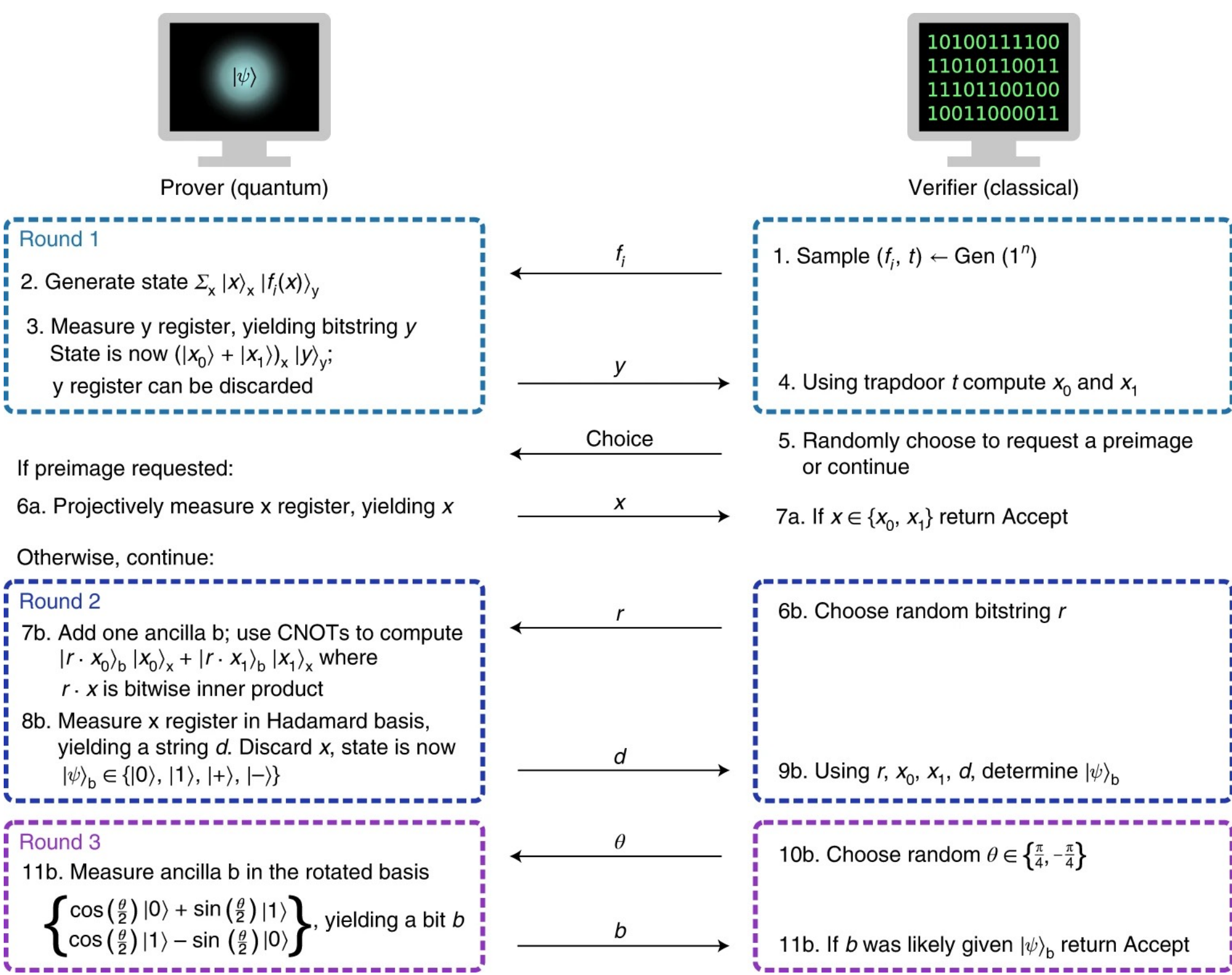


Computational Bell Test with Classiq

Elena Suraeva
 Sel



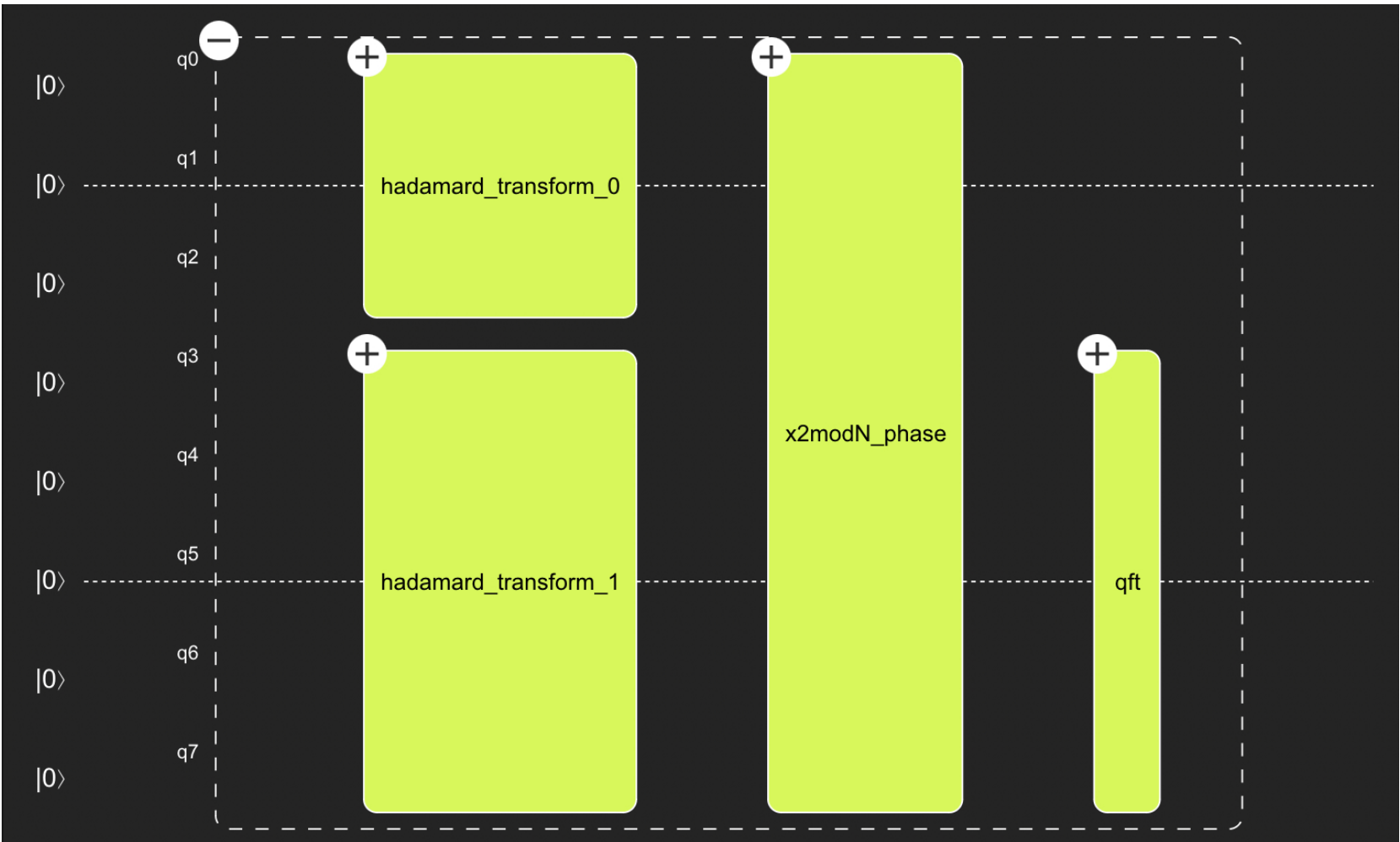
First round

Random p, q

$p = 3, q = 7$

```
Accept 29 squared modulo 589 is 252
Accept 26 squared modulo 589 is 87
Accept 15 squared modulo 589 is 225
Accept 2 squared modulo 589 is 4
Accept 10 squared modulo 589 is 100
Accept 9 squared modulo 589 is 81
Accept 7 squared modulo 589 is 49
Accept 0 squared modulo 589 is 0
Accept 21 squared modulo 589 is 441
Accept 28 squared modulo 589 is 195
