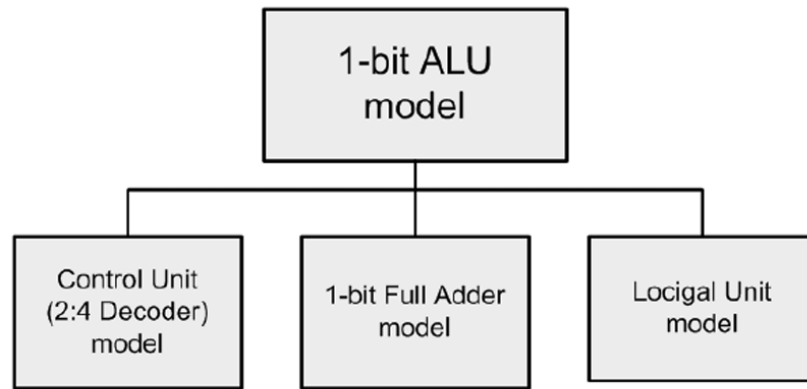


Figure 3

Operational Truth Table:

| F₁ | F₀ | EN_A | EN_B | INV_A | C_{IN} | Output |
|----------------------|----------------------|-----------------------|-----------------------|------------------------|-----------------------|----------------|
| 0 | 1 | 1 | 0 | 0 | 0 | A |
| 0 | 1 | 0 | 1 | 0 | 0 | B |
| 0 | 1 | 1 | 0 | 1 | 0 | A' |
| 1 | 0 | 0 | 1 | 0 | 0 | B' |
| 1 | 1 | 1 | 1 | 0 | 0 | A+B |
| 1 | 1 | 1 | 1 | 0 | 1 | A+B+1 |
| 1 | 1 | 1 | 0 | 0 | 1 | A+1 |
| 1 | 1 | 0 | 1 | 0 | 1 | B+1 |
| 1 | 1 | 1 | 1 | 1 | 1 | B-A |
| 1 | 1 | 0 | 1 | 1 | 0 | B-1 |
| 1 | 1 | 1 | 0 | 1 | 1 | -A |
| 0 | 0 | 1 | 1 | 0 | 0 | A AND B |
| 0 | 1 | 1 | 1 | 0 | 0 | A OR B |
| 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 | 1 | 0 | -1 |