FA:

```vhdl
ENTITY FA IS PORT (
    a: IN STD_LOGIC_VECTOR(1 DOWNTO 0);
    b: IN STD_LOGIC_VECTOR(1 DOWNTO 0);
    cin: IN STD_LOGIC;
    r: OUT STD_LOGIC_VECTOR(1 DOWNTO 0);
    cout: OUT STD_LOGIC
);
END FA;

ARCHITECTURE arch OF FA IS

BEGIN

r(1) <= (( a(1) and not a(0) and b(1) and  not cin) or
    ( a(1) and b(1) and b(0) and cin) or
    (a(1) and a(0) and b(1) and not b(0)) or
    (not a(1) and not a(0) and not b(1) and not cin) or
    (not a(1) and not b(1) and b(0) and cin) or
    (not a(1) and a(0) and not b(1) and not b(0)) or
    (not a(1) and a(0) and b(1) and b(0) and not cin) or
    (not a(1) and not a(0) and b(1) and not b(0) and cin) or
    (a(1) and a(0) and not b(1) and b(0) and not cin) or
    (a(1) and not a(0) and not b(1) and not b(0) and cin)) after 10 ns;

r(0) <= ((a(0) and not b(0) and not cin) or
    (a(0) and b(0) and cin) or
    (not a(0) and b(0) and not cin) or
    (not a(0) and not b(0) and cin)) after 10 ns;

cout <= ((not a(1) and not b(1) and not b(0) and cin) or
    (not a(1) and not a(0) and cin ) or
    (a(0) and b(1) and b(0)) or
    (not a(1) and b(1) and b(0)) or
    (a(1) and a(0) and cin) or
    (not a(1) and not a(0) and not b(1) and not b(0)) or
    (a(1) and a(0) and not b(1)) or
    (b(1) and b(0) and cin)) after 10 ns;

END arch;
```

B1-Komplement

```
library IEEE;
use IEEE.STD_LOGIC_1164.ALL;

ENTITY b_1komplement IS PORT (
    b: IN STD_LOGIC_VECTOR(1 DOWNTO 0);
    y: OUT STD_LOGIC_VECTOR(1 DOWNTO 0)
);
END b_1komplement;

ARCHITECTURE arch OF b_1komplement IS
BEGIN

y(1) <= (b(1)) after 10 ns;
y(0) <= (not b(0)) after 10 ns;

END arch;
```

DMUX:
```
library IEEE;
use IEEE.STD_LOGIC_1164.ALL;
ENTITY dmux IS PORT (
    x: IN STD_LOGIC_VECTOR(1 DOWNTO 0);
    y: IN STD_LOGIC_VECTOR(1 DOWNTO 0);
    s: IN STD_LOGIC;
    Z: OUT STD_LOGIC_VECTOR(1 DOWNTO 0)
);
END dmux;

ARCHITECTURE arch OF dmux IS

BEGIN

z(1) <= ((x(1) and not s) or (y(1) and s)) after 10 ns;
z(0) <= ((x(0) and not s) or (y(0) and s)) after 10 ns;

END arch;
```

Primitiv:
```
library IEEE;
use IEEE.STD_LOGIC_1164.ALL;

ENTITY primitiv IS PORT (
    a: IN STD_LOGIC_VECTOR(1 DOWNTO 0);
    b: IN STD_LOGIC_VECTOR(1 DOWNTO 0);
    cin: IN STD_LOGIC;
    oper: IN STD_LOGIC;
    r: OUT STD_LOGIC_VECTOR(1 DOWNTO 0);
    cout: OUT STD_LOGIC
);
END primitiv;

ARCHITECTURE arch OF primitiv IS
    SIGNAL i,j: STD_LOGIC_VECTOR(1 DOWNTO 0);
BEGIN
KOMPLEMENT: ENTITY WORK.b_1komplement PORT MAP(b(1 DOWNTO 0), i(1 DOWNTO 0));
MUX: ENTITY WORK.dmux PORT MAP(b(1 DOWNTO 0),i(1 DOWNTO 0), oper, j(1 DOWNTO 0));
ADDER: ENTITY WORK.FA PORT MAP(a(1 DOWNTO 0), j(1 DOWNTO 0), cin, r(1 DOWNTO 0), cout);
END arch;
```

Zbrajalo:
```
library IEEE;
use IEEE.STD_LOGIC_1164.ALL;

ENTITY zbrajalo IS PORT (
    a: IN STD_LOGIC_VECTOR(7 DOWNTO 0);
    b: IN STD_LOGIC_VECTOR(7 DOWNTO 0);
    oper: IN STD_LOGIC;
    r: OUT STD_LOGIC_VECTOR(7 DOWNTO 0);
    cout: OUT STD_LOGIC
);
END zbrajalo;

ARCHITECTURE arch OF zbrajalo IS
    SIGNAL i: STD_LOGIC_VECTOR(2 DOWNTO 0);
BEGIN
ADD0: ENTITY WORK.primitiv PORT MAP(a(1 DOWNTO 0), b(1 DOWNTO 0), oper, oper, r(1 DOWNTO 0), i(0));
ADD1: ENTITY WORK.primitiv PORT MAP(a(3 DOWNTO 2), b(3 DOWNTO 2), i(0), oper, r(3 DOWNTO 2), i(1));
ADD2: ENTITY WORK.primitiv PORT MAP(a(5 DOWNTO 4), b(5 DOWNTO 4), i(1), oper, r(5 DOWNTO 4), i(2));
ADD3: ENTITY WORK.primitiv PORT MAP(a(7 DOWNTO 6), b(7 DOWNTO 6), i(2), oper, r(7 DOWNTO 6), cout);
END arch;
```