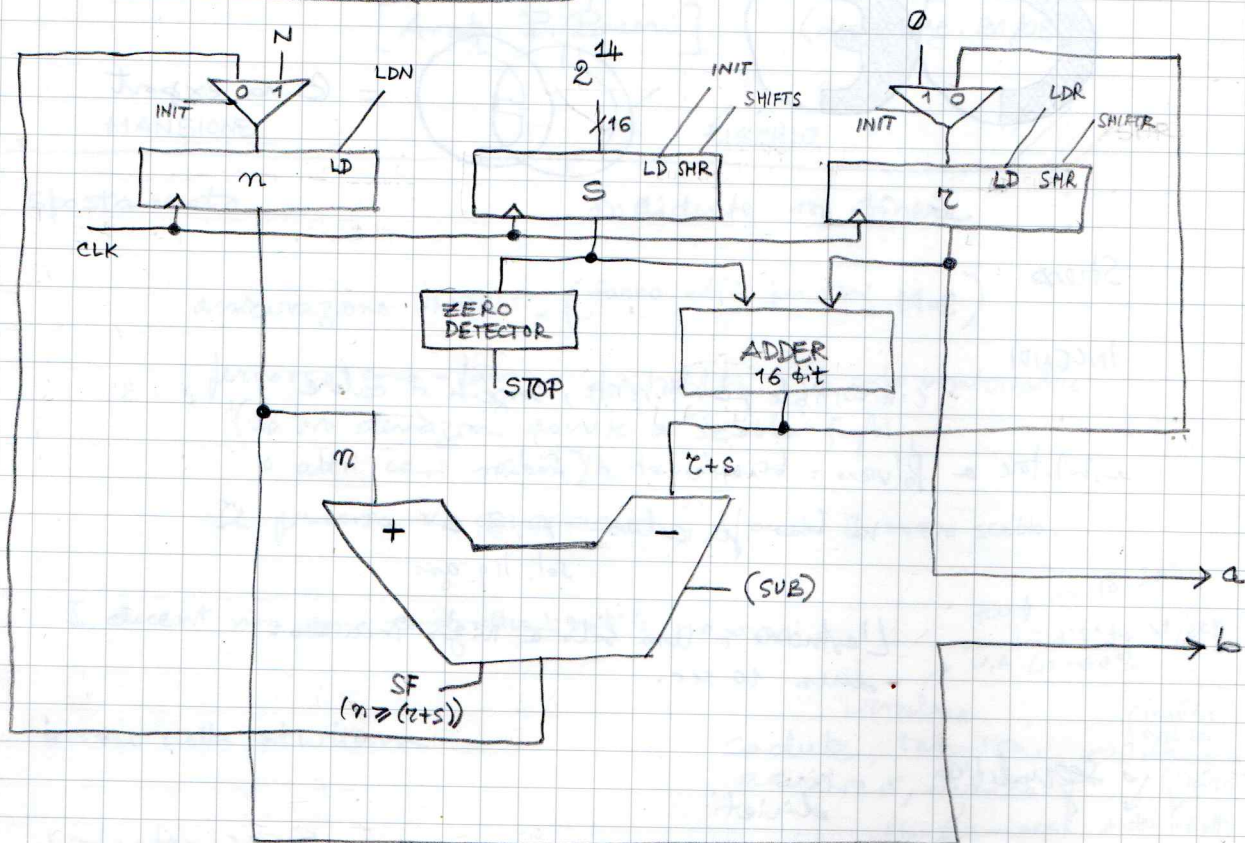


23/6/19

compito 17 giugno 2019

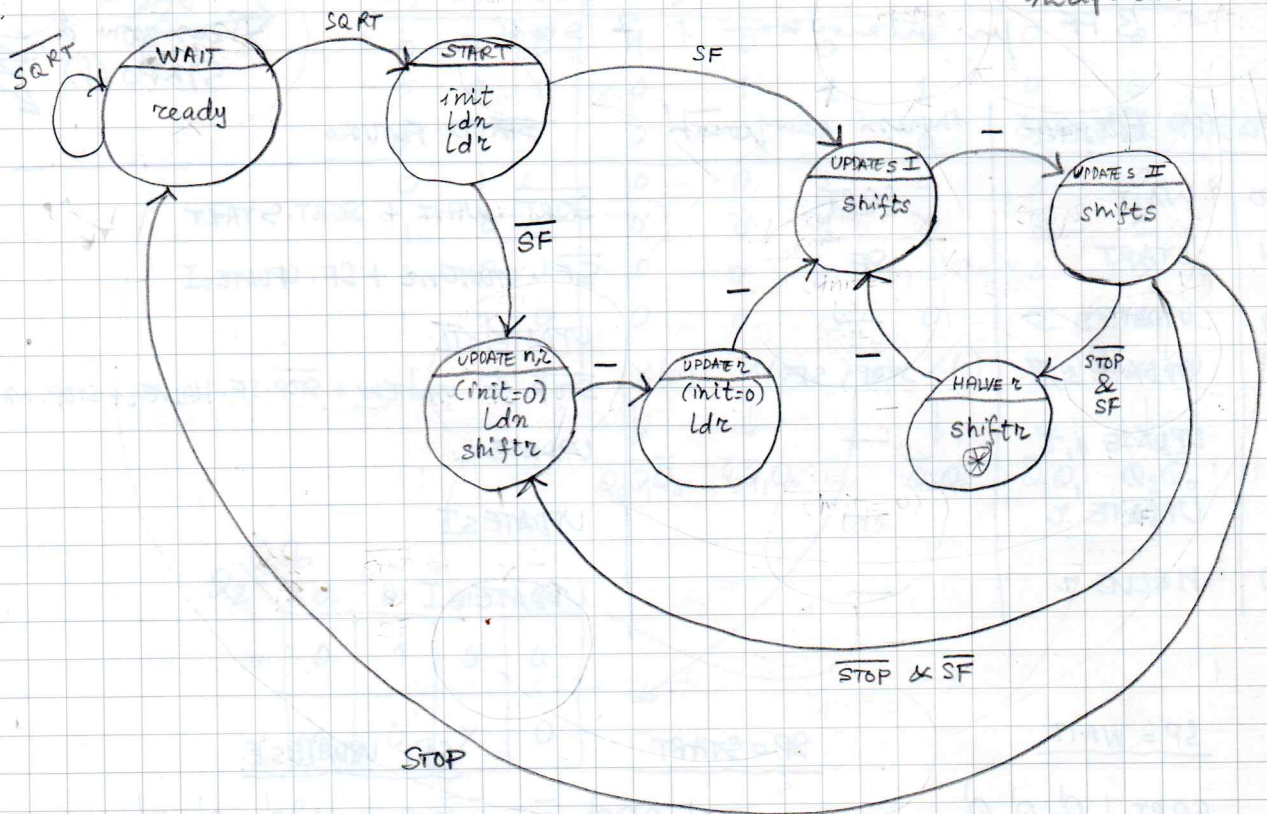
NOTE

- ① Dopo l'inizializzazione ( $n \leftarrow N, z \leftarrow 0, s \leftarrow 2^{14}$ ), durante la fase di aggiustamento di  $s$  (ciclo while "adjust") la condizione  $s > n$  si può riscrivere come  $n - (z+s) < 0$ , perché  $z = 0$ . Si esce da questa condizione se  $SF = 0 \Leftrightarrow n - (z+s) \geq 0$ .
- ② Durante la fase di calcolo ("compute/update"), dopo l'eventuale aggiornamento di  $n$ ,  $z$  va comunque shiftata a destra di 1. Il nuovo valore di  $z$  si troverà già all'interno del registro se  $SF = 1$ , mentre dovrà essere caricato dall'esterno se  $SF = 0$ .
- ③ Lo ZERO DETECTOR è una semplice porta NOR con ingresso  $s$ :  

$$STOP = \overline{s_{15}} \cdot \overline{s_{14}} \cdot \overline{s_{13}} \cdots \overline{s_2} \cdot \overline{s_1} \cdot \overline{s_0} = \overline{s_{15} + s_{14} + s_{13} + \dots + s_2 + s_1 + s_0}$$

