

Roulette-Wheel Sampling

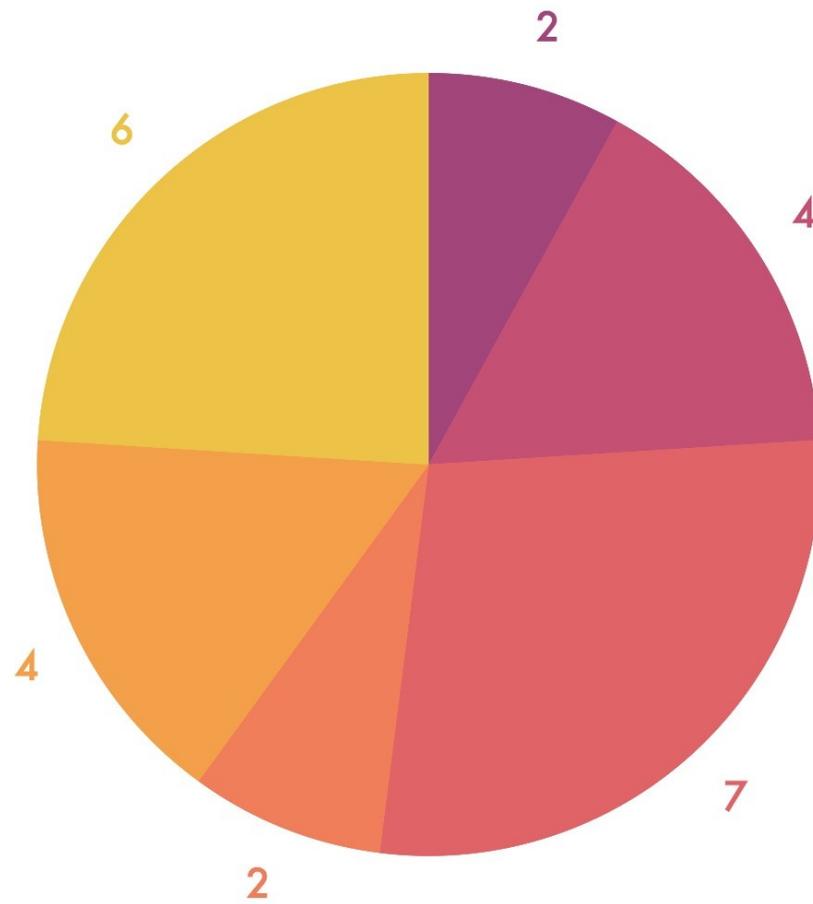
elements: **a** **b** **c** **d** **e** **f**

weights: 6 2 4 7 2 4



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$$6 + 2 + 4 + 7 + 2 + 4 = 25$$

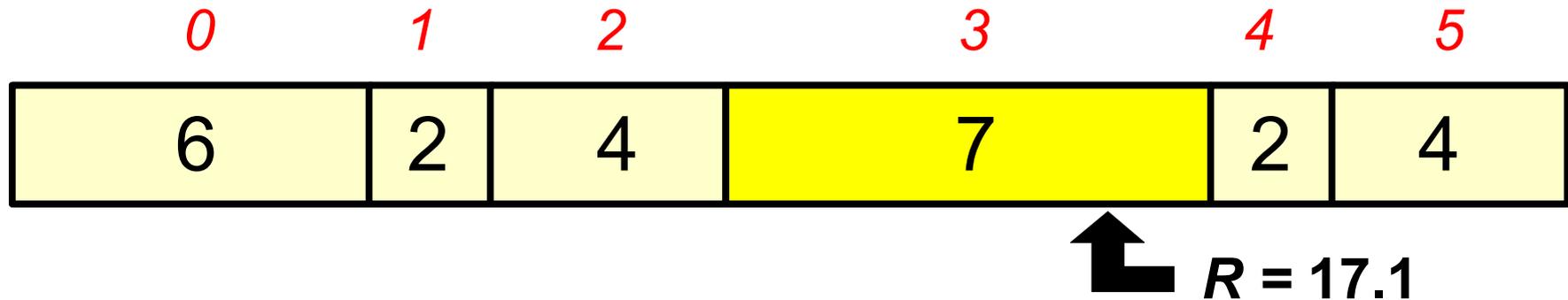
pick a random real number R from 0.0 to 24.9999

```
import random
```

```
R = random.uniform(0, 25)
```

elements: **a** **b** **c** **d** **e** **f**

weights: 6 2 4 7 2 4



$$6 + 2 + 4 + 7 + 2 + 4 = 25$$

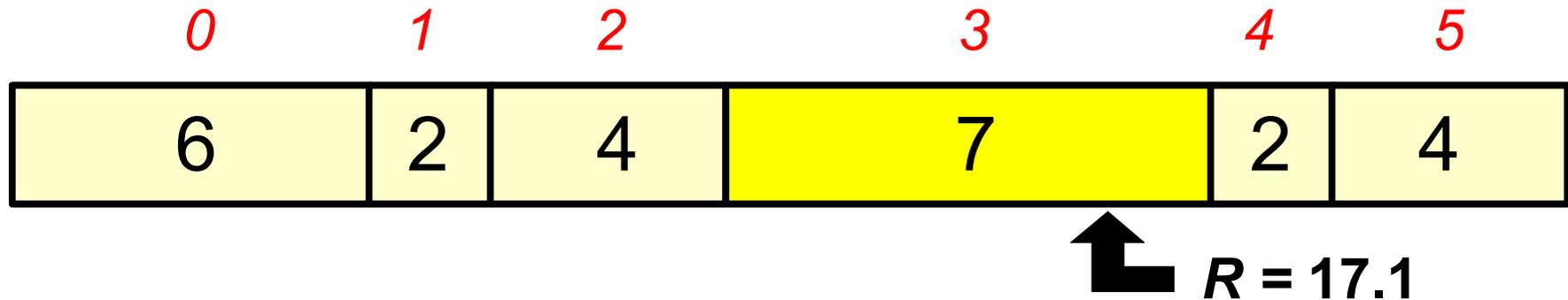
pick a random real number R from 0.0 to 24.9999

$$R = 17.1$$

position number of the associated weight value = 3

elements: **a** **b** **c** **d** **e** **f**

weights: 6 2 4 7 2 4



$$6 + 2 + 4 + 7 + 2 + 4 = 25$$

pick a random real number R from 0.0 to 24.9999

$$R = 17.1$$

corresponding element **d** is returned

```
def weighted_choice(elements, weights):  
    ...
```

```
weighted_choice(['a', 'b', 'c', 'd', 'e', 'f'],  
                [6, 2, 4, 7, 2, 4])
```

→ 'd' *with probability 7/25 on average*

```
weighted_choice(['a', 'b', 'c', 'd', 'e', 'f'],  
                [0, 0, 0, 0, 0, 0])
```

→ *same as calling* `random.choice(elements)`