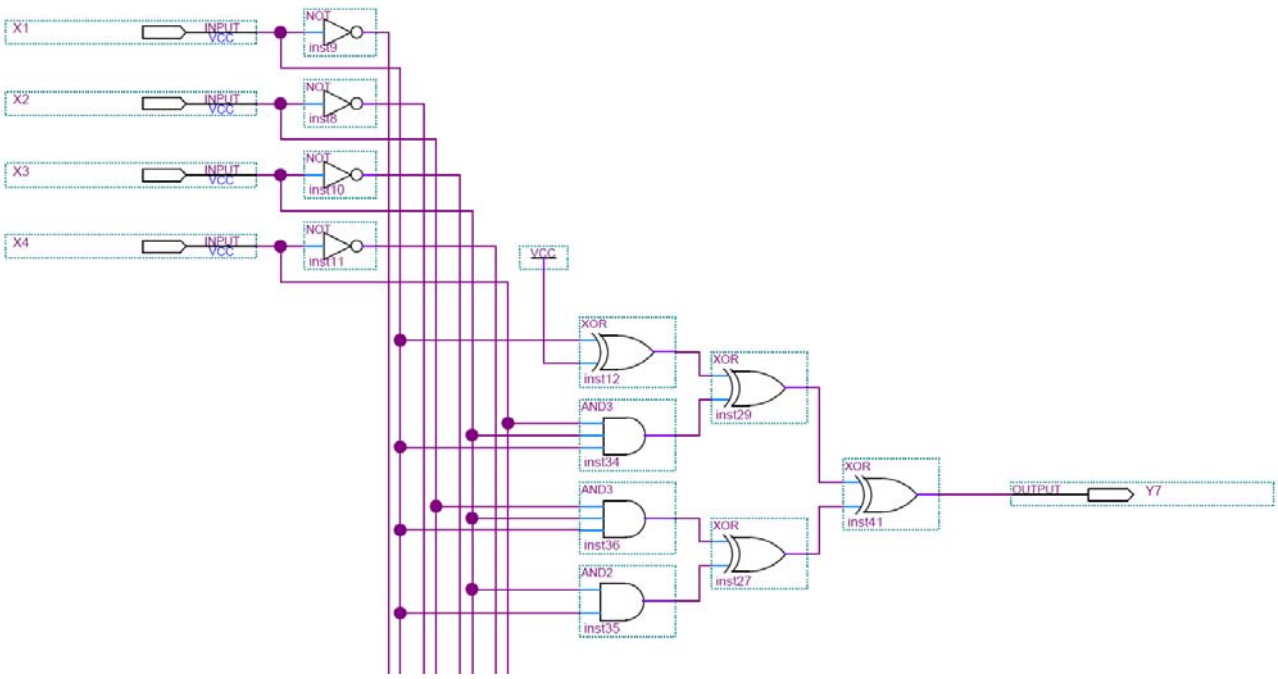
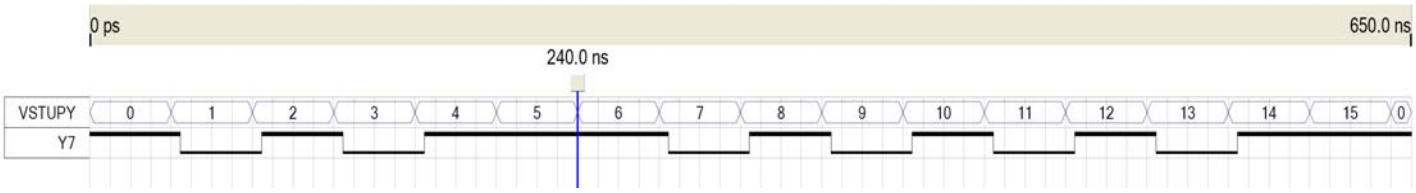
$$Y = \overline{D}.\overline{C}.\overline{B}.\overline{A} \oplus \overline{D}.\overline{C}.B.\overline{A} \oplus \overline{D}.C.\overline{B}.\overline{A} \oplus \overline{D}.C.B.\overline{A} \oplus D.\overline{C}.\overline{B}.\overline{A} \oplus D.\overline{C}.B.\overline{A} \oplus$$
$$D.C.\overline{B}.\overline{A} \oplus D.C.B.\overline{A} \oplus \overline{D}.C.\overline{B}.A \oplus D.C.B.A =$$

$$\overline{D}.\overline{C}.\overline{A}.(\overline{B}+B) \oplus \overline{D}.C.\overline{A}.(\overline{B}+B) \oplus D.\overline{C}.\overline{A}.(\overline{B}+B) \oplus D.C.\overline{A}.(\overline{B}+B) \oplus$$
$$\overline{D}.C.\overline{B}.A \oplus D.C.B.A =$$

$$\overline{D}.\overline{C}.\overline{A} \oplus \overline{D}.C.\overline{A} \oplus D.\overline{C}.\overline{A} \oplus D.C.\overline{A} \oplus \overline{D}.C.\overline{B}.A \oplus D.C.B.A =$$

$$\overline{D}.\overline{A} \oplus D.\overline{A} \oplus \overline{D}.C.\overline{B}.A \oplus D.C.B.A = \overline{A} \oplus \overline{D}.C.\overline{B}.A \oplus D.C.B.A =$$

$$(A \oplus 1) \oplus (D \oplus 1).C.(B \oplus 1).A \oplus D.C.B.A =$$
$$(A \oplus 1) \oplus (D.B \oplus D \oplus B \oplus 1).C.A \oplus D.C.B.A =$$
$$A \oplus 1 \oplus D.B.C.A \oplus D.C.A \oplus B.C.A \oplus .C.A \oplus D.C.B.A =$$
$$A \oplus 1 \oplus D.C.A \oplus B.C.A \oplus C.A$$