```
— MODULE model -
EXTENDS Integers, Naturals, Sequences, TLC, TLAPS
Constant N
Assume NNAT \stackrel{\triangle}{=} N \in Nat
CONSTANTS MEM_LENGTH, MEM_WIDTH
Variable MEM
MEMORY \triangleq [0..(MEM\_LENGTH) \rightarrow [0..(MEM\_WIDTH) \rightarrow \{TRUE, FALSE\}]]
 Init \stackrel{\triangle}{=} MEM = [0.. (MEM\_LENGTH) \mapsto [0.. (MEM\_WIDTH) \mapsto FALSE]]
 TypeInvariant \stackrel{\Delta}{=} MEM \in MEMORY
BVN \stackrel{\triangle}{=} [0 ... N \rightarrow \{\text{TRUE, FALSE}\}]
BV32 \stackrel{\triangle}{=} [0..31 \rightarrow \{\text{TRUE}, \text{FALSE}\}]
BV64 \stackrel{\triangle}{=} [0..63 \rightarrow \{\text{TRUE}, \text{FALSE}\}]
ANDN \stackrel{\triangle}{=} [f \in BVN \mapsto [q \in BVN \mapsto [i \in 0 ... N \mapsto f[i] \land q[i]]]]
AND32 \triangleq [f \in BV32 \mapsto [g \in BV32 \mapsto [i \in 0..31 \mapsto f[i] \land g[i]]]
AND64 \stackrel{\triangle}{=} [f \in BV64 \mapsto [g \in BV64 \mapsto [i \in 0 ... 63 \mapsto f[i] \land g[i]]]]
ORN \stackrel{\Delta}{=} [f \in BVN \mapsto [g \in BVN \mapsto [i \in 0 ... N \mapsto f[i] \lor g[i]]]]
OR32 \triangleq [f \in BV32 \mapsto [g \in BV32 \mapsto [i \in 0..31 \mapsto f[i] \lor g[i]]]]
OR64 \triangleq [f \in BV64 \mapsto [g \in BV64 \mapsto [i \in 0...63 \mapsto f[i] \lor g[i]]]]
EXPANDN \stackrel{\triangle}{=} [b \in \{\text{TRUE}, \text{FALSE}\} \mapsto [i \in 0... N \mapsto b]]
EXPAND64 \stackrel{\triangle}{=} [b \in \{TRUE, FALSE\} \mapsto [i \in 0...63 \mapsto b]]
XORN \stackrel{\triangle}{=} [f \in BVN \mapsto [g \in BVN \mapsto [i \in 0...N \mapsto ((f[i] \land \neg g[i]) \lor (\neg f[i] \land g[i]))]]]
XOR64 \stackrel{\triangle}{=} [f \in BV64 \mapsto [g \in BV64 \mapsto [i \in 0...63 \mapsto ((f[i] \land \neg g[i]) \lor (\neg f[i] \land g[i]))]]]
CMP32 \triangleq [f \in BVN \mapsto [q \in BVN \mapsto
                                                          \neg XORN[f][g][0] \land \neg XORN[f][g][1] \land \neg XORN[f][g][2] \land
                                                         \neg XORN[f][g][3] \land \neg XORN[f][g][4] \land \neg XORN[f][g][5] \land
                                                         \neg XORN[f][g][6] \land \neg XORN[f][g][7] \land \neg XORN[f][g][8] \land
                                                         \neg XORN[f][g][9] \land \neg XORN[f][g][10] \land \neg XORN[f][g][11] \land
                                                         \neg XORN[f][g][12] \land \neg XORN[f][g][13] \land \neg XORN[f][g][14] \land
                                                         \neg XORN[f][g][15] \land \neg XORN[f][g][16] \land \neg XORN[f][g][17] \land
                                                          \neg XORN[f][g][18] \land \neg XORN[f][g][19] \land \neg XORN[f][g][20] \land
```