Accept 31 squared modulo 589 is 372
Accept 4 squared modulo 589 is 16
Accept 13 squared modulo 589 is 169
Accept 14 squared modulo 589 is 196
Accept 20 squared modulo 589 is 400
Accept 16 squared modulo 589 is 256
Accept 30 squared modulo 589 is 311
Accept 12 squared modulo 589 is 144
Accept 18 squared modulo 589 is 324
Accept 27 squared modulo 589 is 140
Accept 1 squared modulo 589 is 1
Accept 19 squared modulo 589 is 361
Accept 6 squared modulo 589 is 36
Accept 3 squared modulo 589 is 9
Accept 8 squared modulo 589 is 64
Accept 24 squared modulo 589 is 576
Accept 11 squared modulo 589 is 121
Accept 25 squared modulo 589 is 36
Accept 5 squared modulo 589 is 25
Accept 23 squared modulo 589 is 529
Accept 25 squared modulo 589 is 36
Accept 17 squared modulo 589 is 289
```

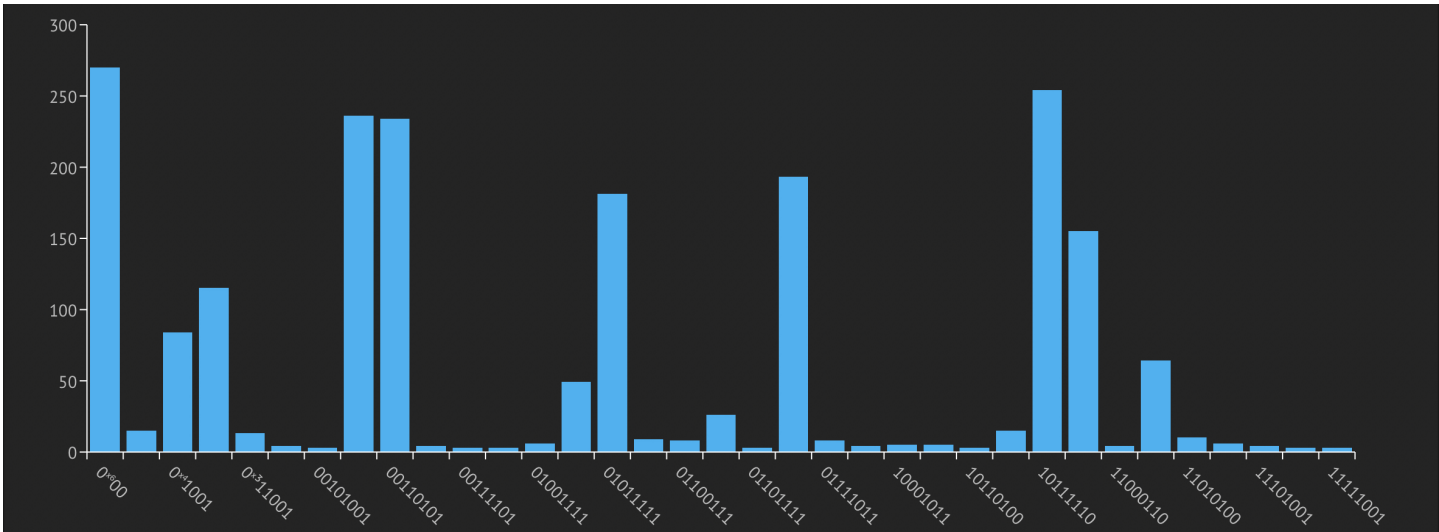
/x2_mod_589.qprog



```
Accept 0 squared modulo 21 is 0
Accept 6 squared modulo 21 is 15
Accept 2 squared modulo 21 is 4
Accept 5 squared modulo 21 is 4
Accept 3 squared modulo 21 is 9
Accept 7 squared modulo 21 is 7
Accept 4 squared modulo 21 is 16
Accept 1 squared modulo 21 is 1
```