$$2^{14} = (0100000000000000)_2 \text{ costante di inizializzazione di } s.$$

\* durante l'adjuste  
 $r=0$  e il suo  
 drive  $Hz$  m. è  
 influenzante -



- ④ Nella realizzazione del controllo più sopra, ciascuna iterazione della fase di "adjust" richiede tre stati\* (shifts, shifts, shiftr) anziché due (shifts, shifts), perché in questo modo i tre stati possono essere utilizzati tali e quali nelle fasi "compute/update" successive. In alternativa, i due stati di adjust dovrebbero essere diversi da quelli di compute/update, con un incremento totale di due stati (9, anziché 7). \* Con  $z \gg 1 = 0$ , perché  $z = 0$ .

- ⑤ Si ipotizza che l'aggiornamento di  $n$  ( $n \leftarrow n - (z+s)$ ) avvenga sul fronte del clock, dunque con riferimento da non usare del "contemporaneo" (come nello stesso stato) aggiornamento globale di  $z$  ( $z \gg 1$ ). In questo modo, si evita di usare uno stato in più, che sarebbe necessario per  $z \leftarrow (z \gg 1) + s$  perché shiftr e ldr sono mutuamente esclusivi.



# Sintesi con registro di stato e multiplexer

3 FF per memorizzare i 7 stati.

Funzione di Transizione di Stato (f)

| Codice Stato PRESENTE     | Ingressi componenti | STATO FUTURO                                                                                                                                                                  |
|---------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 000 WAIT                  | SQRT                | $\overline{\text{SQRT}} \cdot \text{WAIT} + \text{SQRT} \cdot \text{START}$                                                                                                   |
| 001 START                 | SF                  | $\overline{\text{SF}} \cdot \text{UPDATE}_{n2} + \text{SF} \cdot \text{UPDATE}_{sI}$                                                                                          |
| 010 UPDATE <sub>sI</sub>  | —                   | UPDATE <sub>sII</sub>                                                                                                                                                         |
| 011 UPDATE <sub>sII</sub> | STOP, SF            | $\overline{\text{STOP}} \cdot \overline{\text{SF}} \cdot \text{UPDATE}_{n2} + \overline{\text{STOP}} \cdot \text{SF} \cdot \text{HALVE}_{n2} + \text{STOP} \cdot \text{WAIT}$ |
| 100 UPDATE <sub>n2</sub>  | —                   | UPDATE <sub>n2</sub>                                                                                                                                                          |
| 101 UPDATE <sub>n2</sub>  | —                   | UPDATE <sub>sI</sub>                                                                                                                                                          |
| 110 HALVE <sub>n2</sub>   | —                   | UPDATE <sub>sI</sub>                                                                                                                                                          |

SP = WAIT

| SQRT | $Q_2' Q_1' Q_0'$ |
|------|------------------|
| 0    | 0 0 0            |
| 1    | 0 0 1            |
|      | ↓ ↓ ↓            |
|      | 0 0 SQRT         |

SP = START

| SF | $Q_2' Q_1' Q_0'$ |
|----|------------------|
| 0  | 1 0 0            |
| 1  | 0 1 0            |
|    | ↓ ↓ ↓            |
|    | SF SF 0          |

SP = UPDATE<sub>sI</sub>

| STOP SF | $Q_2' Q_1' Q_0'$ |
|---------|------------------|
| 0 0     | 1 0 0            |
| 0 1     | 1 1 0            |
| 1 0     | 0 0 0            |
| 1 1     | 0 0 0            |
|         | ↓ ↓ ↓            |
|         | STOP STOP · SF   |