 $\neg XORN[f][g][21] \land \neg XORN[f][g][22] \land \neg XORN[f][g][23] \land$

```
\neg XORN[f][g][24] \land \neg XORN[f][g][25] \land \neg XORN[f][g][26] \land
                                                                                                                                                                            \neg XORN[f][g][27] \land \neg XORN[f][g][28] \land \neg XORN[f][g][29] \land
                                                                                                                                                                            \neg XORN[f][g][30] \land \neg XORN[f][g][31]]
   CMP64 \stackrel{\Delta}{=} [f \in BVN \mapsto [q \in BVN \mapsto
                                                                                                                                                                            \neg XORN[f][g][0] \land \neg XORN[f][g][1] \land \neg XORN[f][g][2] \land
                                                                                                                                                                            \neg XORN[f][g][3] \land \neg XORN[f][g][4] \land \neg XORN[f][g][5] \land
                                                                                                                                                                            \neg XORN[f][g][6] \land \neg XORN[f][g][7] \land \neg XORN[f][g][8] \land
                                                                                                                                                                            \neg XORN[f][g][9] \land \neg XORN[f][g][10] \land \neg XORN[f][g][11] \land
                                                                                                                                                                            \neg XORN[f][g][12] \land \neg XORN[f][g][13] \land \neg XORN[f][g][14] \land
                                                                                                                                                                            \neg XORN[f][g][15] \land \neg XORN[f][g][16] \land \neg XORN[f][g][17] \land
                                                                                                                                                                            \neg XORN[f][g][18] \land \neg XORN[f][g][19] \land \neg XORN[f][g][20] \land
                                                                                                                                                                            \neg XORN[f][g][21] \land \neg XORN[f][g][22] \land \neg XORN[f][g][23] \land
                                                                                                                                                                            \neg XORN[f][g][24] \land \neg XORN[f][g][25] \land \neg XORN[f][g][26] \land
                                                                                                                                                                            \neg XORN[f][g][27] \land \neg XORN[f][g][28] \land \neg XORN[f][g][29] \land
                                                                                                                                                                            \neg XORN[f][g][30] \land \neg XORN[f][g][31] \land
                                                                                                                                                                            \neg XORN[f][g][32] \land \neg XORN[f][g][33] \land \neg XORN[f][g][34] \land
                                                                                                                                                                            \neg XORN[f][g][35] \land \neg XORN[f][g][36] \land \neg XORN[f][g][37] \land
                                                                                                                                                                            \neg XORN[f][g][38] \land \neg XORN[f][g][39] \land \neg XORN[f][g][40] \land
                                                                                                                                                                            \neg XORN[f][g][41] \land \neg XORN[f][g][42] \land \neg XORN[f][g][43] \land
                                                                                                                                                                            \neg XORN[f][g][44] \land \neg XORN[f][g][45] \land \neg XORN[f][g][46] \land \\
                                                                                                                                                                            \neg XORN[f][g][47] \land \neg XORN[f][g][48] \land \neg XORN[f][g][49] \land
                                                                                                                                                                            \neg XORN[f][g][50] \land \neg XORN[f][g][51] \land \neg XORN[f][g][52] \land
                                                                                                                                                                            \neg XORN[f][g][53] \land \neg XORN[f][g][54] \land \neg XORN[f][g][55] \land
                                                                                                                                                                            \neg XORN[f][g][56] \land \neg XORN[f][g][57] \land \neg XORN[f][g][58] \land
                                                                                                                                                                            \neg XORN[f][g][59] \land \neg XORN[f][g][60] \land \neg XORN[f][g][61] \land
                                                                                                                                                                            \neg XORN[f][g][62] \land \neg XORN[f][g][63]]
CMP\_EQ\_LT\_GT \triangleq [b0 \in \{\text{TRUE}, \text{FALSE}\} \mapsto [b1 \in \{\text{TRUE}, \text{FALSE}\} \mapsto
              [eq \in \{\text{TRUE}, \text{FALSE}\} \mapsto [lt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt \in \{\text{TRUE}, \text{FALSE}\}] \mapsto [gt \in \{\text{TRUE}, \text
                          [i \in 0 \dots 2 \mapsto
                                      ((i = 0) \land ((b0 \land b1) \lor (\neg b0 \land \neg b1)) \land eq) \lor
                                      ((i = 1) \land ((\neg b0 \land b1 \land eq) \lor lt)) \lor
                                      ((i=2) \land ((b0 \land \neg b1 \land eq) \lor gt))
                                                                                                                                                                                                                                       ]]]]]]]
CMP\_EQ\_LT\_GT\_1 \stackrel{\triangle}{=} [f \in BVN \mapsto [g \in BVN \mapsto [i \in 0 ... 63 \mapsto
              [eq \in \{\text{TRUE}, \text{FALSE}\} \mapsto [lt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt \in \{\text{TRUE}, \text{FALSE}\} \mapsto 
                            CMP\_EQ\_LT\_GT[f[i]][g[i]][eq][lt][gt]
                                                                                                                                                                                                                 ]]]]]]]
CMP\_EQ\_LT\_GT\_2 \triangleq [f \in BVN \mapsto [g \in BVN \mapsto [i \in \{x \in 0 ... 62 : x\%2 = 0\} \mapsto a
              [eq \in \{\text{TRUE}, \text{FALSE}\} \mapsto [lt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt]]
                                                                                                                                                                                                                                                                 \in \{\text{TRUE}, \text{FALSE}\} \mapsto
                            CMP\_EQ\_LT\_GT\_1[f][g][i]
                                             [CMP\_EQ\_LT\_GT\_1[f][g][i+1][eq][lt][gt][0]]
                                            [CMP\_EQ\_LT\_GT\_1[f][g][i+1][eq][lt][gt][1]]
```

```
[CMP\_EQ\_LT\_GT\_1[f][g][i+1][eq][lt][gt][2]]
   CMP\_EQ\_LT\_GT\_3 \triangleq [f \in BVN \mapsto [g \in BVN \mapsto [i \in 0..61 \mapsto
                                         [eq \in \{\text{TRUE}, \text{FALSE}\} \mapsto [lt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [qt \in \{\text{TRUE}, \text{FALSE}\} \mapsto 
                                                                              CMP\_EQ\_LT\_GT\_1[f][q][i]
                                                                                                                            [CMP\_EQ\_LT\_GT\_2[f][g][i+1][eq][lt][gt][0]]
                                                                                                                              [CMP\_EQ\_LT\_GT\_2[f][g][i+1][eq][lt][gt][1]]
                                                                                                                          [CMP\_EQ\_LT\_GT\_2[f][g][i+1][eq][lt][gt][2]]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ]]]]]]]
   CMP\_EQ\_LT\_GT\_4 \triangleq [f \in BVN \mapsto [q \in BVN \mapsto [i \in \{x \in 0...60 : x\%4 = 0\}] \mapsto
                                         [eq \in \{\text{TRUE}, \text{FALSE}\} \mapsto [lt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt]\}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \in \{\text{TRUE}, \text{FALSE}\} \mapsto
                                                                              CMP\_EQ\_LT\_GT\_2[f][g][i]
                                                                                                                          [CMP\_EQ\_LT\_GT\_2[f][g][i+2][eq][lt][gt][0]]
                                                                                                                              [CMP\_EQ\_LT\_GT\_2[f][g][i+2][eq][lt][gt][1]]
                                                                                                                          [CMP\_EQ\_LT\_GT\_2[f][g][i+2][eq][lt][gt][2]]
   CMP\_EQ\_LT\_GT\_8 \triangleq [f \in BVN \mapsto [g \in BVN \mapsto [i \in \{0, 8, 16, 24, 32, 40, 48, 56\} \mapsto (i \in \{0, 8, 16, 24, 32, 40, 48, 56\} \mapsto (i \in \{0, 8, 16, 24, 32, 40, 48, 56\})
                                           [eq \in \{\text{TRUE}, \text{FALSE}\} \mapsto [lt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt \in \{\text{TRUE}, \text{FALSE}\} \mapsto 
                                                                              CMP\_EQ\_LT\_GT\_4[f][g][i]
                                                                                                                        [CMP\_EQ\_LT\_GT\_4[f][g][i+4][eq][lt][gt][0]]
                                                                                                                          [CMP\_EQ\_LT\_GT\_4[f][g][i+4][eq][lt][gt][1]]
                                                                                                                          [CMP\_EQ\_LT\_GT\_4[f][g][i+4][eq][lt][gt][2]]
   CMP\_EQ\_LT\_GT\_16 \stackrel{\triangle}{=} [f \in BVN \mapsto [g \in BVN \mapsto [i \in \{0, 16, 32, 48\} \mapsto (i \in \{0, 16, 32, 48\}
                                         [eq \in \{\text{TRUE}, \text{FALSE}\} \mapsto [lt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt \in \{\text{TRUE}, \text{FALSE}\} \mapsto 
                                                                              CMP\_EQ\_LT\_GT\_8[f][g][i]
                                                                                                                          [CMP\_EQ\_LT\_GT\_8[f][g][i+8][eq][lt][gt][0]]
                                                                                                                            [CMP\_EQ\_LT\_GT\_8[f][g][i+8][eq][lt][gt][1]]
                                                                                                                        [CMP\_EQ\_LT\_GT\_8[f][g][i+8][eq][lt][gt][2]]
   CMP\_EQ\_LT\_GT\_32 \stackrel{\triangle}{=} [f \in BVN \mapsto [g \in BVN \mapsto [i \in \{0, 32\} \mapsto (i 
                                         [eq \in \{\text{TRUE}, \text{FALSE}\} \mapsto [lt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt \in \{\text{TRUE}, \text{FALSE}\} \mapsto [gt \in \{\text{TRUE}, \text{FALSE}\}] \mapsto [gt \in \{\text{TRUE}, \text
                                                                              CMP\_EQ\_LT\_GT\_16[f][g][i]
                                                                                                                            [CMP\_EQ\_LT\_GT\_16[f][g][i+16][eq][lt][gt][0]]
                                                                                                                            [CMP\_EQ\_LT\_GT\_16[f][g][i+16][eq][lt][gt][1]]
                                                                                                                          [CMP\_EQ\_LT\_GT\_16[f][g][i+16][eq][lt][gt][2]]
   b0 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto \text{FALSE}]
b1 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0)]
 b2 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1)]
b3 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1)]
 b4 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2)]
 b5 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2)]
   b6 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2)]
```

```
b7 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2)]
b8 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3)]
b9 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3)]
b10 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3)]
b11 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3)]
b12 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3)]
b13 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3)]
b14 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3)]
b15 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3)]
b16 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4)]
b17 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4)]
b18 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4)]
b19 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4)]
b20 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4)]
b21 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4)]
b22 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4)]
b23 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4)]
b24 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4)]
b25 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4)]
b26 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4)]
b27 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4)]
b28 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4)]
b29 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4)]
b30 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4)]
b31 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4)]
b32 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 5)]
b33 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 5)]
b34 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 5)]
b35 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 5)]
b36 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i=2) \lor (i=5)]
b37 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 5)]
b38 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 5)]
b39 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 5)]
b40 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 5)]
b41 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 5)]
b42 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 5)]
b43 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 5)]
b44 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 5)]
b45 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 5)]
b46 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5)]
b47 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5)]
b48 \triangleq [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 5)]
b49 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 5)]
b50 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 5)]
b51 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 5)]
```

```
b52 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 5)]
b53 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 5)]
b54 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5)]
b55 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5)]
b56 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 5)]
b57 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 5)]
b58 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5)]
b59 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5)]
b60 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5)]
b61 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5)]
b62 \triangleq [i \in 0..63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5)]
b63 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5)]
b64 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 6)]
b65 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 6)]
b66 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 6)]
b67 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 6)]
b68 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 6)]
b69 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 6)]
b70 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 6)]
b71 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 6)]
b72 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 6)]
b73 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 6)]
b74 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 6)]
b75 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 6)]
b76 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 6)]
b77 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 6)]
b78 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 6)]
b79 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 6)]
b80 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 6)]
b81 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 6)]
b82 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 6)]
b83 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 6)]
b84 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 6)]
b85 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 6)]
b86 \triangleq [i \in 0...63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 6)]
b87 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 6)]
b88 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 6)]
b89 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 6)]
b90 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 6)]
b91 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 6)]
b92 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6)]
b93 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6)]
b94 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6)]
b95 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6)]
b96 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 5) \lor (i = 6)]
```

```
b97 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 5) \lor (i = 6)]
b98 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 5) \lor (i = 6)]
b99 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 5) \lor (i = 6)]
b100 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 5) \lor (i = 6)]
b101 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 5) \lor (i = 6)]
b102 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 6)]
b103 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 6)]
b104 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 5) \lor (i = 6)]
b105 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 5) \lor (i = 6)]
b106 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 6)]
b107 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 6)]
b108 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6)]
b109 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6)]
b110 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6)]
b111 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6)]
b112 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 5) \lor (i = 6)]
b113 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b114 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b115 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
             [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b117 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b118 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b119 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b120 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b121 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b122 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b123 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b124 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b125 \ \stackrel{\triangle}{=} \ [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b126 \ \stackrel{\triangle}{=} \ [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b127 \ \stackrel{\triangle}{=} \ [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6)]
b128 \stackrel{\triangle}{=}
             [i \in 0 \dots 63 \mapsto (i=7)]
b129 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 7)]
b130 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 7)]
b131 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 7)]
b132 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i=2) \lor (i=7)]
b133 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 7)]
b134 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 7)]
b135 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 7)]
b136 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 7)]
b137 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 7)]
b138 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 7)]
b139 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 7)]
b140 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 7)]
b141 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 7)]
```

```
b142 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 7)]
b143 \ \stackrel{\triangle}{=} \ [i \in 0 ... 63 \mapsto (i=0) \lor (i=1) \lor (i=2) \lor (i=3) \lor (i=7)]
b144 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 7)]
b145 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 7)]
b146 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 7)]
b147 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 7)]
b148 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 7)]
b149 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 7)]
b150 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 7)]
b151 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 7)]
b152 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 7)]
b153 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 7)]
b154 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 7)]
b155 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 7)]
b156 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 7)]
b157 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 7)]
b158 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 7)]
b159 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 7)]
b160 \triangleq [i \in 0 ... 63 \mapsto (i = 5) \lor (i = 7)]
b161 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 5) \lor (i = 7)]
b162 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 5) \lor (i = 7)]
b163 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 1) \lor (i = 5) \lor (i = 7)]
b164 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 5) \lor (i = 7)]
b165 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 5) \lor (i = 7)]
b166 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 7)]
b167 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 7)]
b168 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 5) \lor (i = 7)]
b169 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 5) \lor (i = 7)]
b170 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 7)]
b171 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 7)]
b172 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 7)]
b173 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 7)]
b174 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 7)]
b175 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 7)]
b176 \triangleq [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 5) \lor (i = 7)]
b177 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b178 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b179 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b180 \triangleq [i \in 0...63 \mapsto (i=2) \lor (i=4) \lor (i=5) \lor (i=7)]
b181 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b182 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b183 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b184 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b185 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b186 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
```

```
b187 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
             [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b189 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b190 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b191 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7)]
b192 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 6) \lor (i = 7)]
b193 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 6) \lor (i = 7)]
b194 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 6) \lor (i = 7)]
b195 \triangleq
             [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 6) \lor (i = 7)]
b196 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 6) \lor (i = 7)]
b197 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 6) \lor (i = 7)]
b198 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 6) \lor (i = 7)]
b199 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 6) \lor (i = 7)]
b200 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 6) \lor (i = 7)]
b201 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 6) \lor (i = 7)]
b202 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 6) \lor (i = 7)]
b203 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 6) \lor (i = 7)]
b204 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 7)]
b205 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 7)]
b206 \triangleq
            [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 7)]
b207 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 7)]
b208 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 6) \lor (i = 7)]
b209 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b210 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b211 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b212 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b213 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b214 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b215 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b216 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b217 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b218 \triangleq