$f_{21}(2)=f_{21}(5)=4$

$|2\rangle+|5\rangle=|010\rangle+|101\rangle$

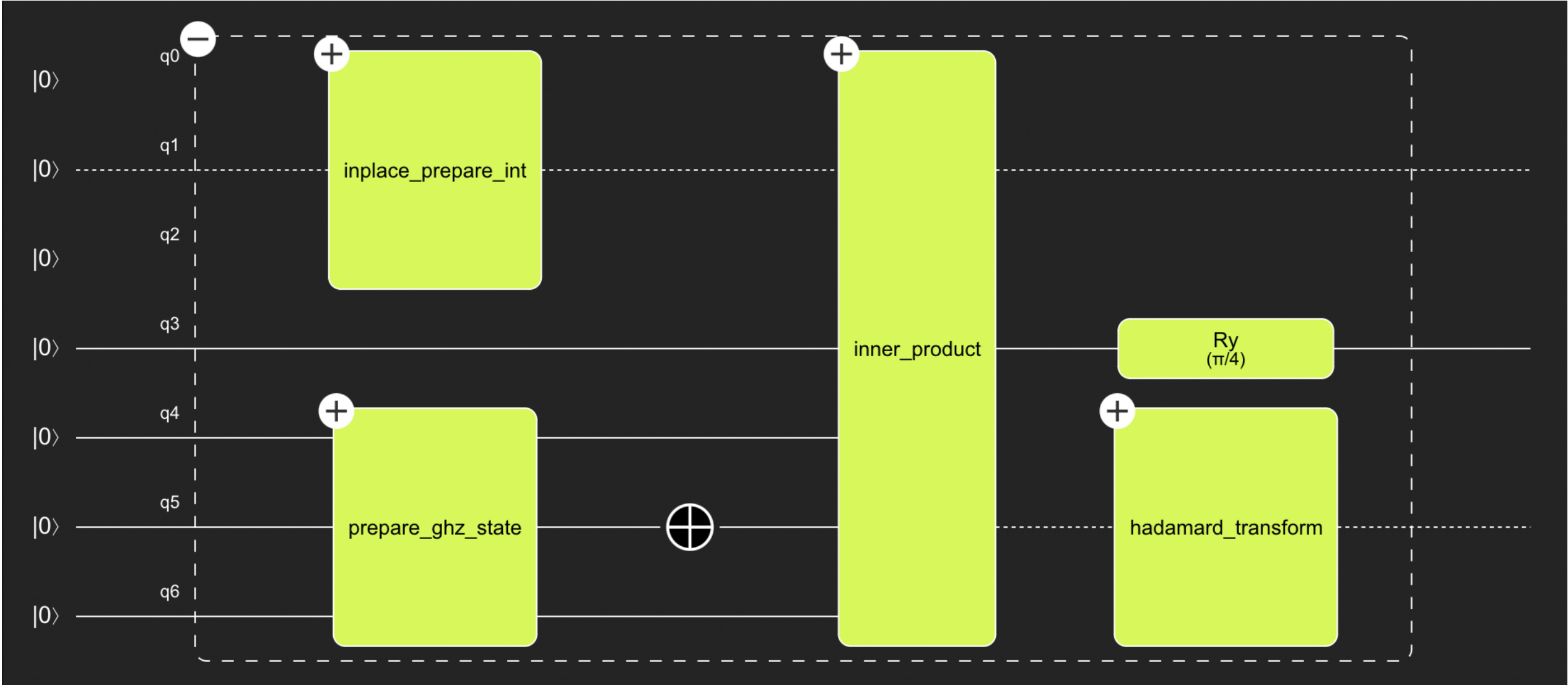


/x2_mod_21.qprog

Final round

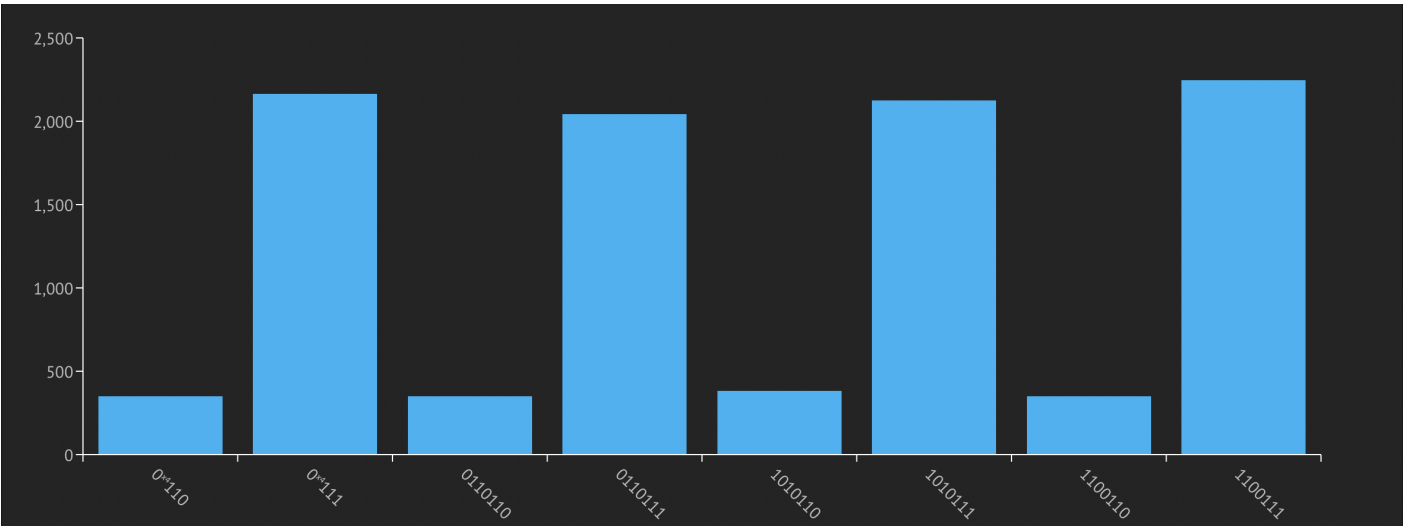
$$\mathbf{r} \cdot \mathbf{X}_0 = \mathbf{r} \cdot \mathbf{X}_1$$

Accept	86.15%
Accept	85.39%