SP = UPDATE<sub>sI</sub>

$$Q_2' Q_1' Q_0' = 011$$

SP = UPDATE<sub>n2</sub>

$$Q_2' Q_1' Q_0' = 010$$

SP = UPDATE<sub>n2</sub>

$$Q_2' Q_1' Q_0' = 101$$

SP = HALVE<sub>n2</sub>

$$Q_2' Q_1' Q_0' = 010$$

Funzione d'uscita (g)

| $Q_2$ | $Q_1$ | $Q_0$ | Ready | init | ldn  | ldz  | shifts | shiftr |
|-------|-------|-------|-------|------|------|------|--------|--------|
| 0     | 0     | 0     | 1     | 0    | 0    | 0    | 0      | 0      |
| 0     | 0     | 1     | 0     | 1    | 1    | 1    | 0      | 0      |
| 0     | 1     | 0     | 0     | 0    | 0    | 0    | 1      | 0      |
| 0     | 1     | 1     | 0     | 0    | 0    | 0    | 1      | 0      |
| 1     | 0     | 0     | 0     | 0    | 1    | 0    | 0      | 1      |
| 1     | 0     | 1     | 0     | 0    | 0    | 1    | 0      | 0      |
| 1     | 1     | 0     | 0     | 0    | 0    | 0    | 0      | 1      |
| 1     | 1     | 1     | X(0)  | X(0) | X(0) | X(0) | X(0)   | X(0)   |