             [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b219 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b220 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b221 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b222 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b223 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7)]
b224 \, \stackrel{\triangle}{=} \, \left[ i \in 0 \ldots 63 \mapsto (i=5) \lor (i=6) \lor (i=7) \right]
b225 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b226 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b227 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b228 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b229 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b230 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b231 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
```

```
b232 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b233 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b234 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b235 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b236 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b237 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b238 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b239 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
             [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b241 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b242 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b243 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b244 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b245 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b246 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b247 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b248 \triangleq [i \in 0..63 \mapsto (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b249 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b250 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
             [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b252 \, \stackrel{\triangle}{=} \, \left[ i \in 0 \, . \, . \, 63 \mapsto (i=2) \vee (i=3) \vee (i=4) \vee (i=5) \vee (i=6) \vee (i=7) \right]
b253 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b254 \stackrel{\triangle}{=} [i \in 0...63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b255 \stackrel{\triangle}{=}
             [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7)]
b256 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 8)]
b257 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 8)]
b258 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 8)]
b259 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 8)]
b260 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 8)]
b261 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 8)]
b262 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 8)]
b263 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 8)]
b264 \stackrel{\triangle}{=} [i \in 0 \dots 63 \mapsto (i=3) \lor (i=8)]
b265 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 8)]
b266 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 8)]
b267 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 8)]
b268 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i=2) \lor (i=3) \lor (i=8)]
b269 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 8)]
b270 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 8)]
b271 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 8)]
b272 \triangleq [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 8)]
b273 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 8)]
b274 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 8)]
b275 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 8)]
b276 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 8)]
```

```
b277 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 8)]
             [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 8)]
b279 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 8)]
b280 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 8)]
b281 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 8)]
b282 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 8)]
b283 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 8)]
b284 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 8)]
             [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 8)]
b286 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 8)]
b287 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 8)]
b288 \triangleq [i \in 0 ... 63 \mapsto (i = 5) \lor (i = 8)]
b289 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 5) \lor (i = 8)]
b290 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 5) \lor (i = 8)]
b291 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 5) \lor (i = 8)]
b292 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 5) \lor (i = 8)]
b293 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 5) \lor (i = 8)]
b294 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 8)]
b295 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 8)]
b296 \triangleq
             [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 5) \lor (i = 8)]
b297 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 5) \lor (i = 8)]
b298 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 8)]
b299 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 8)]
b300 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 8)]
b301 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 8)]
b302 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 8)]
b303 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 8)]
b304 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 5) \lor (i = 8)]
b305 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b306 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b307 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b308 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b309 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b310 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b311 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b312 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b313 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b314 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b315 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b316 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b317 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b318 \triangleq [i \in 0...63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b319 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 8)]
b320 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 6) \lor (i = 8)]
b321 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 6) \lor (i = 8)]
```

```
b322 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 6) \lor (i = 8)]
b323 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 6) \lor (i = 8)]
b324 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 6) \lor (i = 8)]
b325 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 6) \lor (i = 8)]
b326 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 6) \lor (i = 8)]
b327 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 6) \lor (i = 8)]
b328 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 6) \lor (i = 8)]
b329 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 6) \lor (i = 8)]
             [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 6) \lor (i = 8)]
b331 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 6) \lor (i = 8)]
b332 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 8)]
b333 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 8)]
b334 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 8)]
b335 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 8)]
b336 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 6) \lor (i = 8)]
b337 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b338 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b339 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b340 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
             [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b342 \triangleq \left[ i \in 0 ... 63 \mapsto (i=1) \lor (i=2) \lor (i=4) \lor (i=6) \lor (i=8) \right]
b343 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b344 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b345 \triangleq
             [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b346 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b347 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b348 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b349 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b350 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b351 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 8)]
b352 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 5) \lor (i = 6) \lor (i = 8)]
b353 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b354 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b355 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b356 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b357 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b358 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b359 \, \stackrel{\triangle}{=} \, \left[ i \in 0 \, . \, . \, 63 \mapsto (i = 0) \vee (i = 1) \vee (i = 2) \vee (i = 5) \vee (i = 6) \vee (i = 8) \right]
b360 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b361 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b362 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b363 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b364 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b365 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b366 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
```

```
b367 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
             [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b369 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b370 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b371 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b372 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b373 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b374 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
             [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b376 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b377 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b378 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b379 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b380 \triangleq [i \in 0...63 \mapsto (i=2) \lor (i=3) \lor (i=4) \lor (i=5) \lor (i=6) \lor (i=8)]
b381 \ \stackrel{\triangle}{=} \ [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b382 \triangleq [i \in 0..63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b383 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 8)]
b384 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 7) \lor (i = 8)]
b385 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 7) \lor (i = 8)]
b386 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 7) \lor (i = 8)]
b387 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 7) \lor (i = 8)]
b388 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 7) \lor (i = 8)]
b389 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 7) \lor (i = 8)]
b390 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 7) \lor (i = 8)]
b391 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 7) \lor (i = 8)]
b392 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 7) \lor (i = 8)]
b393 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 7) \lor (i = 8)]
b394 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 7) \lor (i = 8)]
b395 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 7) \lor (i = 8)]
b396 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 7) \lor (i = 8)]
b397 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 7) \lor (i = 8)]
b398 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 7) \lor (i = 8)]
b399 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 7) \lor (i = 8)]
b400 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 7) \lor (i = 8)]
b401 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b402 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b403 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b404 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b405 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b406 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b407 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b408 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b409 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b410 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b411 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
```

```
b412 \triangleq [i \in 0...63 \mapsto (i=2) \lor (i=3) \lor (i=4) \lor (i=7) \lor (i=8)]
b413 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b414 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b415 \stackrel{\triangle}{=} [i \in 0..63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 7) \lor (i = 8)]
b416 \triangleq [i \in 0 ... 63 \mapsto (i = 5) \lor (i = 7) \lor (i = 8)]
b417 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b418 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b419 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b420 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b421 \triangleq [i \in 0...63 \mapsto (i=0) \lor (i=2) \lor (i=5) \lor (i=7) \lor (i=8)]
b422 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b423 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b424 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b425 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b426 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b427 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b428 \triangleq [i \in 0...63 \mapsto (i=2) \lor (i=3) \lor (i=5) \lor (i=7) \lor (i=8)]
b429 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b430 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b431 \triangleq
            [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b432 \triangleq [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b433 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b434 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b435 \stackrel{\triangle}{=} [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b436 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b437 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b438 \triangleq [i \in 0..63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b439 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b440 \triangleq [i \in 0...63 \mapsto (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b441 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b442 \triangleq [i \in 0...63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b443 \stackrel{\triangle}{=}
            [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b444 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b445 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b446 \triangleq [i \in 0...63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b447 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 7) \lor (i = 8)]
b448 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 6) \lor (i = 7) \lor (i = 8)]
b449 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b450 \triangleq [i \in 0...63 \mapsto (i = 1) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b451 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b452 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b453 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b454 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b455 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b456 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
```

```
b457 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
            [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b459 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b460 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b461 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b462 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b463 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b464 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
             [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b466 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b467 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b468 \triangleq [i \in 0...63 \mapsto (i=2) \lor (i=4) \lor (i=6) \lor (i=7) \lor (i=8)]
b469 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b470 \triangleq [i \in 0...63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b471 \ \stackrel{\triangle}{=} \ [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b472 \triangleq [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b473 \triangleq [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b474 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b475 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
            [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b477 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b478 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b479 \stackrel{\triangle}{=} [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b480 \triangleq [i \in 0 ... 63 \mapsto (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b481 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b482 \triangleq [i \in 0...63 \mapsto (i = 1) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b483 \triangleq [i \in 0..63 \mapsto (i = 0) \lor (i = 1) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b484 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b485 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b486 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b487 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b488 \triangleq [i \in 0...63 \mapsto (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b489 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b490 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b491 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b492 \triangleq [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b493 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b494 \triangleq [i \in 0...63 \mapsto (i=1) \lor (i=2) \lor (i=3) \lor (i=5) \lor (i=6) \lor (i=7) \lor (i=8)]
b495 \stackrel{\triangle}{=} [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b496 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b497 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b498 \triangleq [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b499 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b500 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b501 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
```

```
b502 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 1) \lor (i = 2) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
 b503 \ \triangleq \ [i \in 0 \ .. \ 63 \mapsto (i=0) \lor (i=1) \lor (i=2) \lor (i=4) \lor (i=5) \lor (i=6) \lor (i=7) \lor (i=8)]
 b504 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b505 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
 b506 \stackrel{\triangle}{=} [i \in 0...63 \mapsto (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
 b507 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 0) \lor (i = 1) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
 b508 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
 b509 \,\stackrel{\triangle}{=}\, [i \in 0 \, . \, . \, 63 \mapsto (i=0) \, \lor \, (i=2) \, \lor \, (i=3) \, \lor \, (i=4) \, \lor \, (i=5) \, \lor \, (i=6) \, \lor \, (i=7) \, \lor \, (i=8)]
 b510 \ \stackrel{\triangle}{=} \ [i \in 0 \ ... \ 63 \mapsto (i=1) \lor (i=2) \lor (i=3) \lor (i=4) \lor (i=5) \lor (i=6) \lor (i=7) \lor (i=8)]
b511 \triangleq [i \in 0...63 \mapsto (i = 0) \lor (i = 1) \lor (i = 2) \lor (i = 3) \lor (i = 4) \lor (i = 5) \lor (i = 6) \lor (i = 7) \lor (i = 8)]
b512 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i = 9)]
BIN \stackrel{\triangle}{=} [b \in \{\text{TRUE}, \text{FALSE}\} \mapsto \text{IF } b \text{ THEN } 1 \text{ ELSE } 0]
 BIN32 \stackrel{\triangle}{=} [f \in BV32 \mapsto BIN[f[0]] * 2^0 + BIN[f[1]] * 2^1 + BIN[f[2]] * 2^2 + BIN[f[3]] * 2^3 + BIN[f[4]] * 2^4 + BIN[f[2]] * 2^4 + BIN[f[3]] * 2^4 + BI
SLR32 \stackrel{\triangle}{=} [f \in BV32 \mapsto [g \in BV32 \mapsto [i \in 0..31 \mapsto
                                                                                            (CMP32[AND32[f][b31])[b31] \land
                                                                                                  (i = 0) \land g[31]
                                                                                            ) \
                                                                                             (CMP32[AND32[f][b31]][b30] \land
                                                                                                  (((i = 0) \land g[30]) \lor ((i = 1) \land g[31]))
                                                                                             (CMP32[AND32[f][b31]][b29] \land
                                                                                                  (((i = 0) \land g[29]) \lor ((i = 1) \land g[30]) \lor ((i = 2) \land g[31]))
                                                                                            (CMP32[AND32[f][b31]][b28] \land
                                                                                                 (((i=0) \land g[28]) \lor ((i=1) \land g[29]) \lor ((i=2) \land g[30]) \lor ((i=3) \land g[31]))
                                                                                            ) \
                                                                                             (CMP32[AND32[f][b31]][b27] \land
                                                                                                 (((i = 0) \land g[27]) \lor ((i = 1) \land g[28]) \lor ((i = 2) \land g[29]) \lor ((i = 3) \land g[30]) \lor ((i = 4) \land g[31]))
                                                                                             (CMP32[AND32[f][b31]][b26] \land
                                                                                                 (((i=0) \land g[26]) \lor ((i=1) \land g[27]) \lor ((i=2) \land g[28]) \lor ((i=3) \land g[29]) \lor ((i=4) \land g[30]) \lor ((i=4) \lor 
                                                                                             (CMP32[AND32[f][b31]][b25] \land
                                                                                                 (((i=0) \land g[25]) \lor ((i=1) \land g[26]) \lor ((i=2) \land g[27]) \lor ((i=3) \land g[28]) \lor ((i=4) \land g[29]) \lor ((i=4) \lor 
                                                                                             (CMP32[AND32[f][b31]][b24] \land
                                                                                                  (((i=0) \land g[24]) \lor ((i=1) \land g[25]) \lor ((i=2) \land g[26]) \lor ((i=3) \land g[27]) \lor ((i=4) \land g[28]) \lor ((i=6) \land g[27]) \lor ((i=4) \land g[28]) \lor ((i=6) \lor 
                                                                                             ) \vee
                                                                                             (CMP32[AND32[f][b31]][b23] \land
                                                                                                  (((i=0) \land g[23]) \lor ((i=1) \land g[24]) \lor ((i=2) \land g[25]) \lor ((i=3) \land g[26]) \lor ((i=4) \land g[27]) \lor ((i=4) \lor 
                                                                                            ) \
```

```
(CMP32[AND32[f][b31]][b22] \land
                  (((i=0) \land g[22]) \lor ((i=1) \land g[23]) \lor ((i=2) \land g[24]) \lor ((i=3) \land g[25]) \lor ((i=4) \land g[26]) \lor ((i=4) \lor 
) \
(CMP32[AND32[f][b31]][b21] \land
                  (((i = 0) \land g[21]) \lor ((i = 1) \land g[22]) \lor ((i = 2) \land g[23]) \lor ((i = 3) \land g[24]) \lor ((i = 4) \land g[25]) \lor ((i
(CMP32[AND32[f][b31]][b20] \land
                  (((i=0) \land g[20]) \lor ((i=1) \land g[21]) \lor ((i=2) \land g[22]) \lor ((i=3) \land g[23]) \lor ((i=4) \land g[24]) \lor ((i=4) \lor 
(CMP32[AND32[f][b31]][b19] \land
                  (((i=0) \land g[19]) \lor ((i=1) \land g[20]) \lor ((i=2) \land g[21]) \lor ((i=3) \land g[22]) \lor ((i=4) \land g[23]) \lor ((i=4) \lor 
(CMP32[AND32[f][b31]][b18] \land
               (((i=0) \land g[18]) \lor ((i=1) \land g[19]) \lor ((i=2) \land g[20]) \lor ((i=3) \land g[21]) \lor ((i=4) \land g[22]) \lor ((i=4) \land g[21]) \lor ((i=4) \lor 
   (CMP32[AND32[f][b31]][b17] \land
               (((i=0) \land g[17]) \lor ((i=1) \land g[18]) \lor ((i=2) \land g[19]) \lor ((i=3) \land g[20]) \lor ((i=4) \land g[21]) \lor ((i=4) \lor 
   (CMP32[AND32[f][b31]][b16] \land
                  (((i=0) \land g[16]) \lor ((i=1) \land g[17]) \lor ((i=2) \land g[18]) \lor ((i=3) \land g[19]) \lor ((i=4) \land g[20]) \lor ((i=4) \land g[19]) \lor ((i=4) \lor 
(CMP32[AND32[f][b31]][b15] \land
                  (((i=0) \land g[15]) \lor ((i=1) \land g[16]) \lor ((i=2) \land g[17]) \lor ((i=3) \land g[18]) \lor ((i=4) \land g[19]) \lor ((i=4) \land g[18]) \lor ((i=4) \lor 
   (CMP32[AND32[f][b31]][b14] \land
                  (((i = 0) \land g[14]) \lor ((i = 1) \land g[15]) \lor ((i = 2) \land g[16]) \lor ((i = 3) \land g[17]) \lor ((i = 4) \land g[18]) \lor ((i
   (CMP32[AND32[f][b31]][b13] \land
                  (((i = 0) \land g[13]) \lor ((i = 1) \land g[14]) \lor ((i = 2) \land g[15]) \lor ((i = 3) \land g[16]) \lor ((i = 4) \land g[17]) \lor ((i
(CMP32[AND32[f][b31]][b12] \land
               (((i = 0) \land g[12]) \lor ((i = 1) \land g[13]) \lor ((i = 2) \land g[14]) \lor ((i = 3) \land g[15]) \lor ((i = 4) \land g[16]) \lor ((i
) \
(CMP32[AND32[f][b31]][b11] \land
               (((i=0) \land g[11]) \lor ((i=1) \land g[12]) \lor ((i=2) \land g[13]) \lor ((i=3) \land g[14]) \lor ((i=4) \land g[15]) \lor ((i=4) \lor 
   (CMP32[AND32[f][b31]][b10] \land
               (((i=0) \land g[10]) \lor ((i=1) \land g[11]) \lor ((i=2) \land g[12]) \lor ((i=3) \land g[13]) \lor ((i=4) \land g[14]) \lor ((i=4) \lor 
   (CMP32[AND32[f][b31])[b9] \land
               (((i=0) \land g[9]) \lor ((i=1) \land g[10]) \lor ((i=2) \land g[11]) \lor ((i=3) \land g[12]) \lor ((i=4) \land g[13]) \lor ((i=4) \lor g
(CMP32[AND32[f][b31])[b8] \land
               (((i = 0) \land g[8]) \lor ((i = 1) \land g[9]) \lor ((i = 2) \land g[10]) \lor ((i = 3) \land g[11]) \lor ((i = 4) \land g[12]) \lor ((i =
```

