Distinct powers

Problem 29

Consider all integer combinations of a^b for $2 \le a \le 5$ and $2 \le b \le 5$:

```
2²=4,   2³=8,    2⁴=16,   2⁵=32
3²=9,   3³=27,   3⁴=81,   3⁵=243
4²=16,  4³=64,   4⁴=256,  4⁵=1024
5²=25,  5³=125,  5⁴=625,  5⁵=3125
```

If they are then placed in numerical order, with any repeats removed, we get the following sequence of 15 distinct terms:

```
4, 8, 9, 16, 25, 27, 32, 64, 81, 125, 243, 256, 625,
1024, 3125
```

How many distinct terms are in the sequence generated by a^b for $2 \le a \le 100$ and $2 \le b \le 100$?

Solution

In [1]: ▶ | print(len(set(a**b for a in range(2, 101) for b in range(2

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