$$\downarrow$$

$$\overline{Q_2} \overline{Q_1} \overline{Q_0}$$

$$\downarrow$$

$$\overline{Q_2} \overline{Q_1} Q_0$$

$$\downarrow$$

$$\overline{Q_1} Q_0$$

$$\downarrow$$

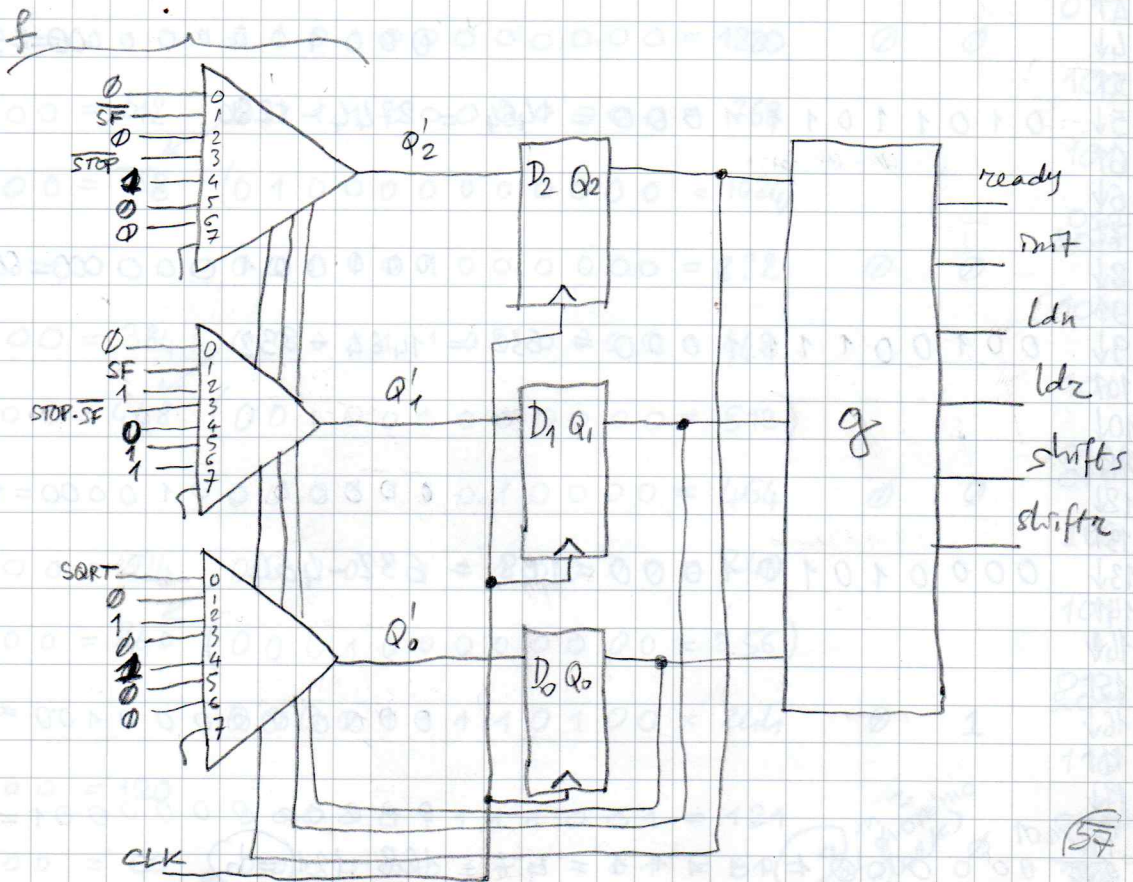
$$\overline{Q_2} Q_1$$

$$\downarrow$$

$$Q_2 \overline{Q_0}$$

| $Q_2 \backslash Q_1 Q_0$ | 00 | 01 | 11 | 10 |
|--------------------------|----|----|----|----|
| 0                        | 0  | 1  | 0  | 0  |
| 1                        | 1  | 0  | X  | 0  |

$$ldn = Q_2 \overline{Q_1} \overline{Q_0} + \overline{Q_2} Q_1 Q_0$$





# Funzionamento temporale.

$$N = 3768 = (111010111000)_2$$

La fase adjust termina quando  $s = 2^{14}$ , diviso via via per 4, risulta più piccolo di  $N$ . Questo accade dopo due divisioni per 4 (ciascuna delle quali corrisponde a uno shift a destra di 2 bit):  $s = 2^{10} = (010000000000)_2 = 1024$

Vediamo il funzionamento a partire dallo stato UPDATEsII in cui si ottiene per la prima volta  $N \geq s$ , ossia  $SF = 0$ .

| t   | n                                  | s                       |      |
|-----|------------------------------------|-------------------------|------|
| 0↑  |                                    |                         |      |
| 0↓  | 111010111000 = 3768                | 0100000000000000 = 1024 | 0000 |
| 1↑  |                                    |                         |      |
| 1↓  | 101010111000 = 2744 = 3768 - 1024  |                         | 0000 |
| 2↑  |                                    |                         |      |
| 2↓  |                                    |                         | 0100 |
| 3↑  |                                    |                         |      |
| 3↓  |                                    | 0010000000000000 = 512  |      |
| 4↑  |                                    |                         |      |
| 4↓  |                                    | 0001000000000000 = 256  |      |
| 5↑  |                                    |                         |      |
| 5↓  | 010110111000 = 1464 = 2744 - 1280  |                         | 0010 |
| 6↑  |                                    |                         |      |
| 6↓  |                                    |                         | 0011 |
| 7↑  |                                    |                         |      |
| 8↓  |                                    | 0000010000000000 = 64   |      |
| 9↑  |                                    |                         |      |
| 9↓  | 001001111000 = 632 = 1464 - 832    |                         | 0001 |
| 10↑ |                                    |                         |      |
| 10↓ |                                    |                         | 0001 |
| 11↑ |                                    |                         |      |
| 12↓ |                                    | 0000000100000000 = 16   |      |
| 13↑ |                                    |                         |      |
| 13↓ | 000010101000 = 168 = 632 - 464     |                         | 0000 |
| 14↑ |                                    |                         |      |
| 14↓ |                                    |                         | 0000 |
| 15↑ |                                    |                         |      |
| 16↓ |                                    | 00000000000100 = 4      |      |
| 17↑ |                                    |                         |      |
| 17↓ |                                    |                         | 0000 |
| 18↑ |                                    |                         |      |
| 18↓ |                                    | 00000000000001 = 1      | 0000 |
| 19↑ |                                    |                         |      |
| 20↓ | 000000101111 = 47 = 168 - 121 = 47 |                         | 0000 |

| STATO PRESENTE    | USCITE generate nello stato | operazioni svolte                            |
|-------------------|-----------------------------|----------------------------------------------|
| 011 (UPDATE S II) | shifts                      | $S \leftarrow S/2$                           |
| 100 (UPDATE n z)  | ldn, shift z                | $n \leftarrow n - (z + S), z \leftarrow z/2$ |
| 101 (UPDATE z)    | ldz                         | $z \leftarrow z + S$                         |
| 010 (UPDATE S I)  | shifts                      | $S \leftarrow S/2$                           |
| 110 (Halve z)     |                             |                                              |