) \

```
(CMP32[AND32[f][b31])[b4] \land
                                                                                                                                                                                       (((i=0) \land g[4]) \lor ((i=1) \land g[5]) \lor ((i=2) \land g[6]) \lor ((i=3) \land g[7]) \lor ((i=4) \land g[8]) \lor ((i=5)) \lor ((i=5) \lor ((i=
                                                                                                                                                                              (CMP32[AND32[f][b31]][b3] \land
                                                                                                                                                                                       (((i=0) \land g[3]) \lor ((i=1) \land g[4]) \lor ((i=2) \land g[5]) \lor ((i=3) \land g[6]) \lor ((i=4) \land g[7]) \lor ((i=5)) \lor ((i=5) \land g[6]) \lor ((i=6) \lor g
                                                                                                                                                                              (CMP32[AND32[f][b31]][b2] \land
                                                                                                                                                                                     (((i = 0) \land g[2]) \lor ((i = 1) \land g[3]) \lor ((i = 2) \land g[4]) \lor ((i = 3) \land g[5]) \lor ((i = 4) \land g[6]) \lor ((i = 5)) \lor ((i = 1) \land g[6]) \lor ((i = 1) \lor g[6]) 
                                                                                                                                                                              (CMP32[AND32[f][b31]][b1] \land
                                                                                                                                                                                       (((i=0) \land g[1]) \lor ((i=1) \land g[2]) \lor ((i=2) \land g[3]) \lor ((i=3) \land g[4]) \lor ((i=4) \land g[5]) \lor ((i=5)) \lor ((i=5) \land g[4]) \lor ((i=1) \land g[5]) \lor ((i=5) \lor g
                                                                                                                                                                            (CMP32[AND32[f][b31]][b0] \land g[i])
                                                                                                       ]]]
                              xR11[0, 32] := \{(xR8 \stackrel{\Delta}{=} 69)(xR13[0, 32])\} +
                              \{[xR8 \stackrel{\Delta}{=} 194][(0 \ xR12[15, 23] \ 2)(xR12[28, 32]) + (xR12[15, 23] \stackrel{\Delta}{=} 59)(xR12[32, 40])]\} + (xR12[15, 23] \stackrel{\Delta}{=} 194[(0 \ xR12[15, 23] \ 2)(xR12[28, 32]) + (xR12[15, 23] \stackrel{\Delta}{=} 194)(xR12[32, 40])]\} + (xR12[32, 40])
                              \{(xR8 \stackrel{\Delta}{=} 192)(xR12[15, 23] \stackrel{\Delta}{=} 32)(xR13[32, 64])\} +
                              \{\neg(xR8 \stackrel{\Delta}{=} 69)\neg(xR8 \stackrel{\Delta}{=} 192)\neg(xR8 \stackrel{\Delta}{=} 194)(xR11[0, 32])\}
                              xR11 := \{(xR8 \stackrel{\Delta}{=} 128)(RCF[3, 5] \stackrel{\Delta}{=} 0)(RIP)mem\} +
                              \{\neg(xR8 \stackrel{\Delta}{=} 128)(xR11)\}
              xR12[15, 22]
xR12\_15\_22 \triangleq [i \in 0...63 \mapsto ((i = 0) \land xR12[15]) \lor ((i = 1) \land xR12[16]) \lor ((i = 2) \land xR12[17]) \lor ((i = 3) \land xR12[
              xR12[28, 31]
  x\overline{R12\_28\_31} \ \stackrel{\triangle}{=} \ [i \in 0 \ .. \ 63 \mapsto ((i=0) \land xR12[28]) \lor ((i=1) \land xR12[29]) \lor ((i=2) \land xR12[30]) \lor ((i=3) \lor xR12[30]) \lor ((i=3) \lor xR12[30]) \lor ((i=3) \lor xR12[30]) \lor ((i=
              xR12[32, 39]
xR12\_32\_39 \triangleq [i \in 0...63 \mapsto ((i = 0) \land xR12[32]) \lor ((i = 1) \land xR12[33]) \lor ((i = 2) \land xR12[34]) \lor ((i = 3) \land xR12[34])
                xR13[32, 63]
xR13\_32\_63 \triangleq [i \in 0..63 \mapsto ((i = 0) \land xR13[32]) \lor ((i = 1) \land xR13[33]) \lor ((i = 2) \land xR13[34]) \lor ((i = 3) \land xR13[3
RCF\_3\_4 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto ((i = 0) \land RCF[3]) \lor ((i = 1) \land RCF[4])]
           (0 \ xR12[15, 22] \ 2)
zero\_gte\_xR12\_15\_22\_lte\_two \triangleq CMP64[xR12\_15\_22][b0] \lor CMP64[xR12\_15\_22][b1] \lor CMP64[xR12\_15\_22][b1]
```

 $(((i=0) \land g[7]) \lor ((i=1) \land g[8]) \lor ((i=2) \land g[9]) \lor ((i=3) \land g[10]) \lor ((i=4) \land g[11]) \lor ((i=4) \lor g[1$

 $(((i=0) \land g[6]) \lor ((i=1) \land g[7]) \lor ((i=2) \land g[8]) \lor ((i=3) \land g[9]) \lor ((i=4) \land g[10]) \lor ((i=5) \lor g[10$

 $(((i=0) \land g[5]) \lor ((i=1) \land g[6]) \lor ((i=2) \land g[7]) \lor ((i=3) \land g[8]) \lor ((i=4) \land g[9]) \lor ((i=5)) \lor ((i=5) \lor ((i=$

 $(\mathit{CMP}32[\mathit{AND}32[f][\mathit{b}31]][\mathit{b}7] \land \\$

 $(CMP32[AND32[f][b31]][b6] \land$

 $(CMP32[AND32[f][b31]][b5] \land$

```
((i \ge 0) \land (i \le 31)) \land
                                                                   (xR8 = 69) \land (xR13[0, 31])
                                                             (CMP64[xR8][b69] \wedge xR13[i]) \vee
                                                                 (xR8 = 194) \land [(0 xR12[15, 22] 2) \land (xR12[28, 31]) \lor (xR12[15, 22] = 59) \land (xR12[32, 39])]
                                                            (CMP64[xR8][b194] \land ((zero\_gte\_xR12\_15\_22\_lte\_two \land xR12\_28\_31[i]) \lor (CMP64[xR12\_15\_22][b58]
                                                                  (xR8 = 192) \land (xR12[15, 22] = 32) \land xR13[32, 63]
                                                            (CMP64[xR8][b192] \land CMP64[xR12\_15\_22][b32] \land xR13\_32\_63[i]) \lor
                                                                 (xR8 = 128) \land (RCF[3, 4] = 0) \land MEM[RIP]
                                                            (CMP64[xR8][b128] \land CMP64[RCF\_3\_4][b0] \land MEM[BIN32[RIP]][i]) \lor
                                                                 \neg(xR8 = 69) \land \neg(xR8 = 192) \land \neg(xR8 = 194) \land \neg(xR8 = 128) \land xR11[0, 31]
                                                           (\neg CMP64[xR8][b69] \land \neg CMP64[xR8][b194] \land \neg CMP64[xR8][b192] \land \neg CMP64[xR8][b128] \land xR11[i] \land 
                   ) \lor
                                              xR11[32, 63]
                                        ((i \ge 32) \land (i \le 63)) \land
                                                                  (xR8=128) \ \land \ (RCF[3,\,4]=0) \ \land \mathit{MEM}[\mathit{RIP}]
                                                            (CMP64[xR8][b128] \land CMP64[RCF\_3\_4][b0] \land MEM[BIN32[RIP]][i]) \lor
                                                                 \neg(xR8 = 128) \land (xR11)
                                                            (\neg CMP64[xR8][b128] \land xR11[i])
                   )]
               INSTRUCTION\_FORMAT\_CORRECT :=
                                   xR11[0, 8] 	ext{ } 67] 	ext{ } [xR11[40, 64] 	ext{ } \stackrel{\Delta}{=} 	ext{ } 0] +
                                    [76 xR11[0, 8] 78] [xR11[8, 64] \stackrel{\Delta}{=} 0]
      xR11[0, 7]
xR11\_0\_7 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto (i \ge 0) \land (i \le 7) \land xR11[i]]
xR11\_8\_63 \triangleq [i \in 0..63 \mapsto ((i = 0) \land xR11[8]) \lor ((i = 1) \land xR11[9]) \lor ((i = 2) \land xR11[10]) \lor ((i = 3) \land xR11[10])
     xR11[13, 63]
```

 $xR11 \stackrel{\triangle}{=} [i \in 0 ... 63 \mapsto$

xR11[0, 31]

```
xR11\_13\_63 \stackrel{\triangle}{=} [i \in 0..63 \mapsto ((i = 0) \land xR11[13]) \lor ((i = 1) \land xR11[14]) \lor ((i = 2) \land xR11[15]) \lor ((i = 3) \land 
           xR11[16, 63]
xR11\_16\_63 \triangleq [i \in 0...63 \mapsto ((i = 0) \land xR11[16]) \lor ((i = 1) \land xR11[17]) \lor ((i = 2) \land xR11[18]) \lor ((i = 3) \land xR11[18])
           xR11[18, 63]
 xR11\_18\_63 \triangleq [i \in 0...63 \mapsto ((i = 0) \land xR11[18]) \lor ((i = 1) \land xR11[19]) \lor ((i = 2) \land xR11[20]) \lor ((i = 3) \land xR11[20])
           xR11[23, 26]
 xR11\_23\_26 \triangleq [i \in 0...63 \mapsto ((i = 0) \land xR11[23]) \lor ((i = 1) \land xR11[24]) \lor ((i = 2) \land xR11[25]) \lor ((i = 3) \land xR11[25])
            xR11[40, 63]
 xR11\_40\_63 \stackrel{\triangle}{=} [i \in 0...63 \mapsto ((i = 0) \land xR11[40]) \lor ((i = 1) \land xR11[41]) \lor ((i = 2) \land xR11[42]) \lor ((i = 3) \land
           xR11[45, 63]
xR11\_45\_63 \triangleq [i \in 0...63 \mapsto ((i = 0) \land xR11[45]) \lor ((i = 1) \land xR11[46]) \lor ((i = 2) \land xR11[47]) \lor ((i = 3) \land xR11[47])
            xR11[50, 63]
xR11\_50\_63 \stackrel{\triangle}{=} [i \in 0...63 \mapsto ((i = 0) \land xR11[50]) \lor ((i = 1) \land xR11[51]) \lor ((i = 2) \land xR11[52]) \lor ((i = 3) \land xR11[50]) \lor ((i = 3) \land
xR11\_59\_63 \triangleq [i \in 0...63 \mapsto ((i = 0) \land xR11[59]) \lor ((i = 1) \land xR11[60]) \lor ((i = 2) \land xR11[61]) \lor ((i = 3) \land xR11[60])
            (0 \ xR11[0, 7] \ 2)
zero\_gte\_xR11\_0\_7\_lte\_two \triangleq CMP64[xR11\_0\_7][b0] \lor CMP64[xR11\_0\_7][b1] \lor CMP64[xR11\_0\_7][b2]
 nine\_gte\_xR11\_0\_7\_lte\_ten \triangleq CMP64[xR11\_0\_7][b9] \lor CMP64[xR11\_0\_7][b10]
         (17 \ xR11[0, 7] \ 33)
 seventeen\_gte\_xR11\_0\_7\_lte\_thirtytthree \ \stackrel{\triangle}{=} \ CMP64[xR11\_0\_7][b17] \lor CMP64[xR11\_0\_7][b18] \lor CMP64[xR11\_0\_7][b18]
           (51 \ xR11[0, 7] \ 53)
fiftyone\_gte\_xR11\_0\_7\_lte\_fiftythree \triangleq CMP64[xR11\_0\_7][b51] \lor CMP64[xR11\_0\_7][b52] \lor CMP6
         (60 \ xR11[0, 7] \ 67)
 sixty\_qte\_xR11\_0\_7\_lte\_sixtyseven \triangleq CMP64[xR11\_0\_7][b60] \lor CMP64[xR11\_0\_7][b61] \lor CMP64[xR11\_0\_7][b60]
         (76 \ xR11[0, 7] \ 78)
 seventysix\_gte\_xR11\_0\_7\_lte\_seventyeight \triangleq CMP64[xR11\_0\_7][b76] \lor CMP64[xR11\_0\_7][b77] \lor 
 INSTRUCTION\_FORMAT\_CORRECT \triangleq
                                                (0 \ xR11[0, 7] \ 2) \land [(xR11[23, 26] = 1) \lor (xR11[23, 26] = 2) \lor (xR11[23, 26] = 4) \lor (xR11[23, 26] = 8)] \land \ [xR11[59, 63] = 0) \land \ [xR11[59, 63] = 0)
                                     (zero\_gte\_xR11\_0\_7\_lte\_two \wedge (CMP64[xR11\_23\_26][b1] \vee CMP64[xR11\_23\_26][b2] 
                                                 [9 \ xR11[0,\ 7] \ 10] \ \land \ [xR11[50,\ 63] = 0] \ \lor \ [17 \ xR11[0,\ 7] \ 33] \ \land \ [xR11[18,\ 63] = 0] \ \lor \ [xR11[0,\ 7] = 44] \ \land \ [xR11[45,\ 63] = 0] \ \lor \ [xR11[45,
                                     (nine\_gte\_xR11\_0\_7\_lte\_ten \land CMP64[xR11\_50\_63][b0]) \lor (seventeen\_gte\_xR11\_0\_7\_lte\_thirtytthree \land CMP64[xR11\_50\_63][b0]) \lor (seventeen\_gte\_xR11\_0\_7\_lte\_thirtythree \land CMP64[xR11\_50\_63][b0]) \lor (seventeen\_gte\_xR11\_50\_63][b0]
                                               (fiftyone\_gte\_xR11\_0\_7\_lte\_fiftythree \land CMP64[xR11\_13\_63][b0]) \lor (CMP64[xR11\_0\_7][b59] \land CMP64[xR11\_0][b59]
                                               [76 \ xR11[0, 7] \ 78] \land [xR11[8, 63] = 0]
                                   (seventysix\_gte\_xR11\_0\_7\_lte\_seventyeight \land CMP64[xR11\_8\_63][b0])
                      xR12[0, 1] = \{[xR8 \stackrel{\triangle}{=} 192][(xR12[15, 23] \stackrel{\triangle}{=} 31) + (xR12[15, 23] \stackrel{\triangle}{=} 33) + (xR12[15, 23] \stackrel{\triangle}{=} 31) + (xR12[15, 23] \stackrel{\triangle}{=} 31
                      52) + (59 xR12[15, 23] 60)] +
                      \{(xR8 \stackrel{\Delta}{=} 68)\} + \{(xR8 \stackrel{\Delta}{=} 69)\} + \{(xR8 \stackrel{\Delta}{=} 72)\} +
                      \{(xR8 \stackrel{\Delta}{=} 65)(xR12[0, 1])\}
```