Accept	84.80%
Accept	86.50%

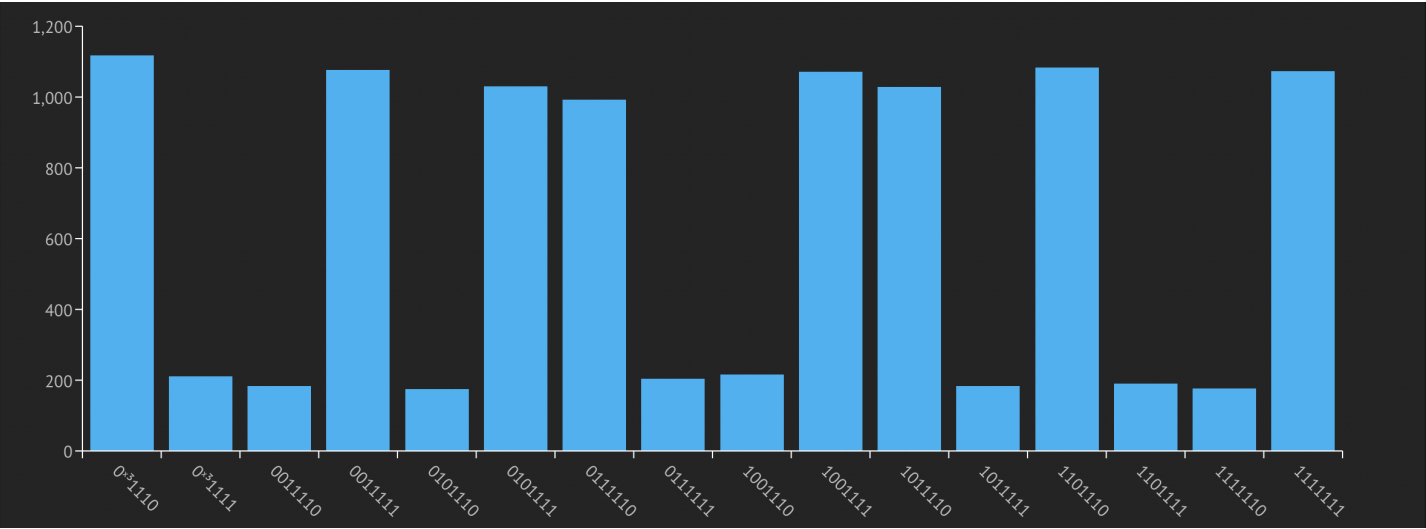


$$\mathbf{r} \cdot \mathbf{X}_0 \neq \mathbf{r} \cdot \mathbf{X}_1$$

Accept	84.17%
Accept	85.46%
Accept	85.55%
Accept	83.01%
Accept	83.27%
Accept	84.95%
Accept	85.14%
Accept	85.91%



/same.qprog



/diff.qprog