| z               | z + S (address)                     | STOP | SF | STATO PRESENTE |
|-----------------|-------------------------------------|------|----|----------------|
| 00000000 = 0    | 01000000000000 = 1024               | 0    | 0  | 011            |
| 00000000 = 0    | 01000000000000 = 1024               |      |    | 100            |
| 00000000 = 1024 | (10000000000000 = 2048) → non usato |      |    | 101            |
|                 | (01100000000000 = 1536) → non usato |      |    | 010            |
|                 | 01010000000000 = 1280               | 0    | 0  | 011            |
| 00000000 = 512  | 00110000000000 = 768                |      |    | 100            |
| 00000000 = 768  | (01000000000000 = 1024)             |      |    | 101            |
|                 | 00110100000000 = 832                | 0    | 0  | 010 & 011      |
| 10000000 = 384  | 00011100000000 = 448                |      |    | 100            |
| 11000000 = 448  | (00100000000000 = 512)              |      |    | 101            |
|                 | 00011101000000 = 464                | 0    | 0  | 010 & 011      |
| 11100000 = 224  | 00001111000000 = 240                |      |    | 100            |
| 11110000 = 240  | (00010000000000 = 256)              |      |    | 101            |
|                 | 00001111010000 = 244                | 0    | 1  | 010 & 011      |
| 01111000 = 120  | 00000111100001 = 121                |      |    | 110            |
| 00111100 = 60   | 00000001111001 = 61 (al clock) →    |      |    | 010 & 011      |
|                 |                                     |      |    | 100            |

va a 1  
al clock  
23↓

?  $S=0$   
?  $n < z + S$



Funzionamento temporale.

$N = 3768 = (111010111000)_2$

La fase adjust termina quando  $S = 2^4$ , diviso una volta per 4, risulta più piccolo di N. Questo accade dopo due divisioni per 4 (ciascuna delle quali consiste a uno shift a sinistra di 2 bit):  $S = 2^{10} = (010000000000)_2 = 1024$

Vediamo il funzionamento a partire dallo stato UPDATES II in cui si ottiene per la prima volta  $N \geq S$ , ossia  $SF = 0$ .

| t    | m            | S    | z            | z+s (address) | STOP | SF |
|------|--------------|------|--------------|---------------|------|----|
| 0↑   | 111010111000 | 3768 | 010000000000 | 1024          | 0    | 0  |
| 1↑   | 101010111000 | 2744 | 000000000000 | 1024          | 0    | 0  |
| 2↑   | 101010111000 | 2744 | 000000000000 | 1024          | 0    | 0  |
| 3↑   | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 4↑   | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 5↑   | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 6↑   | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 7↑   | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 8↑   | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 9↑   | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 10↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 11↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 12↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 13↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 14↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 15↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 16↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 17↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 18↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 19↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 20↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 21↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 22↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 23↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 24↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 25↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 26↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 27↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 28↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 29↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 30↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 31↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 32↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 33↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 34↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 35↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 36↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 37↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 38↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 39↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 40↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 41↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 42↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 43↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 44↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 45↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 46↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 47↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 48↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 49↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 50↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 51↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 52↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 53↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 54↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 55↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 56↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 57↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 58↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 59↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 60↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 61↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 62↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 63↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 64↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 65↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 66↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 67↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 68↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 69↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 70↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 71↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 72↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 73↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 74↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 75↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 76↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 77↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 78↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 79↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 80↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 81↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 82↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 83↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 84↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 85↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 86↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 87↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 88↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 89↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 90↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 91↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 92↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 93↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 94↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 95↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 96↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 97↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 98↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 99↑  | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 100↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 101↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 102↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 103↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 104↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 105↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 106↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 107↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 108↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 109↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 110↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 111↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 112↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 113↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 114↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 115↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 116↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 117↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 118↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 119↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 120↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 121↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 122↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 123↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 124↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 125↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 126↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 127↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 128↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 129↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 130↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 131↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 132↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 133↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 134↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 135↑ | 001000000000 | 512  | 000000000000 | 1024          | 0    | 0  |
| 136↑ | 001000000000 | 512  | 00000000000  |               |      |    |