 $xR12[1, 2] = \{[2 \ xR8 \ 31][\neg(xR13[0, 32] \stackrel{\Delta}{=} 0) + (xR12[2, 3])][xR12[2, 3]]\} +$

 $\{(xR8 \stackrel{\Delta}{=} 65)(xR12[0, 1] + xR12[1, 2])\} +$

 $\{(33 \ xR8 \ 63)(xR12[2, 3])\} +$

```
\{[(xR8 \stackrel{\Delta}{=} 66) \mid (xR8 \stackrel{\Delta}{=} 32)][xR12[1, 2]]\}
                                                                                                                                                                               \{[xR8]\}
                                                                                                                                                                                                                                                                                                                                                                                                                                                              32][(xR13[(xR8)(31)])(xR14[(xR8)(31)])
     (xR12[1, 2])((xR13[(xR8)(31)]) + (xR14[(xR8)(31)]))] +
      \{ [33 \quad xR8 \quad 63][(xR13[(xR8)(31)])(xR14[(xR8)(31)]) \ + \ (xR12[2,\,3])((xR13[(xR8)(31)]) \ + \ (xR12[2,\,3])((xR13[(xR8)(xR13[(xR8)(xR13[(xR13[(xR8)(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(xR13[(
     (xR14[(xR8)(31)]))} +
     \{[(xR8 \stackrel{\Delta}{=} 64) | (2 xR8 31) | (xR8 \stackrel{\Delta}{=} 71)][xR12[2, 3]]\}
     xR12[3, 4] = \{(xR8 \stackrel{\Delta}{=} 66)(xR13[31, 32])\} +
   \{(32 \ xR8 \ 64)(xR12[3, 4])\}
     xR12[4, 5] = \{(xR8 \stackrel{\triangle}{=} 66)(xR14[31, 32])\} +
     (32 \ xR8 \ 64) \ (xR12[4, 5])
     xR12[5, 6] = \{(xR8 \stackrel{\triangle}{=} 67) \neg (xR11[0, 32] \stackrel{\triangle}{=} 0) \neg (xR15[0, 32] \stackrel{\triangle}{=} 0) \neg (xR11[0, 
 1)\neg (xR15[0, 32] \stackrel{\triangle}{=} 1)(xR11[31, 32])\} + \{\neg (xR8 \stackrel{\triangle}{=} 67)(xR12[5, 6])\}
     xR12[6, 7] = \{(xR8 \stackrel{\triangle}{=} 67) \neg (xR11[0, 32] \stackrel{\triangle}{=} 0) \neg (xR15[0, 32] \stackrel{\triangle}{=} 0) \neg (xR11[0, 
 1)\neg (xR15[0, 32] \stackrel{\triangle}{=} 1)(xR15[31, 32])\} + \{\neg (xR8 \stackrel{\triangle}{=} 67)(xR12[6, 7])\}
\begin{array}{l} xR12[7,\,8] = \{(xR8 \ \stackrel{\triangle}{=}\ 193)(xR12[63,\,64])\} + \\ \{[xR8 \ \stackrel{\triangle}{=}\ 67][\neg(xR11[0,\,32] \ \stackrel{\triangle}{=}\ 0)\neg(xR11[0,\,32] \ \stackrel{\triangle}{=}\ 1)(xR15[0,\,32] \ \stackrel{\triangle}{=}\ 1)(xR11[31,\,32]) + \\ \neg(xR15[0,\,32] \ \stackrel{\triangle}{=}\ 0)\neg(xR15[0,\,32] \ \stackrel{\triangle}{=}\ 1)(xR15[31,\,32])]\} + \end{array}
     \{(xR8 \stackrel{\triangle}{=} 73)(xR13[31, 32])\} +
   \{[xR8 \quad \stackrel{\Delta}{=} \quad 66] \neg [xR12[1, 2]][\neg (xR13[0, 32] \quad \stackrel{\Delta}{=} \quad 0)(xR14[0, 32] \quad \stackrel{\Delta}{=} \quad 0)(xR13[31, 32]) + (xR13[0, 32] \quad \stackrel{\Delta}{=} \quad 0)(xR13[31, 32]) + (xR13[31, 32]) + (xR1
     (xR13[0, 32] \stackrel{\Delta}{=} 0) \neg (xR14[0, 32] \stackrel{\Delta}{=} 0) (xR14[31, 32])]\} +
                                                                                                                                                                                                                                                                                                                                                                                          64 \neg [(xR13[31, 32]) \neg (xR12[3, 4]) \neg (xR12[4, 5])
   \neg (xR13[31, 32])(xR12[3, 4])(xR12[4, 5])][xR13[31, 32]]\} +
   \{\neg(xR8 \stackrel{\triangle}{=} 64)\neg(xR8 \stackrel{\triangle}{=} 66)\neg(xR8 \stackrel{\triangle}{=} 67)\neg(xR8 \stackrel{\triangle}{=} 73)\neg(xR8 \stackrel{\triangle}{=} 193)(xR12[7, 8])\}
     xR12[9, 10] = \{(xR8 \stackrel{\Delta}{=} 193)(xR12[32, 64] \stackrel{\Delta}{=} 0)\} +
 \{[xR8 \stackrel{\Delta}{=} 67][(xR11[0, 32] \stackrel{\Delta}{=} 0) + (xR15[0, 32] \stackrel{\Delta}{=} 0)]\} +
     \{(xR8 \stackrel{\triangle}{=} 73)(xR13[0, 32] \stackrel{\triangle}{=} 0)\} +
     \{(xR8 \stackrel{\Delta}{=} 66)(xR13[0, 32] \stackrel{\Delta}{=} 0)(xR14[0, 32] \stackrel{\Delta}{=} 0)\} +
                                                                                                                                                                                                                                                                                                                                                                                          64]¬[(xR13[31, 32])¬(xR12[3, 4])¬(xR12[4, 5])
   \neg (xR13[31, 32])(xR12[3, 4])(xR12[4, 5])][xR13[31, 32]][xR13[0, 32] \stackrel{\triangle}{=} 0]\} +
 \{\neg(xR8 \stackrel{\triangle}{=} 64)\neg(xR8 \stackrel{\triangle}{=} 66)\neg(xR8 \stackrel{\triangle}{=} 67)\neg(xR8 \stackrel{\triangle}{=} 73)\neg(xR8 \stackrel{\triangle}{=} 193)(xR12[9, 10])\}
   xR12[15, 23] = \{(xR8 \stackrel{\Delta}{=} 160)(INSTRUCTION\_FORMAT\_CORRECT)(xR11[0, 8])\} +
   \{\neg(xR8 \stackrel{\triangle}{=} 160)(xR12[15, 23])\}
   xR12[23, 28] = \{(xR8 \stackrel{\triangle}{=} 160)(INSTRUCTION\_FORMAT\_CORRECT)(xR11[8, 13])\} +
   \{\neg(xR8 \stackrel{\triangle}{=} 160)(xR12[23, 28])\}
   xR12[28, 32] = \{(xR8 \stackrel{\triangle}{=} 160)(INSTRUCTION\_FORMAT\_CORRECT)(xR11[23, 27])\} + (xR12[28, 32]) + (xR12[28, 
   \{\neg(xR8 \stackrel{\Delta}{=} 160)(xR12[28, 32])\}
   xR12[32, 64] = \{[xR8 \stackrel{\Delta}{=} 224][(xR12[15, 23] \stackrel{\Delta}{=} 0) + (xR12[15, 23] \stackrel{\Delta}{=} 9)][0 \ xR12[32, 64] \}
   0x2000000][(0 \ xR12[32, 64] \ 0x2000000)(xR12[32, 64])]mem\} +
   \{(xR8 \ \stackrel{\Delta}{=}\ 225)(xR12[15,\ 23] \ \stackrel{\Delta}{=}\ 59)[xR12[32,\ 64](xR8 \ \stackrel{\Delta}{=}\ 225)(xR12[15,\ 23] \ \stackrel{\Delta}{=}\ 59)]mem\} + (xR8) \ \stackrel{\Delta}{=}\ 225)(xR12[15,\ 23] \ \stackrel{\Delta}{=}\ 59)[xR12[32,\ 64](xR8) \ \stackrel{\Delta}{=}\ 225)(xR12[15,\ 23] \ \stackrel{\Delta}{=}\ 59)[xR12[15,\ 23] \ \stackrel{\Delta}{=}\ 5
 \{(xR8 \stackrel{\triangle}{=} 160)(INSTRUCTION\_FORMAT\_CORRECT)(xR11[8, 40])\} +
   \{[xR8 \stackrel{\Delta}{=} 167][(xR11[0, 8] \stackrel{\Delta}{=} 44)(xR11[13, 45]) + (9 xR11[0, 8] < 10)(xR11[18, 50]) + (0 xR11[18, 50]) + (0 xR11[18,
 xR11[0, 8] < 2)(xR11[27, 59])] +
```

```
\{(xR8 \stackrel{\Delta}{=} 194) \neg (xR12[15, 23] \stackrel{\Delta}{=} 33) \neg (xR12[15, 23] \}
                                                                                                                                                                                                                                                                                                                                                                                            59)\neg(xR12[15, 23]
             60)(xR13[0, 32]) +
             \begin{cases} [xR8 \stackrel{\triangle}{=} 192][(xR12[15, 23] \stackrel{\triangle}{=} 24)(xR13[32, 64])(xR14[32, 64]) + (xR12[15, 23] \stackrel{\triangle}{=} 25)((xR13[32, 64]) + (xR14[32, 64])) + (xR12[15, 23] \stackrel{\triangle}{=} 26)((xR13[32, 64]) \neg (xR14[32, 64]) + (xR12[15, 23] \stackrel{\triangle}{=} 27)((xR13[32, 64])((xR14[32, 64])(31))) + (xR12[32, 64])(xR14[32, 64]) \end{cases} 
                                                                                                                                                               28)((xR13[32, 64]))((xR14[32, 64])(31))) + (xR12[15, 23])
             29)((xR13[32, 64])) > ((xR14[32, 64])(31))) + (xR12[15, 23] \stackrel{\triangle}{=} 51) \neg (xR13[32, 64])]
              \{[(xR8 \stackrel{\Delta}{=} 196) + (xR8 \stackrel{\Delta}{=} 197)][xR13[0, 32]]\} +
             \{\neg(xR8 \ \stackrel{\triangle}{=}\ 160)\neg(xR8 \ \stackrel{\triangle}{=}\ 167)\neg(xR8 \ \stackrel{\triangle}{=}\ 192)\neg(xR8 \ \stackrel{\triangle}{=}\ 194)\neg(xR8 \ \stackrel{\triangle}{=}\ 196)\neg(xR8 \ \stackrel{\triangle}{=}\ 196)\}
             197) \neg (xR8 \stackrel{\Delta}{=} 224) \neg (xR8 \stackrel{\Delta}{=} 225)(xR12[32, 64]) \}
  xR12 \stackrel{\Delta}{=} [i \in 0 ... 63 \mapsto
                       (
                                                     xR12[0]
                                              (i=0) \land
                                                                             [xR8 = 192] \ \land [(xR12[15, 22] = 31) \lor (xR12[15, 22] = 33) \lor (xR12[15, 22] = 52) \lor (59 \ \ xR12[15, 22] = 60)]
                                                                      (\mathit{CMP64}[\mathit{xR8}][\mathit{b192}] \land (\mathit{CMP64}[\mathit{xR12\_15\_22}][\mathit{b31}] \lor \mathit{CMP64}[\mathit{xR12\_15\_22}][\mathit{b33}] \lor \mathit{CMP64}[\mathit{xR12\_15\_22}][\mathit{b31}] \lor \mathit{CMP64}[\mathit{xR12\_15\_22}][\mathit{xM12\_15\_22}][\mathit{xM12\_15\_22}][\mathit{xM12\_15\_22}][\mathit{xM12\_15\_22}][\mathit{xM12\_15\_22}][\mathit{xM12\_15\_2
                                                                           (xR8 = 68) \lor (xR8 = 69) \lor (xR8 = 72)
                                                                      (CMP64[xR8][b68] \lor CMP64[xR8][b69] \lor CMP64[xR8][b72]) \lor
                                                                           (xR8 = 65) \land (xR12[0])
                                                                     (CMP64[xR8][b65] \wedge xR12[0])
                                                     xR12[1]
                                               (i=1) \wedge
                      )
xR12[0, 1] = \{[xR8 \stackrel{\Delta}{=} 192][(xR12[15, 23] \stackrel{\Delta}{=} 31) + (xR12[15, 23] \stackrel{\Delta}{=} 33) + (xR12[15, 23] \stackrel{\Delta}{=} 33
52) + (59 \ xR12[15, 23] \ 60)] +
 \{(xR8 \stackrel{\Delta}{=} 68)\} + \{(xR8 \stackrel{\Delta}{=} 69)\} + \{(xR8 \stackrel{\Delta}{=} 72)\} +
 \{(xR8 \stackrel{\Delta}{=} 65)(xR12[0, 1])\}
 xR12[1, 2] = \{[2 \ xR8 \ 31][\neg(xR13[0, 32] \stackrel{\triangle}{=} 0) + (xR12[2, 3])][xR12[2, 3]]\} +
 \{(xR8 \stackrel{\Delta}{=} 65)(xR12[0, 1] + xR12[1, 2])\} +
 \{(33 \ xR8 \ 63)(xR12[2, 3])\} +
 \{[(xR8 \stackrel{\Delta}{=} 66) | (xR8 \stackrel{\Delta}{=} 32)][xR12[1, 2]]\}
                                                                                                                     \{[xR8]
                                                                                                                                                                                                                                                                                   32][(xR13[(xR8)(31)])(xR14[(xR8)(31)])
 (xR12[1, 2])((xR13[(xR8)(31)]) + (xR14[(xR8)(31)]))] +
                                        xR8
                                                                                             63][(xR13[(xR8)(31)])(xR14[(xR8)(31)]) + (xR12[2, 3])((xR13[(xR8)(31)]) +
 (xR14[(xR8)(31)]))] +
\{[(xR8 \stackrel{\Delta}{=} 64) | (2 xR8 31) | (xR8 \stackrel{\Delta}{=} 71)][xR12[2, 3]]\}
```

```
xR12[3, 4] = \{(xR8 \stackrel{\Delta}{=} 66)(xR13[31, 32])\} +
\{(32 \ xR8 \ 64)(xR12[3, 4])\}
 xR12[4, 5] = \{(xR8 \stackrel{\Delta}{=} 66)(xR14[31, 32])\} +
 (32 \ xR8 \ 64) \ (xR12[4, 5])
  xR12[5, 6] = \{(xR8 \stackrel{\Delta}{=} 67) \neg (xR11[0, 32] \stackrel{\Delta}{=} 0) \neg (xR15[0, 32] \stackrel{\Delta}{=} 0) \neg (xR11[0, 32] 
 1)\neg (xR15[0, 32] \stackrel{\Delta}{=} 1)(xR11[31, 32])\} +
  \{\neg (xR8 \stackrel{\Delta}{=} 67)(xR12[5, 6])\}
 xR12[6, 7] = \{(xR8 \stackrel{\Delta}{=} 67) \neg (xR11[0, 32] \stackrel{\Delta}{=} 0) \neg (xR15[0, 32] \stackrel{\Delta}{=} 0) \neg (xR11[0, 
1)\neg(xR15[0, 32] \stackrel{\triangle}{=} 1)(xR15[31, 32])\} +
 \{\neg (xR8 \stackrel{\Delta}{=} 67)(xR12[6, 7])\}
 xR12[7, 8] = \{(xR8 \stackrel{\triangle}{=} 193)(xR12[63, 64])\} +
\{[xR8 \stackrel{\triangle}{=} 67][\neg(xR11[0, 32] \stackrel{\triangle}{=} 0)\neg(xR11[0, 32] \stackrel{\triangle}{=} 1)(xR15[0, 32] \stackrel{\triangle}{=} 1)(xR11[31, 32]) + (xR11[31, 32]) + 
  \neg (xR15[0, 32] \stackrel{\triangle}{=} 0) \neg (xR15[0, 32] \stackrel{\triangle}{=} 1)(xR11[0, 32] \stackrel{\triangle}{=} 1)(xR15[31, 32])] \} +
  \{(xR8 \stackrel{\triangle}{=} 73)(xR13[31, 32])\} +
 \{[xR8 \stackrel{\Delta}{=} 66] \neg [xR12[1, 2]][\neg (xR13[0, 32] \stackrel{\Delta}{=} 0)(xR14[0, 32] \stackrel{\Delta}{=} 0)(xR13[31, 32]) + (xR13[0, 32] \stackrel{\Delta}{=} 0)(xR13[31, 32]) + (xR13[31, 32]) + (xR13[31,
 0)\neg(xR14[0, 32] \stackrel{\Delta}{=} 0)(xR14[31, 32])]\} +
 \{[xR8]
                                                                                                                                                                                                                                                                                                                  64 \neg [(xR13[31, 32]) \neg (xR12[3, 4]) \neg (xR12[4, 5])
     \neg (xR13[31, 32])(xR12[3, 4])(xR12[4, 5])][xR13[31, 32]]\} + \{ \neg (xR8 \stackrel{\triangle}{=} 64) \neg (xR8 \stackrel{\triangle}{=} 66) \neg (xR8 \stackrel{\triangle}{=} 67) \neg (xR8 \stackrel{\triangle}{=} 73) \neg (xR8 \stackrel{\triangle}{=} 193)(xR12[7, 8])\} 
 xR12[9, 10] = \{(xR8 \stackrel{\triangle}{=} 193)(xR12[32, 64] \stackrel{\triangle}{=} 0)\} +
  \{[xR8 \stackrel{\Delta}{=} 67][(xR11[0, 32] \stackrel{\Delta}{=} 0) + (xR15[0, 32] \stackrel{\Delta}{=} 0)]\} +
 \{(xR8 \stackrel{\triangle}{=} 73)(xR13[0, 32] \stackrel{\triangle}{=} 0)\} +
 \{(xR8 \stackrel{\triangle}{=} 66)(xR13[0, 32] \stackrel{\triangle}{=} 0)(xR14[0, 32] \stackrel{\triangle}{=} 0)\} +
                                                                                                                                                                                                                                                                                                          64]¬[(xR13[31, 32])¬(xR12[3, 4])¬(xR12[4, 5])
  \neg (xR13[31, 32])(xR12[3, 4])(xR12[4, 5])[[xR13[31, 32]][xR13[0, 32] \stackrel{\triangle}{=} 0]] +
  \{\neg(xR8 \stackrel{\Delta}{=} 64)\neg(xR8 \stackrel{\Delta}{=} 66)\neg(xR8 \stackrel{\Delta}{=} 67)\neg(xR8 \stackrel{\Delta}{=} 73)\neg(xR8 \stackrel{\Delta}{=} 193)(xR12[9, 10])\}
 xR12[15, 23] = \{(xR8 \stackrel{\Delta}{=} 160)(INSTRUCTION\_FORMAT\_CORRECT)(xR11[0, 8])\} +
  \{\neg(xR8 \stackrel{\Delta}{=} 160)(xR12[15, 23])\}
 xR12[23, 28] = \{(xR8 \stackrel{\triangle}{=} 160)(INSTRUCTION\_FORMAT\_CORRECT)(xR11[8, 13])\} +
 \{\neg(xR8 \stackrel{\Delta}{=} 160)(xR12[23, 28])\}
xR12[28, 32] = \{(xR8 \stackrel{\Delta}{=} 160)(INSTRUCTION\_FORMAT\_CORRECT)(xR11[23, 27])\} +
 \{\neg (xR8 \stackrel{\Delta}{=} 160)(xR12[28, 32])\}
xR12[32, 64] = \{[xR8 \stackrel{\triangle}{=} 224][(xR12[15, 23] \stackrel{\triangle}{=} 0) + (xR12[15, 23] \stackrel{\triangle}{=} 9)][0 \ xR12[32, 64] \}
0x2000000][(0 \ xR12[32, 64] \ 0x2000000)(xR12[32, 64])]mem\} +
 \{(xR8 \stackrel{\Delta}{=} 225)(xR12[15, 23] \stackrel{\Delta}{=} 59)[xR12[32, 64](xR8 \stackrel{\Delta}{=} 225)(xR12[15, 23] \stackrel{\Delta}{=} 59)]mem\} + (xR8 \stackrel{\Delta}{=} 225)(xR12[15, 23] \stackrel{\Delta}{=} 59)[mem] + (xR12[15, 23
 \{(xR8 \stackrel{\triangle}{=} 160)(INSTRUCTION\_FORMAT\_CORRECT)(xR11[8, 40])\} +
 \{[xR8 \stackrel{\Delta}{=} 167][(xR11[0, 8] \stackrel{\Delta}{=} 44)(xR11[13, 45]) + (9 xR11[0, 8] < 10)(xR11[18, 50]) + (0 xR11[18, 50]) + (0 xR11[18,
xR11[0, 8] < 2)(xR11[27, 59])]\} + \{(xR8 \stackrel{\triangle}{=} 194)\neg(xR12[15, 23] \stackrel{\triangle}{=} 33)\neg(xR12[15, 23] \stackrel{\triangle}{=} 59)\neg(xR12[15, 23]
60)(xR13[0, 32]) +
```

```
26)((xR13[32, 64])\neg(xR14[32, 64]) +
                                                                                                                                                                                                               28)((xR13[32, 64]))((xR14[32, 64])(31))) + (xR12[15, 23])
 29)((xR13[32, 64])) > ((xR14[32, 64])(31))) + (xR12[15, 23] \stackrel{\triangle}{=} 51) \neg (xR13[32, 64])]
  \{[(xR8 \stackrel{\Delta}{=} 196) + (xR8 \stackrel{\Delta}{=} 197)][xR13[0, 32]]\} +
    \{\neg(xR8 \stackrel{\Delta}{=} 160)\neg(xR8 \stackrel{\Delta}{=} 167)\neg(xR8 \stackrel{\Delta}{=} 192)\neg(xR8 \stackrel{\Delta}{=} 194)\neg(xR8 \stackrel{\Delta}{=} 196)\neg(xR8 \stackrel{\Delta}{=} 196)
 197) \neg (xR8 \stackrel{\triangle}{=} 224) \neg (xR8 \stackrel{\triangle}{=} 225)(xR12[32, 64]) \}
 xR13[0, 1] := \{(xR8 = 256) \lor (xR8 = 257)\} \lor
  (xR8 = 165) \land 0
    (xR8 = 163) \land 0
  (xR8 = 161) \land 0
 xR13[1, 6] := \{ [(xR8 = 256) \lor (xR8 = 257)] \land xR12[23, 28] \} \lor
 \{(xR8 = 165) \land xR11[18, 23]\} \lor
    \{(xR8 = 163) \land xR11[13, 18]\} \lor
 \{(xR8 = 161) \land xR11[8, 13]\} \lor
 xR13[0, 32] := \{ [(xR8 = 192) \land ((xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 52) \lor (xR12[15,
 (59) \lor (xR12[15, 23] = 60) \lor (xR12[15, 23] = 76)) \land xR14[32, 64] \lor \lor
 \{[(xR8=192) \land ((xR12[15,\,23]=30) \lor (xR12[15,\,23]=31) \lor (xR12[15,\,23]=33))] \land xR13[32,\,64]\} \lor \{[(xR8=192) \land ((xR12[15,\,23]=30) \lor (xR12[15,\,23]=31) \lor (xR12[15,\,23]=33))] \land xR13[32,\,64]\} \lor \{[(xR8=192) \land ((xR12[15,\,23]=30) \lor (xR12[15,\,23]=31) \lor (xR12[15,\,23]=33))] \land xR13[32,\,64]\} \lor \{[(xR8=192) \land ((xR12[15,\,23]=30) \lor (xR12[15,\,23]=31) \lor (xR12[15,\,23]=33))] \land xR13[32,\,64]\} \lor \{[(xR8=192) \land ((xR12[15,\,23]=31) \lor (xR12[15,\,23]=33))] \land xR13[32,\,64]\} \lor \{[(xR8=192) \land ((xR12[15,\,23]=33))] \land xR13[32,\,23]\} \lor \{[(xR8=192) \land ((xR12[15,\,23]=33))] \lor xR13[32,\,23]\} \lor \{[(xR12[15,\,23]=33)] \lor xR13[32,\,23]\} \lor \{[(xR12[15,\,23]=33)] \lor xR13[32]\} \lor \{[(xR12[15,\,23]=33)] \lor xR13[32] \lor 
 \{[(xR8=192) \land ((xR12[15,\,23]=0) \lor (xR12[15,\,23]=1) \lor (xR12[15,\,23]=2) \lor (xR12[15,\,23]=2
 9) \vee (xR12[15, 23] = 10))] \wedge xR12[32, 64]} \vee
 \{(xR8 = 128) \land RIP\} \lor
  \{(xR8=67) \land (xR11[0,\,32]=1) \land (xR15[0,\,32]=0) \land (xR15[0,\,32]=1) \land (xR15[0,\,32])\} \lor (xR15[0,\,32]) \land (xR15[0,\,32]=1) \land (
  \{(xR8 = 67) \land (xR15[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32])\} \lor \{(xR8 = 67) \land (xR15[0, 32] = 1) \land (xR11[0, 32])\} \lor \{(xR8 = 67) \land (xR15[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0, 32] = 1) \land (xR11[0, 32] = 0) \land (xR11[0,
  \{(xR8 = 67) \land [(xR11[0, 32] = 0) \lor (xR15[0, 32] = 0)] \land 0\} \lor
    \{(xR8 = 68) \land [(xR12[5, 6]) \lor (xR12[5, 6] \land xR12[6, 7])] \land 0\} \lor 
    \{(xR8 = 69) \land xR12[6, 7] \land 0\} \lor
    \{(xR8 = 1) \land xR15[0, 1] \land xR11[0, 32]\} \lor
    \{(xR8 = 1) \land xR15[0, 1] \land xR15[1, 2] \land (xR11[0, 32](1)\} \lor
  \{(xR8 = 1) \land xR15[0, 1] \land xR15[1, 2] \land 0\} \lor
    \{(2 xR8 31) \land xR15[xR8] \land 0\} \lor
    \{(2 xR8 31) \land xR15[xR8] \land (xR11[0, 32]\langle xR8)\} \lor
  \{(xR8 = 72) \land 0\} \lor
    \{(xR8 = 66) \land (xR13[0, 32] = 0) \land (xR14[0, 32] = 0) \land xR12[1, 2]\} \lor
    \{(xR8 = 66) \land (xR13[0, 32] = 0) \land (xR14[0, 32] = 0) \land xR12[1, 2] \land xR14[0, 32]\} \lor
    \{(xR8 = 97) \land [
    ((xR13[1, 6] = 0) \land RIP) \lor
    ((xR13[1, 6] = 1) \land RSP) \lor
    ((xR13[1, 6] = 2) \land RBP) \lor
    ((xR13[1, 6] = 3) \land RCF) \lor
    ((xR13[1, 6] = 4) \land R4) \lor
    ((xR13[1, 6] = 5) \land R5) \lor
    ((xR13[1, 6] = 6) \land R6) \lor
  ((xR13[1, 6] = 7) \land R7) \lor
  ((xR13[1, 6] = 8) \land R8) \lor
 ((xR13[1, 6] = 9) \land R9) \lor
 ((xR13[1, 6] = 10) \land R10) \lor
 ((xR13[1, 6] = 11) \land R11) \lor
```

```
((xR13[1, 6] = 12) \land R12) \lor
((xR13[1, 6] = 13) \land R13) \lor
((xR13[1, 6] = 14) \land R14) \lor
((xR13[1,\,6]=15) \land R15) \lor
((xR13[1, 6] = 16) \land R16) \lor
((xR13[1, 6] = 17) \land R17) \lor
((xR13[1, 6] = 18) \land R18) \lor
((xR13[1, 6] = 19) \land R19) \lor
((xR13[1, 6] = 20) \land R20) \lor
((xR13[1, 6] = 21) \land R21) \lor
((xR13[1, 6] = 22) \land R22) \lor
((xR13[1, 6] = 23) \land R23) \lor
((xR13[1, 6] = 24) \land R24) \lor
((xR13[1, 6] = 25) \land R25) \lor
((xR13[1, 6] = 26) \land R26) \lor
((xR13[1, 6] = 27) \land R27) \lor
((xR13[1, 6] = 28) \land R28) \lor
((xR13[1, 6] = 29) \land R29) \lor
((xR13[1, 6] = 30) \land R30) \lor
((xR13[1, 6] = 31) \land R31)]
xR13[0] := \{(xR8 = 32) \land [(xR12[1] \land xR13[0] \land xR14[0]) \lor (xR12[1] \land xR14[0] \land xR14[0]) \lor (xR12[1] \land xR14[0] \lor (xR12[1] \land xR14[0]) \lor (xR12[1] \land xR14[1] \lor (xR12[1]
(xR12[1] \land xR13[0] \land xR14[0]) \lor (xR12[1] \land xR13[0] \land xR14[0])]\}
xR13[xR8 \wedge 31] := \{(33 \ xR8 \ 63) \wedge \}
[(xR12[2] \wedge xR13[xR8 \wedge 31] \wedge xR14[xR8 \wedge 31]) \vee \\
(xR12[2] \wedge xR13[xR8 \wedge 31] \wedge xR14[xR8 \wedge 31]) \vee
 (xR12[2] \land xR13[xR8 \land 31] \land xR14[xR8 \land 31]) \lor
 (xR12[2] \land xR13[xR8 \land 31] \land xR14[xR8 \land 31])]
xR13[32, 64] := \{ [(xR8 = 194) \land ((xR12[15, 23] = 59) \lor (xR12[15, 23] = 60))] \land xR13[0, 32] \}
\{(xR8 = 162) \land xR13[0, 32]\}
xR14[0, 32] := \{(xR8 = 256) \land [(xR12[15, 23] = 0) \lor (xR12[15, 23] = 2) \lor (xR12[15, 23] = 2)
(xR12[15, 23] = 9) \lor (24 \ xR12[15, 23] \ 32) \lor
(xR12[15,\,23]=44) \lor (xR12[15,\,23]=51)] \land xR12[32,\,64]\} \lor
 \{(xR8 = 256) \land (17 \ xR12[15, 23] \ 23) \land xR14[32, 64]\} \lor
 \{(xR8 = 257) \land (xR12[15, 23] = 53) \land xR15[32, 64]\} \lor
\{(xR8 = 192) \land [(0 \ xR12[15, 23] \ 2) \lor (xR12[15, 23] = 9) \lor (xR12[15, 23] = 10)\}
    \lor (xR12[15, 23] = 30) \lor (xR12[15, 23] = 31) \lor (xR12[15, 23] = 33)] \land xR14[32, 64]\} \lor
 \{(xR8 = 192) \land [(xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 59)\}
 \vee (xR12[15, 23] = 60) \vee (xR12[15, 23] = 76) \land 4 \lor \lor
 \{(xR8 = 195) \land (0 \ xR12[15, 23] \ 2) \land xR12[32, 64]\} \lor
 \{(xR8 = 195) \land (xR12[15, 23] = 59) \land INTERUPT\_TABLE\} \lor
\{(xR8 = 128) \land 8\} \lor
\{(xR8 = 68) \land xR12[5, 6] \land xR12[6, 7] \land xR15[0, 32]\} \lor
\{(xR8 = 68) \land xR12[5, 6] \land xR11[0, 32]\} \lor
\{(xR8 = 69) \land xR12[6, 7] \land xR15[0, 32]\} \lor
\{(xR8 = 1) \land xR15[0] \land xR15[1] \land (xR11[0, 32]\langle 1)\} \lor
\{(2 xR8 31) \land [(xR13[0, 32] = 0) \lor xR12[2]] \land xR15[xR8] \land (xR11[0, 32] \lor xR8)\} \lor \{(2 xR8 31) \land [(xR13[0, 32] \lor xR8)] \lor xR12[2]] \land xR13[xR8] \land (xR11[0, 32] \lor xR8)\} \lor \{(2 xR8 31) \land [(xR13[0, 32] \lor xR8)] \lor xR12[2]] \land xR13[xR8] \land (xR11[0, 32] \lor xR8)\} \lor xR12[2] \land xR13[2] \land xR13[
\{(2 \ xR8 \ 31) \land [(xR13[0, 32] = 0) \lor xR12[2]] \land xR15[xR8] \land 0\} \lor
```

```
\{(xR8 = 71) \land xR12[2] \land xR13[31] \land [(xR12[5] \land xR12[6]) \lor (xR12[5] \land xR12[6])] \land xR13[0,\ 32]\} \lor \{(xR8 = 71) \land xR12[2] \land xR13[0,\ 32]\} \lor \{(xR8 = 71) \land xR12[2] \land xR13[31] \land xR
 \{(xR8=65) \wedge [(xR14[0,\,32] \wedge xR12[0]) \vee (xR14[0,\,32] \wedge xR12[0])]\} \vee \\
 xR14[32,\,64] := \{(xR8 = 164) \land xR13[0,\,32]\} \lor
 \{(xR8 = 167) \land [(xR11[0, 8] = 52) \lor (xR11[0, 8] = 53) \lor (xR11[0, 8] = 59) \lor (xR11[0, 8] = 50\} \lor (xR11[0, 8] = 50\} \lor (xR11[0, 8] = 50) \lor (xR11[0,
   (xR11[0, 8] = 60) \lor (xR11[0, 8] = 76)] \land RSP\} \lor
 xR15[0, 32] := \{(xR8 = 192) \land (xR12[15, 23] = 32) \land xR14[32, 64]\} \lor
   \{(xR8 = 194) \land (xR12[15, 23] = 59) \land 4\} \lor
   \{(xR8 = 194) \land [(0 \ xR12[15, 23] \ 2)] \land xR15[32, 64]\} \lor
 \{(xR8 = 70) \land xR13[0, 32]\} \lor
   xR15[32, 64] := \{(xR8 = 224) \land [(xR12[15, 23] = 53) \lor (xR12[15, 23] = 76)] \land (xR12[15, 23] = 76)\}
   (STACK\_MIN \ xR12[32, 64] \ STACK\_MAX) \land MEM[xR12[32, 64]]\} \lor
   \{(xR8 = 166) \land xR13[0, 32]\} \lor
   \{(xR8 = 167) \land [(xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor \}
 (xR12[15,\,23]=59) \lor (xR12[15,\,23]=60) \lor (xR12[15,\,23]=76)] \land RIP\} \lor \\
   RIP := \{(xR8 = 256) \land [(xR12[15, 23] = 63) \lor (xR12[15, 23] = 65) \lor (xR12[15, 23] = 66)]
   \wedge RCF[2] \wedge xR12[32, 64] \rangle \vee
\{(xR8 = 256) \land [(xR12[15, 23] = 62) \lor (xR12[15, 23] = 63) \lor (xR12[15, 23] = 67)]
   \wedge RCF[0] \wedge xR12[32, 64]} \vee
\{(xR8 = 256) \land [(xR12[15, 23] = 64) \lor (xR12[15, 23] = 65) \lor (xR12[15, 23] = 67)\}
   \land RCF[0] \land RCF[2] \land xR12[32, 64] \lor
\{(xR8 = 257) \land (59 \ xR12[15, 23] \ 61) \land xR12[32, 64]\} \lor
 \{(xR8 = 257) \land (xR12[15, 23] = 76) \land xR15[32, 64]\} \lor
 \{(xR8 = 98) \land [[(xR13[1, 6] = 0) \land xR14[0, 32]] \lor [(xR13[1, 6] = 0) \land RIP]]\} \lor \{(xR8 = 98) \land [[(xR13[1, 6] = 0) \land xR14[0, 32]] \lor [(xR13[1, 6] = 0) \land xRIP]]\} \lor \{(xR8 = 98) \land [[(xR13[1, 6] = 0) \land xR14[0, 32]] \lor [(xR13[1, 6] = 0) \land xRIP]]\} \lor \{(xR13[1, 6] = 0) \land xR14[0, 32]] \lor [(xR13[1, 6] = 0) \land xRIP]\}\} \lor \{(xR13[1, 6] = 0) \land xR14[0, 32]] \lor [(xR13[1, 6] = 0) \land xRIP]\}\} \lor \{(xR13[1, 6] = 0) \land xR14[0, 32]] \lor [(xR13[1, 6] = 0) \land xRIP]\}\}
 \{(xR8 = 129) \land xR13[0, 32]\} \lor
   RSP := \{(xR8 = 256) \land [(xR12[15, 23] = 52) \lor (xR12[15, 23] = 53) \lor (xR12[15, 23] = 76)\}
   \land xR12[32, 64] \lor
   \{(xR8 = 256) \land [(xR12[15, 23] = 59) \lor (xR12[15, 23] = 60)] \land xR13[32, 64]\} \lor (xR12[15, 23] = 60)\}
 \{(xR8 = 98) \land [[(xR13[1, 6] = 1) \land xR14[0, 32]] \lor [(xR13[1, 6] = 1) \land RSP]]\} \lor \{(xR8 = 98) \land [[(xR13[1, 6] = 1) \land xR14[0, 32]]\} \lor [(xR13[1, 6] = 1) \land xR14[0, 32]]\} \lor [(xR13[1, 6] = 1) \land xR14[0, 32]] \lor [(xR13[1, 6] = 1) \land xR1
RBP := \{(xR8 = 98) \land [[(xR13[1, 6] = 2) \land xR14[0, 32]] \lor [(xR13[1, 6] = 2) \land RBP]]\} \lor (xR13[1, 6] = 2) \land RBP = \{(xR8 = 98) \land [(xR13[1, 6] = 2) \land xR14[0, 32]] \lor [(xR13[1, 6] = 2) \land xR14[0, 32]) \lor [(xR13[1, 6] = 2) \lor (xR14[1, 
 RCF := \{(xR8 = 98) \land [[(xR13[1, 6] = 3) \land xR14[0, 32]] \lor [(xR13[1, 6] = 3) \land RCF]]\} \lor (xR13[1, 6] = 3) \land RCF = \{(xR8 = 98) \land [(xR13[1, 6] = 3) \land xR14[0, 32]] \lor [(xR13[1, 6] = 3) \land RCF]\}\} \lor (xR13[1, 6] = 3) \land RCF = \{(xR8 = 98) \land [(xR13[1, 6] = 3) \land xR14[0, 32]] \lor [(xR13[1, 6] = 3) \land RCF]\}\} \lor (xR13[1, 6] = 3) \land RCF = \{(xR8 = 98) \land [(xR13[1, 6] = 3) \land xR14[0, 32]] \lor [(xR13[1, 6] = 3) \land RCF]\}\}
 RCF[3,\,5] := \{(xR8 = 224) \land [(xR12[15,\,23] = 0) \lor (xR12[15,\,23] = 1) \lor (xR12[15,\,23] = 9) \lor (xR12[15,\,23] = 1) \lor (xR12[15,\,23] = 9) \lor (xR12[15,\,23] = 1) \lor
 (xR12[15, 23] = 10)] \land (MEM\_MIN \ xR12[32, 64] \ MEM\_MAX) \land 3\} \lor
 \{(xR8 = 224) \land [(xR12[15, 23] = 53) \lor (xR12[15, 23] = 76)]
   \wedge \; (STACK\_MIN \; \; xR12[32, \, 64] \; STACK\_MAX) \wedge 3 \} \; \vee \\
 \{(xR8 = 224) \land [(xR12[15, 23] = 52) \lor (xR12[15, 23] = 59) \lor (xR12[15, 23] = 60)]
    \land (STACK\_MIN \ xR14[32,\,64] \ STACK\_MAX) \land 3 \} \lor \\
   \{(xR8 = 258) \land 0\} \lor
   \{(xR8 = 64) \land [(xR13[31] \land xR12[3] \land xR12[4]) \lor (xR13[31] \land xR12[3] \land xR12[4])] \land 1\} \lor (xR13[31] \land xR12[4]) \land xR12[4] \land xR12
   \{(xR8 = 71) \land (xR12[2] \lor xR13[31]) \land 1\} \lor
   \{(xR8 = 160) \land \neg INSTRUCTION\_FORMAT\_CORRECT \land 2\} \lor 
 \{(xR8 = 161) \land (xR11[0, 8] = 77) \land 0\} \lor
 RCF[0] := \{(xR8 = 258) \land [(24 \ xR12[15, \, 23] \ 33) \lor (xR12[15, \, 23] = 51)] \land xR12[7]\} \lor xR12[7]\} \lor xR12[7] \land xR
   \{(xR8 = 258) \land [(24 \ xR12[15, 23] \ 33) \land (xR12[15, 23] = 51)] \land 0\} \lor
RCF[2] := \{(xR8 = 258) \land [(24 \ xR12[15, \ 23] \ 33) \lor (xR12[15, \ 23] = 51)] \land xR12[9]\} \lor 128 \lor 128
\{(xR8 = 258) \land [(24 \ xR12[15, 23] \ 33) \land (xR12[15, 23] = 51)] \land 0\} \lor
```

```
R4 := \{(xR8 = 98) \land [[(xR13[1, 6] = 4) \land xR14[0, 32]] \lor [(xR13[1, 6] = 4) \land R4]]\} \lor [(xR13[1, 6] = 4) \land R4]\}
R5 := \{(xR8 = 98) \land [[(xR13[1, 6] = 5) \land xR14[0, 32]] \lor [(xR13[1, 6] = 5) \land R5]]\} \lor [(xR13[1, 6] = 5) \land R5]]\} \lor [(xR13[1, 6] = 5) \land R5]\}
R6 := \{(xR8 = 98) \land [[(xR13[1, 6] = 6) \land xR14[0, 32]] \lor [(xR13[1, 6] = 6) \land R6]]\} \lor
R7 := \{(xR8 = 98) \land [[(xR13[1, 6] = 7) \land xR14[0, 32]] \lor [(xR13[1, 6] = 7) \land R7]]\} \lor (xR13[1, 6] = 7) \land R7]\} \lor (xR13[1, 6] = 7) \land R7]\} \lor (xR13[1, 6] = 7) \land R7]\}
 R8 := \{(xR8 = 98) \land [[(xR13[1, 6] = 8) \land xR14[0, 32]] \lor [(xR13[1, 6] = 8) \land R8]]\} \lor \{(xR8 = 98) \land [(xR13[1, 6] = 8) \land R8]\}\} \lor \{(xR8 = 98) \land [(xR13[1, 6] = 8) \land R8]\}\}
 R9 := \{(xR8 = 98) \land [[(xR13[1, 6] = 9) \land xR14[0, 32]] \lor [(xR13[1, 6] = 9) \land R9]]\} \lor \{(xR13[1, 6] = 9) \land R9\}\}
 R10 := \{(xR8 = 98) \land [[(xR13[1, 6] = 10) \land xR14[0, 32]] \lor [(xR13[1, 6] = 10) \land R10]]\} \lor (xR13[1, 6] = 10) \land R10]\} \lor (xR13[1, 6] = 10) \land R10]\} \lor (xR13[1, 6] = 10) \land R10]\}
R11 := \{(xR8 = 98) \land [[(xR13[1,\ 6] = 11) \land xR14[0,\ 32]] \lor [(xR13[1,\ 6] = 11) \land R11]]\} \lor (xR13[1,\ 6] = 11) \land R11]\} \lor (xR13[1,\ 6] = 11) \land R11]\}
R12 := \{(xR8 = 98) \land [[(xR13[1, 6] = 12) \land xR14[0, 32]] \lor [(xR13[1, 6] = 12) \land R12]]\} \lor (xR13[1, 6] = 12) \land R12[]\} \lor (xR13[1, 6] = 12) \land R12[]
 R13 := \{(xR8 = 98) \land [[(xR13[1, 6] = 13) \land xR14[0, 32]] \lor [(xR13[1, 6] = 13) \land R13]]\} \lor (xR13[1, 6] = 13) \land R13[]\} \lor (xR13[1, 6] = 13) \land R13[]
R14 := \{(xR8 = 98) \land [[(xR13[1,\, 6] = 14) \land xR14[0,\, 32]] \lor [(xR13[1,\, 6] = 14) \land R14]]\} \lor (xR13[1,\, 6] = 14) \land R14]\} \lor (xR13[1,\, 6] = 14) \land R14]\}
 R15 := \{(xR8 = 98) \land [[(xR13[1, 6] = 15) \land xR14[0, 32]] \lor [(xR13[1, 6] = 15) \land R15]]\} \lor (xR13[1, 6] = 15) \land R15[]\} \lor (xR13[1, 6] = 15) \land R15[]
R16 := \{(xR8 = 98) \land [[(xR13[1,\, 6] = 16) \land xR14[0,\, 32]] \lor [(xR13[1,\, 6] = 16) \land R16]]\} \lor (xR13[1,\, 6] = 16) \land R16]\} \lor (xR13[1,\, 6] = 16) \land R16]\}
R17 := \{(xR8 = 98) \land [[(xR13[1, \, 6] = 17) \land xR14[0, \, 32]] \lor [(xR13[1, \, 6] = 17) \land R17]]\} \lor (xR13[1, \, 6] = 17) \land R17]]\} \lor (xR13[1, \, 6] = 17) \land R17]]\} \lor (xR13[1, \, 6] = 17) \land R17[]\} \lor (xR13[1, \, 6] = 17) \land R17[]\}
R18 := \{(xR8 = 98) \land [[(xR13[1, \, 6] = 18) \land xR14[0, \, 32]] \lor [(xR13[1, \, 6] = 18) \land R18]]\} \lor (xR13[1, \, 6] = 18) \land R18[]\} \lor (xR13[1, \, 6] = 18) \land R18[]\} \lor (xR13[1, \, 6] = 18) \land R18[]\}
R19 := \{(xR8 = 98) \land [[(xR13[1, 6] = 19) \land xR14[0, 32]] \lor [(xR13[1, 6] = 19) \land R19]]\} \lor (xR13[1, 6] = 19) \land R19]\} \lor (xR13[1, 6] = 19) \land R19[]\} \lor (xR13[1, 6] = 19) \land R19[]
R20 := \{(xR8 = 98) \land [[(xR13[1, 6] = 20) \land xR14[0, 32]] \lor [(xR13[1, 6] = 20) \land R20]]\} \lor (xR13[1, 6] = 20) \land R20]\} \lor (xR13[1, 6] = 20) \land R20]\} \lor (xR13[1, 6] = 20) \land R20]\} \lor (xR13[1, 6] = 20) \land R20]
R21 := \{(xR8 = 98) \land [[(xR13[1, 6] = 21) \land xR14[0, 32]] \lor [(xR13[1, 6] = 21) \land R21]]\} \lor (xR13[1, 6] = 21) \land R21]\} \lor (xR13[1, 6] = 21) \land R21[]\} \lor (xR13[1, 6] = 21) \land R21[]\}
R22 := \{(xR8 = 98) \land [[(xR13[1,\, 6] = 22) \land xR14[0,\, 32]] \lor [(xR13[1,\, 6] = 22) \land R22]]\} \lor (xR13[1,\, 6] = 22) \land R22]]
 R23 := \{(xR8 = 98) \land [[(xR13[1, 6] = 23) \land xR14[0, 32]] \lor [(xR13[1, 6] = 23) \land R23]]\} \lor [(xR13[1, 6] = 23) \land R23]]\} \lor [(xR13[1, 6] = 23) \land R23]\}
R24 := \{(xR8 = 98) \land [[(xR13[1, \, 6] = 24) \land xR14[0, \, 32]] \lor [(xR13[1, \, 6] = 24) \land R24]]\} \lor \{(xR13[1, \, 6] = 24) \land R24\}\}
 R25 := \{(xR8 = 98) \land [[(xR13[1, 6] = 25) \land xR14[0, 32]] \lor [(xR13[1, 6] = 25) \land R25]]\} \lor (xR13[1, 6] = 25) \land R25[]\} \lor (xR13[1, 6] = 25) \land R25[]
R26 := \{(xR8 = 98) \land [[(xR13[1, 6] = 26) \land xR14[0, 32]] \lor [(xR13[1, 6] = 26) \land R26]]\} \lor [(xR13[1, 6] = 26) \land R26]\} \lor [(xR13[1, 6] = 26) \land R26]\}
 R27 := \{(xR8 = 98) \land [[(xR13[1, 6] = 27) \land xR14[0, 32]] \lor [(xR13[1, 6] = 27) \land R27]]\} \lor
R28 := \{(xR8 = 98) \land [[(xR13[1,\, 6] = 28) \land xR14[0,\, 32]] \lor [(xR13[1,\, 6] = 28) \land R28]]\} \lor (xR13[1,\, 6] = 28) \land R28[]\} \lor (xR13[1,\, 6] = 28) \land R28[]
 R29 := \{(xR8 = 98) \land [[(xR13[1, 6] = 29) \land xR14[0, 32]] \lor [(xR13[1, 6] = 29) \land R29]]\} \lor (xR13[1, 6] = 29) \land R29]\} \lor (xR13[1, 6] = 29) \land R29[]\} \lor (xR13[1, 6] = 29) \land R29[]\}
R30 := \{(xR8 = 98) \land [[(xR13[1,\, 6] = 30) \land xR14[0,\, 32]] \lor [(xR13[1,\, 6] = 30) \land R30]]\} \lor [(xR13[1,\, 6] = 30) \land R30]]\} \lor [(xR13[1,\, 6] = 30) \land R30]\} \lor [(xR13[1,\, 6] = 30) \land R30]\}
R31 := \{(xR8 = 98) \land [[(xR13[1, 6] = 31) \land xR14[0, 32]] \lor [(xR13[1, 6] = 31) \land R31]]\} \lor [(xR13[1, 6] = 31) \land R31]\} \lor [(xR13[1, 6] = 31) \land R31]\}
 MEMORY[xR14[32, 64]] := \{(xR8 = 224) \land [(xR12[15, 23] = 59) \lor (xR12[15, 23] = 60)]\}
 \land (STACK\_MIN \ xR14[32, 64] \ STACK\_MAX) \land xR15[32, 64] \} \lor
MEMORY[xR12[32, 64]] := \{(xR8 = 224) \land [(xR12[15, 23] = 1) \lor (xR12[15, 23] = 10)]\}
  \land (MEM\_MIN \ xR12[32, 64] \ MEM\_MAX) \land xR13[32, 64] \} \lor
 MEMORY[xR14[32, 64]] := \{(xR8 = 224) \land (xR12[15, 23] = 52) \land (STACK\_MIN \ xR14[32, 64]) \}
STACK\_MAX) \wedge xR13[32, 64] \} \vee
THEOREM ANDN\_CORRECT \triangleq
```

```
ANDN[f][g][i] \equiv f[i] \land g[i]
PROOF
      \langle 1 \rangle 1 take f, g \in BVN
      \langle 1 \rangle 2 take i \in 0 \dots N
      \langle 1 \rangle 3 \ ANDN[f][g][i] \equiv f[i] \wedge g[i]
           BY DEF BVN, ANDN
     \langle 1 \rangle QED BY \langle 1 \rangle 3
THEOREM ORN\_CORRECT \triangleq
     \forall f, g \in BVN : \forall i \in 0 ... N :
      ORN[f][g][i] \equiv f[i] \vee g[i]
PROOF
      \langle 1 \rangle 1 Take f, g \in BVN
      \langle 1 \rangle 2 Take i \in 0 ... N
      \langle 1 \rangle 3 \ ORN[f][g][i] \equiv f[i] \vee g[i]
           BY DEF BVN, ORN
     \langle 1 \rangle QED BY \langle 1 \rangle 3
THEOREM EXPANDN\_CORRECT \triangleq
     \forall b \in \{\text{True, false}\} : \forall i \in 0 ... N :
      EXPANDN[b][i] \equiv b
PROOF
      \langle 1 \rangle 1 Take b \in \{\text{True, false}\}
      \langle 1 \rangle 2 Take i \in 0 ... N
      \langle 1 \rangle 3 \ EXPANDN[b][i] \equiv b
           BY DEF EXPANDN
     \langle 1 \rangle QED BY \langle 1 \rangle 3
THEOREM NOT\_XORN\_EQ \triangleq
     \forall f, g \in BVN : \forall i \in 0 ... N :
      \neg XORN[f][g][i] \equiv f[i] = g[i]
PROOF
      \langle 1 \rangle 1 Take f, g \in BVN
      \langle 1 \rangle 2 take i \in 0 ... N
      \langle 1 \rangle 3 Assume f[i] \neq g[i]Prove XORN[f][g][i]
            \langle 2 \rangle 1 f[i] \in \{\text{TRUE, FALSE}\}
                 BY DEF BVN
            \langle 2 \rangle 2 \ g[i] \in \{\text{TRUE, FALSE}\}
                 BY DEF BVN
            \langle 2 \rangle 3 \ (f[i] \neq g[i]) \Rightarrow ((f[i] \land \neg g[i]) \lor (\neg f[i] \land g[i]))
                  BY \langle 2 \rangle 1, \langle 2 \rangle 2
            \langle 2 \rangle 4 ((f[i] \land \neg g[i]) \lor (\neg f[i] \land g[i]))
                 BY \langle 1 \rangle 3, \langle 2 \rangle 3
            \langle 2 \rangle 5 \ XORN[f][g][i]
                 BY \langle 2 \rangle 4 DEF XORN
```

 $\forall f, g \in BVN : \forall i \in 0 ... N :$

```
\langle 2 \rangle 6 QED BY \langle 2 \rangle 5
                    \langle 1 \rangle 4 Assume XORN[f][g][i]PROVE (f[i] \neq g[i])
                                          \langle 2 \rangle 7 \left( (f[i] \wedge \neg g[i]) \vee (\neg f[i] \wedge g[i]) \right)
                                                              BY \langle 1 \rangle 4 DEF XORN
                                          \langle 2 \rangle 8 f[i] \neq g[i]
                                                              BY \langle 2 \rangle 7
                                          \langle 2 \rangle 9 QED BY \langle 2 \rangle 8
                    \langle 1 \rangle QED BY \langle 1 \rangle 3, \langle 1 \rangle 4
THEOREM CMP32\_F\_EQ\_G \stackrel{\triangle}{=}
                     Assume N = 31Prove
                    \forall f, g \in BVN:
                     CMP32[f][g] \equiv f = g
PROOF
                     \langle 1 \rangle 1 Take f, g \in BVN
                     \langle 1 \rangle 2 assume CMP32[f][g]Prove f = g
                                          \langle 2 \rangle 1
                                                                  (\neg XORN[f][g][0] \land \neg XORN[f][g][1] \land \neg XORN[f][g][2] \land
                                                                   \neg XORN[f][g][3] \land \neg XORN[f][g][4] \land \neg XORN[f][g][5] \land
                                                                  \neg XORN[f][g][6] \land \neg XORN[f][g][7] \land \neg XORN[f][g][8] \land
                                                                  \neg XORN[f][g][9] \land \neg XORN[f][g][10] \land \neg XORN[f][g][11] \land
                                                                   \neg XORN[f][g][12] \land \neg XORN[f][g][13] \land \neg XORN[f][g][14] \land
                                                                  \neg XORN[f][g][15] \land \neg XORN[f][g][16] \land \neg XORN[f][g][17] \land
                                                                  \neg XORN[f][g][18] \land \neg XORN[f][g][19] \land \neg XORN[f][g][20] \land
                                                                  \neg XORN[f][g][21] \land \neg XORN[f][g][22] \land \neg XORN[f][g][23] \land
                                                                  \neg XORN[f][g][24] \land \neg XORN[f][g][25] \land \neg XORN[f][g][26] \land
                                                                  \neg XORN[f][g][27] \land \neg XORN[f][g][28] \land \neg XORN[f][g][29] \land
                                                                   \neg XORN[f][g][30] \land \neg XORN[f][g][31]) \Rightarrow
                                                                  (f[0] = g[0] \land f[1] = g[1] \land f[2] = g[2]
                                                                                                                                                                                                                                                                                                                \wedge f[3] = g[3] \wedge
                                                                                                                                                                                                                           \wedge f[6] = g[6]
                                                                                                                                                                                                                                                                                                         \wedge f[7] = g[7]
                                                                      f[4] = g[4]
                                                                                                                                           \land f[5] = g[5]
                                                                       f[8] = g[8]
                                                                                                                                           \wedge f[9] = g[9]
                                                                                                                                                                                                                           \wedge f[10] = g[10] \wedge f[11] = g[11] \wedge
                                                                       f[12] = g[12] \wedge f[13] = g[13] \wedge f[14] = g[14] \wedge f[15] = g[15] \wedge f[16] = g[16] \wedge f[16] \wedge f[16] \wedge f[16] = g[16] \wedge f[16] \wedge f[16] \wedge f[16] = g[16] \wedge f[16] \wedge f[16
                                                                       f[16] = g[16] \land f[17] = g[17] \land f[18] = g[18] \land f[19] = g[19] \land
                                                                       f[20] = g[20] \land f[21] = g[21] \land f[22] = g[22] \land f[23] = g[23] \land f[20] = g[20] \land f[20] = g[20
                                                                       f[24] = g[24] \wedge f[25] = g[25] \wedge f[26] = g[26] \wedge f[27] = g[27] \wedge
                                                                      f[28] = g[28] \land f[29] = g[29] \land f[30] = g[30] \land f[31] = g[31]
                                                                  BY NOT\_XORN\_EQ
                                          \langle 2 \rangle 2
                                                                                                                                                                                                                               \wedge f[2] = g[2]
                                                                  (f[0] = g[0]
                                                                                                                                            \wedge f[1] = g[1]
                                                                                                                                                                                                                                                                                                                 \wedge f[3] = g[3]
                                                                       f[4] = g[4]
                                                                                                                                            \wedge f[5] = g[5]
                                                                                                                                                                                                                               \land f[6] = g[6] \quad \land f[7] = g[7]
                                                                                                                                       \wedge f[9] = g[9]
                                                                                                                                                                                                                           \wedge f[10] = g[10] \wedge f[11] = g[11] \wedge
                                                                       f[8] = g[8]
                                                                       f[12] = g[12] \land f[13] = g[13] \land f[14] = g[14] \land f[15] = g[15] \land
                                                                       f[16] = g[16] \land f[17] = g[17] \land f[18] = g[18] \land f[19] = g[19] \land
                                                                       f[20] = g[20] \wedge f[21] = g[21] \wedge f[22] = g[22] \wedge f[23] = g[23] \wedge f[20] = g[20] \wedge f[20] = g[20
                                                                       f[24] = g[24] \land f[25] = g[25] \land f[26] = g[26] \land f[27] = g[27] \land
```

```
f[28] = g[28] \wedge f[29] = g[29] \wedge f[30] = g[30] \wedge f[31] = g[31]) \Rightarrow
                                                  (f=g)
                                        BY DEF BVN
                     \langle 2 \rangle 3 f = g
                                         BY \langle 1 \rangle 2, \langle 2 \rangle 1, \langle 2 \rangle 2 DEF CMP32
                     \langle 2 \rangle 4 QED BY \langle 2 \rangle 3
\langle 1 \rangle 3 Assume f = gProve CMP32[f][g]
                    \langle 2 \rangle 5 \ (f = g) \Rightarrow
                                               (f[0] = q[0])
                                                                                                                         \wedge f[1] = g[1] \quad \wedge f[2] = g[2]
                                                                                                                                                                                                                                                                                             \wedge f[3] = q[3]
                                                  f[4] = g[4]
                                                                                                                          \wedge f[5] = g[5]
                                                                                                                                                                                                         \wedge f[6] = g[6] \quad \wedge f[7] = g[7]
                                                                                                                    \wedge f[9] = g[9] \quad \wedge f[10] = g[10] \wedge f[11] = g[11] \wedge f[11] = g[
                                                  f[8] = g[8]
                                                  f[12] = g[12] \wedge f[13] = g[13] \wedge f[14] = g[14] \wedge f[15] = g[15] \wedge f[16] = g[16] \wedge f[16] \wedge f[16] \wedge f[16] = g[16] \wedge f[16] \wedge f[16] \wedge f[16] = g[16] \wedge f[16] \wedge f[16
                                                  f[16] = g[16] \land f[17] = g[17] \land f[18] = g[18] \land f[19] = g[19] \land f[19] \land f[19] = g[19] \land f[19] \land f[19] = g[19
                                                  f[20] = q[20] \land f[21] = q[21] \land f[22] = q[22] \land f[23] = q[23] \land
                                                  f[24] = g[24] \land f[25] = g[25] \land f[26] = g[26] \land f[27] = g[27] \land
                                                  f[28] = g[28] \land f[29] = g[29] \land f[30] = g[30] \land f[31] = g[31]
                                         OBVIOUS
                     \langle 2 \rangle 6
                                               (f[0] = g[0]
                                                                                                                         \wedge f[1] = g[1]
                                                                                                                                                                                                         \wedge f[2] = g[2]
                                                                                                                                                                                                                                                                                       \wedge f[3] = g[3] \wedge
                                                                                                                                                                                                          \wedge f[6] = g[6]
                                                                                                                                                                                                                                                                                             \wedge f[7] = g[7]
                                                                                                                        \wedge f[5] = g[5]
                                                  f[4] = g[4]
                                                  f[8] = g[8]
                                                                                                                      \wedge f[9] = g[9]
                                                                                                                                                                                                        \land f[10] = g[10] \land f[11] = g[11] \land
                                                  f[12] = g[12] \land f[13] = g[13] \land f[14] = g[14] \land f[15] = g[15] \land
                                                  f[16] = g[16] \land f[17] = g[17] \land f[18] = g[18] \land f[19] = g[19] \land
                                                  f[20] = g[20] \land f[21] = g[21] \land f[22] = g[22] \land f[23] = g[23] \land
                                                  f[24] = g[24] \wedge f[25] = g[25] \wedge f[26] = g[26] \wedge f[27] = g[27] \wedge
                                                 f[28] = g[28] \land f[29] = g[29] \land f[30] = g[30] \land f[31] = g[31]) \Rightarrow
                                               (\neg XORN[f][g][0] \land \neg XORN[f][g][1] \land \neg XORN[f][g][2] \land
                                              \neg XORN[f][g][3] \land \neg XORN[f][g][4] \land \neg XORN[f][g][5] \land
                                              \neg XORN[f][g][6] \land \neg XORN[f][g][7] \land \neg XORN[f][g][8] \land
                                              \neg XORN[f][g][9] \land \neg XORN[f][g][10] \land \neg XORN[f][g][11] \land
                                               \neg XORN[f][g][12] \land \neg XORN[f][g][13] \land \neg XORN[f][g][14] \land
                                              \neg XORN[f][g][15] \land \neg XORN[f][g][16] \land \neg XORN[f][g][17] \land
                                              \neg XORN[f][g][18] \land \neg XORN[f][g][19] \land \neg XORN[f][g][20] \land
                                               \neg XORN[f][g][21] \land \neg XORN[f][g][22] \land \neg XORN[f][g][23] \land
                                               \neg XORN[f][g][24] \land \neg XORN[f][g][25] \land \neg XORN[f][g][26] \land
                                              \neg XORN[f][g][27] \land \neg XORN[f][g][28] \land \neg XORN[f][g][29] \land
                                              \neg XORN[f][g][30] \land \neg XORN[f][g][31]
                                         BY NOT\_XORN\_EQ
                     \langle 2 \rangle 7 \ CMP32[f][g]
                                         BY \langle 1 \rangle 3, \langle 2 \rangle 5, \langle 2 \rangle 6 DEF CMP32
                     \langle 2 \rangle 8 QED BY \langle 2 \rangle 7
\langle 1 \rangle QED BY \langle 1 \rangle 2, \langle 1 \rangle 3
```

```
THEOREM CMP64\_F\_EQ\_G \triangleq
              Assume N = 63Prove
             \forall f, g \in BVN:
              CMP64[f][g] \equiv f = g
PROOF
              \langle 1 \rangle 1 Take f, g \in BVN
              \langle 1 \rangle 2 assume CMP64[f][g]Prove f = g
                           \langle 2 \rangle 1
                                            (\neg XORN[f][g][0] \land \neg XORN[f][g][1] \land \neg XORN[f][g][2] \land
                                              \neg XORN[f][g][3] \land \neg XORN[f][g][4] \land \neg XORN[f][g][5] \land
                                              \neg XORN[f][g][6] \land \neg XORN[f][g][7] \land \neg XORN[f][g][8] \land
                                              \neg XORN[f][g][9] \land \neg XORN[f][g][10] \land \neg XORN[f][g][11] \land
                                              \neg XORN[f][g][12] \land \neg XORN[f][g][13] \land \neg XORN[f][g][14] \land
                                              \neg XORN[f][g][15] \land \neg XORN[f][g][16] \land \neg XORN[f][g][17] \land
                                              \neg XORN[f][g][18] \land \neg XORN[f][g][19] \land \neg XORN[f][g][20] \land
                                              \neg XORN[f][g][21] \land \neg XORN[f][g][22] \land \neg XORN[f][g][23] \land
                                              \neg XORN[f][g][24] \land \neg XORN[f][g][25] \land \neg XORN[f][g][26] \land
                                              \neg XORN[f][g][27] \land \neg XORN[f][g][28] \land \neg XORN[f][g][29] \land
                                              \neg XORN[f][g][30] \land \neg XORN[f][g][31] \land
                                              \neg XORN[f][g][32] \land \neg XORN[f][g][33] \land \neg XORN[f][g][34] \land
                                              \neg XORN[f][g][35] \land \neg XORN[f][g][36] \land \neg XORN[f][g][37] \land
                                              \neg XORN[f][g][38] \land \neg XORN[f][g][39] \land \neg XORN[f][g][40] \land
                                              \neg XORN[f][g][41] \land \neg XORN[f][g][42] \land \neg XORN[f][g][43] \land
                                              \neg XORN[f][g][44] \land \neg XORN[f][g][45] \land \neg XORN[f][g][46] \land
                                              \neg XORN[f][g][47] \land \neg XORN[f][g][48] \land \neg XORN[f][g][49] \land
                                              \neg XORN[f][g][50] \land \neg XORN[f][g][51] \land \neg XORN[f][g][52] \land
                                              \neg XORN[f][g][53] \land \neg XORN[f][g][54] \land \neg XORN[f][g][55] \land
                                              \neg XORN[f][g][56] \land \neg XORN[f][g][57] \land \neg XORN[f][g][58] \land
                                              \neg XORN[f][g][59] \land \neg XORN[f][g][60] \land \neg XORN[f][g][61] \land
                                               \neg XORN[f][g][62] \land \neg XORN[f][g][63]) \Rightarrow
                                            (f[0] = g[0]
                                                                                         \wedge f[1] = g[1] \quad \wedge f[2] = g[2]
                                                                                                                                                                                                        \wedge f[3] = q[3]
                                              f[4] = g[4]
                                                                                            \wedge f[5] = g[5]
                                                                                                                                                 \wedge f[6] = g[6]
                                                                                                                                                                                                      \wedge f[7] = g[7]
                                              f[8] = q[8]
                                                                                            \wedge f[9] = g[9]
                                                                                                                                              \wedge f[10] = g[10] \wedge f[11] = g[11] \wedge
                                              f[12] = g[12] \land f[13] = g[13] \land f[14] = g[14] \land f[15] = g[15] \land
                                              f[16] = g[16] \land f[17] = g[17] \land f[18] = g[18] \land f[19] = g[19] \land
                                              f[20] = g[20] \land f[21] = g[21] \land f[22] = g[22] \land f[23] = g[23] \land
                                              f[24] = g[24] \land f[25] = g[25] \land f[26] = g[26] \land f[27] = g[27] \land
                                              f[28] = g[28] \wedge f[29] = g[29] \wedge f[30] = g[30] \wedge f[31] = g[31] \wedge f[39] = g[39] \wedge f[39] = g[39
                                              f[32] = g[32] \wedge f[33] = g[33] \wedge f[34] = g[34] \wedge f[35] = g[35] \wedge
                                              f[36] = g[36] \land f[37] = g[37] \land f[38] = g[38] \land f[39] = g[39] \land
                                              f[40] = g[40] \wedge f[41] = g[41] \wedge f[42] = g[42] \wedge f[43] = g[43] \wedge f[40] = g[40] \wedge f[40] = g[40
                                              f[44] = g[44] \land f[45] = g[45] \land f[46] = g[46] \land f[47] = g[47] \land
                                              f[48] = g[48] \wedge f[49] = g[49] \wedge f[50] = g[50] \wedge f[51] = g[51] \wedge
                                              f[52] = g[52] \land f[53] = g[53] \land f[54] = g[54] \land f[55] = g[55] \land
                                              f[56] = g[56] \land f[57] = g[57] \land f[58] = g[58] \land f[59] = g[59] \land
```

```
f[60] = g[60] \land f[61] = g[61] \land f[62] = g[62] \land f[63] = g[63]
                                                                              BY NOT\_XORN\_EQ
                                   \langle 2 \rangle 2
                                                                               (f[0] = g[0])
                                                                                                                                                                                                                                                                                                                                                              \wedge f[2] = g[2]
                                                                                                                                                                                                                \wedge f[1] = g[1]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \wedge f[3] = g[3]
                                                                                      f[4] = g[4]
                                                                                                                                                                                                                \wedge f[5] = g[5]
                                                                                                                                                                                                                                                                                                                                                              \wedge f[6] = g[6]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \wedge f[7] = g[7]
                                                                                                                                                                                                                \wedge f[9] = g[9]
                                                                                                                                                                                                                                                                                                                                                              \wedge f[10] = g[10] \wedge f[11] = g[11] \wedge
                                                                                      f[8] = g[8]
                                                                                      f[12] = g[12] \wedge f[13] = g[13] \wedge f[14] = g[14] \wedge f[15] = g[15] \wedge f[16] = g[16] \wedge f[16] \wedge f[16] \wedge f[16] = g[16] \wedge f[16] \wedge f[16] \wedge f[16] = g[16] \wedge f[16] \wedge f[16
                                                                                      f[16] = g[16] \land f[17] = g[17] \land f[18] = g[18] \land f[19] = g[19] \land
                                                                                      f[20] = g[20] \land f[21] = g[21] \land f[22] = g[22] \land f[23] = g[23] \land
                                                                                      f[24] = g[24] \wedge f[25] = g[25] \wedge f[26] = g[26] \wedge f[27] = g[27] \wedge
                                                                                      f[28] = g[28] \land f[29] = g[29] \land f[30] = g[30] \land f[31] = g[31] \land
                                                                                      f[32] = g[32] \wedge f[33] = g[33] \wedge f[34] = g[34] \wedge f[35] = g[35] \wedge f[36] = g[36] \wedge f[36] = g[36
                                                                                      f[36] = g[36] \land f[37] = g[37] \land f[38] = g[38] \land f[39] = g[39] \land f[39] = g[39
                                                                                      f[40] = q[40] \land f[41] = q[41] \land f[42] = q[42] \land f[43] = q[43] \land
                                                                                      f[44] = g[44] \wedge f[45] = g[45] \wedge f[46] = g[46] \wedge f[47] = g[47] \wedge
                                                                                      f[48] = q[48] \land f[49] = q[49] \land f[50] = q[50] \land f[51] = q[51] \land
                                                                                      f[52] = g[52] \land f[53] = g[53] \land f[54] = g[54] \land f[55] = g[55] \land
                                                                                      f[56] = g[56] \land f[57] = g[57] \land f[58] = g[58] \land f[59] = g[59] \land
                                                                                      f[60] = g[60] \land f[61] = g[61] \land f[62] = g[62] \land f[63] = g[63]) \Rightarrow
                                                                                      (f=g)
                                                                      By Def BVN
                                   \langle 2 \rangle 3 f = g
                                                                      BY \langle 1 \rangle 2, \langle 2 \rangle 1, \langle 2 \rangle 2 DEF CMP64
                                   \langle 2 \rangle 4 QED BY \langle 2 \rangle 3
\langle 1 \rangle 3 Assume f = gProve CMP64[f][g]
                                   \langle 2 \rangle 5 \ (f = q) \Rightarrow
                                                                               (f[0] = g[0]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \wedge f[3] = g[3]
                                                                                                                                                                                                                \wedge f[1] = g[1]
                                                                                                                                                                                                                                                                                                                                                                \wedge f[2] = g[2]
                                                                                                                                                                                                                                                                                                                                                                \wedge f[6] = g[6]
                                                                                      f[4] = g[4]
                                                                                                                                                                                                                \wedge f[5] = g[5]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \wedge f[7] = g[7]
                                                                                      f[8] = g[8]
                                                                                                                                                                                                               \wedge f[9] = g[9]
                                                                                                                                                                                                                                                                                                                                                      \wedge f[10] = g[10] \wedge f[11] = g[11] \wedge
                                                                                      f[12] = g[12] \land f[13] = g[13] \land f[14] = g[14] \land f[15] = g[15] \land f[16] = g[16] \land f[16] \land f[16
                                                                                      f[16] = q[16] \land f[17] = q[17] \land f[18] = q[18] \land f[19] = q[19] \land
                                                                                      f[20] = g[20] \land f[21] = g[21] \land f[22] = g[22] \land f[23] = g[23] \land
                                                                                      f[24] = q[24] \land f[25] = q[25] \land f[26] = q[26] \land f[27] = q[27] \land
                                                                                      f[28] = g[28] \land f[29] = g[29] \land f[30] = g[30] \land f[31] = g[31] \land f[30] = g[30] \land f[30] = g[30
                                                                                      f[32] = g[32] \wedge f[33] = g[33] \wedge f[34] = g[34] \wedge f[35] = g[35] \wedge f[36] = g[36] \wedge f[36] = g[36
                                                                                      f[36] = g[36] \wedge f[37] = g[37] \wedge f[38] = g[38] \wedge f[39] = g[39] \wedge f[38] = g[38] \wedge f[39] = g[39] \wedge f[38] = g[38] \wedge f[39] = g[39] \wedge f[39] = g[39
                                                                                      f[40] = g[40] \wedge f[41] = g[41] \wedge f[42] = g[42] \wedge f[43] = g[43] \wedge
                                                                                      f[44] = g[44] \wedge f[45] = g[45] \wedge f[46] = g[46] \wedge f[47] = g[47] \wedge
                                                                                      f[48] = g[48] \land f[49] = g[49] \land f[50] = g[50] \land f[51] = g[51] \land
                                                                                      f[52] = g[52] \land f[53] = g[53] \land f[54] = g[54] \land f[55] = g[55] \land
                                                                                      f[56] = g[56] \land f[57] = g[57] \land f[58] = g[58] \land f[59] = g[59] \land
                                                                                      f[60] = g[60] \land f[61] = g[61] \land f[62] = g[62] \land f[63] = g[63]
                                                                      OBVIOUS
                                   \langle 2 \rangle 6
                                                                              (f[0] = g[0] \land f[1] = g[1] \land f[2] = g[2] \land f[3] = g[3] \land
```

```
f[4] = g[4]
                                                                              \wedge f[5] = g[5]
                                                                                                                                   \wedge f[6] = g[6] \quad \wedge f[7] = g[7] \quad \wedge
                                                                              \wedge f[9] = g[9]
                                                                                                                                     \wedge f[10] = g[10] \wedge f[11] = g[11] \wedge
                                 f[8] = g[8]
                                 f[12] = g[12] \wedge f[13] = g[13] \wedge f[14] = g[14] \wedge f[15] = g[15] \wedge
                                 f[16] = g[16] \land f[17] = g[17] \land f[18] = g[18] \land f[19] = g[19] \land
                                 f[20] = g[20] \land f[21] = g[21] \land f[22] = g[22] \land f[23] = g[23] \land
                                 f[24] = g[24] \land f[25] = g[25] \land f[26] = g[26] \land f[27] = g[27] \land
                                 f[28] = g[28] \land f[29] = g[29] \land f[30] = g[30] \land f[31] = g[31] \land
                                 f[32] = g[32] \wedge f[33] = g[33] \wedge f[34] = g[34] \wedge f[35] = g[35] \wedge f[36] = g[36] \wedge f[36] = g[36
                                 f[36] = g[36] \land f[37] = g[37] \land f[38] = g[38] \land f[39] = g[39] \land
                                 f[40] = g[40] \wedge f[41] = g[41] \wedge f[42] = g[42] \wedge f[43] = g[43] \wedge
                                 f[44] = g[44] \land f[45] = g[45] \land f[46] = g[46] \land f[47] = g[47] \land
                                 f[48] = g[48] \wedge f[49] = g[49] \wedge f[50] = g[50] \wedge f[51] = g[51] \wedge f[48] = g[48] \wedge f[48] = g[48
                                 f[52] = g[52] \land f[53] = g[53] \land f[54] = g[54] \land f[55] = g[55] \land
                                 f[56] = q[56] \land f[57] = q[57] \land f[58] = q[58] \land f[59] = q[59] \land
                                 f[60] = g[60] \land f[61] = g[61] \land f[62] = g[62] \land f[63] = g[63]) \Rightarrow
                               (\neg XORN[f][g][0] \land \neg XORN[f][g][1] \land \neg XORN[f][g][2] \land
                                 \neg XORN[f][g][3] \land \neg XORN[f][g][4] \land \neg XORN[f][g][5] \land
                                 \neg XORN[f][g][6] \land \neg XORN[f][g][7] \land \neg XORN[f][g][8] \land
                                 \neg XORN[f][g][9] \land \neg XORN[f][g][10] \land \neg XORN[f][g][11] \land
                                 \neg XORN[f][g][12] \land \neg XORN[f][g][13] \land \neg XORN[f][g][14] \land
                                 \neg XORN[f][g][15] \land \neg XORN[f][g][16] \land \neg XORN[f][g][17] \land
                                 \neg XORN[f][g][18] \land \neg XORN[f][g][19] \land \neg XORN[f][g][20] \land
                                 \neg XORN[f][g][21] \land \neg XORN[f][g][22] \land \neg XORN[f][g][23] \land
                                 \neg XORN[f][g][24] \land \neg XORN[f][g][25] \land \neg XORN[f][g][26] \land
                                 \neg XORN[f][g][27] \land \neg XORN[f][g][28] \land \neg XORN[f][g][29] \land
                                 \neg XORN[f][g][30] \land \neg XORN[f][g][31] \land
                                 \neg XORN[f][g][32] \land \neg XORN[f][g][33] \land \neg XORN[f][g][34] \land
                                 \neg XORN[f][g][35] \land \neg XORN[f][g][36] \land \neg XORN[f][g][37] \land
                                 \neg XORN[f][g][38] \land \neg XORN[f][g][39] \land \neg XORN[f][g][40] \land
                                 \neg XORN[f][g][41] \land \neg XORN[f][g][42] \land \neg XORN[f][g][43] \land
                                 \neg XORN[f][g][44] \land \neg XORN[f][g][45] \land \neg XORN[f][g][46] \land
                                 \neg XORN[f][g][47] \land \neg XORN[f][g][48] \land \neg XORN[f][g][49] \land
                                 \neg XORN[f][g][50] \land \neg XORN[f][g][51] \land \neg XORN[f][g][52] \land
                                 \neg XORN[f][g][53] \land \neg XORN[f][g][54] \land \neg XORN[f][g][55] \land
                                 \neg XORN[f][g][56] \land \neg XORN[f][g][57] \land \neg XORN[f][g][58] \land
                                 \neg XORN[f][g][59] \land \neg XORN[f][g][60] \land \neg XORN[f][g][61] \land
                                 \neg XORN[f][g][62] \land \neg XORN[f][g][63]
                          BY NOT\_XORN\_EQ
             \langle 2 \rangle 7 \ CMP64[f][g]
                          BY \langle 1 \rangle 3, \langle 2 \rangle 5, \langle 2 \rangle 6 DEF CMP64
             \langle 2 \rangle 8 QED BY \langle 2 \rangle 7
\langle 1 \rangle QED BY \langle 1 \rangle 2, \langle 1 \rangle 3
```

- $\backslash \ * \ \operatorname{Modification} \ \operatorname{History}$
- \ * Last modified Mon Dec 19 12:12:02 CST 2022 by mjhomefolder
- \backslash * Created Thu Nov 03 00:11:52 CDT 2022 by mjhomefolder