

[illegible]

--	--	--	--	--

[illegible][illegible]

--	--	--	--	--	--

“ ”

--	--	--	--	--	--	--	--

[illegible]

graph TD

subgraph 〇〇〇〇〇〇〇〇・〇〇〇〇〇

```
Sys1["□□□□□□□□<br/>□12□·□□□□·129,600□□□□□□□□"]
```

```
Sys2["□□□□□□□□<br/>□360□·□□□□□□□□·□□□□□□"]
```

```
Sys3["XXXXXXXXXXXX<br/>4320.XXXXX.XXXXXX"]
```

end

```
subgraph 子图 · 子图
```

```
Sys4["XXXXXXXXXX<br/>XXXXX·XXXXXXXXXX·289,816,576XXXXX"]
```

end

Sys1 --> Sys2

Sys2 --> Sys3

Sys1 -.->|XXXXXXXXXX vs XXXXXX| Sys4

Sys2 -.->|■■■■■■■129,600 vs ■■30,720| Sys4

```
Sys3  -.->|XXXXXXXX 1234| Sys4
```

-



1.1 | | | | | | | | | | |--|--|--|--|--|--|--|--|--| | | | | | | | | | | |--|--|--|--|--|--|--|--|--|

1.  
- 
 - 
 - 
2.  

- [100 boxes]
- [10 boxes] “ [100 boxes] ”
- [100 boxes]

3. [10 boxes] [1 box]
- [100 boxes]
 - [100 boxes]

960 [10 boxes] **3,840** [1 box]

1.2 [10 boxes]

“ [10 boxes] ” [10 boxes]

[100 boxes]
[100 boxes]
[100 boxes]

“ [10 boxes] ”
[10 boxes] .

“ “

[100 boxes]
[10 boxes]
[100 boxes]
[100 boxes]
[10 boxes] ”

[10 boxes] [10 boxes] [100 boxes] [10 boxes] “

[100 boxes] ” [10 boxes]

[10 boxes]

[10 boxes] [10 boxes] [10 boxes] [10 boxes] [10 boxes] [10 boxes] [10 boxes]

[100 boxes]

2.1 [10 boxes]

• [10 boxes] • [10 boxes]

[100 boxes]

[10 boxes]	[10 boxes]	[10 boxes]	[10 boxes]	[10 boxes]	[10 boxes]	[10 boxes] [10 boxes]
[10 boxes]	[10 boxes]	[10 boxes]	[10 boxes]	[10 boxes] / [10 boxes]	[10 boxes]	[10 boxes] [10 boxes] ...
[10 boxes]	[10 boxes]	[10 boxes]	[10 boxes]	[10 boxes] / [10 boxes]	[10 boxes]	[10 boxes] [10 boxes] ...

3.1

-  10  10  10  10 
 -   = $(10 + 10 + 10 + 10) * 4 = 160$
-  12  12  12  12 
 -   = $(12 + 12 + 12 + 12) * 4 = 192$
-   = $160 * 192 = 30,720$


3.2

112  152 

 “

 ”

-  
 -  160  12  $12 * 4 = 48$ 
 -  = $160 - 48 = 112$ 
-  
 -  192  10  $10 * 4 = 40$ 
 -  = $192 - 40 = 152$ 
-  
 -  $160 + 192 = 352$ 
 -  $112 + 152 = 264$ 







4.1



1.  •  
 -  112  152   () = $112 * 152 = 17,024$
 - 

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

項目	数量 個	数量 個	単位
部材	XXXXXXXXXXXX 個	XXXXXXXXXXXX 個	XXXXXXXXXX
XXXXXXXXXX	数量 27,000 個 XXXXXXXXXXXX	XXXXXXXXXX XXXXXXXXXXXX	XXXXXXXXXX
部材	XXXXXXXXXXXX 数量 8個 数量 86,400 個	数量 9個 / 70個 数量 264 個 7 数量 9 個	XXXXXXXXXX
XXXXXXXXXX	数量 113,400 個 XXXXXXXX	XXXXXXXXXX XXXXXXXXXXXX	XXXXXXXXXX
部材	XXXXXXXXXX XXXXXXXXXXXX 43,200 個	XXXXXXXXXX XXXXXXXXXXXX 3 数量	“XXXXXXXXXX”

XXXXXXXXXX “
XX
XX”
個
XX
数量 2/3 個 1/3 個

5.2 XXXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXX
1個 2個 3個 4 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

1. XXXXXXXXXXXXXXX 1個
2. XXXXXXXXXXXXXXX 2個
3. XXXXXXXXXXXXXXX 3個
4. XXXXXXXXXXXXXXX 4個
XX

XXX XXXXXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

6.1 XXXXXXX Python / Pydantic XXX

```

# coding: utf-8
from dataclasses import dataclass
from typing import List, Dict, Optional
from enum import Enum

class TianShengTone(Enum):
    PING = "平" # 阴平
    SHANG = "上" # 阴上
    QU = "去" # 阴去
    RU = "入" # 阴入

class DiYinMouth(Enum):
    KAI = "开" # 阴开
    FA = "发" # 阴发
    SHOU = "收" # 阴收
    BI = "闭" # 阴闭

@dataclass(frozen=True)
class TianShengEntity:
    index: int # 1 ~ 16
    char: str # 阴平, 阴上, 阴去, 阴入
    tone: TianShengTone # 阴平 / 阴上 / 阴去 / 阴入
    pishi: str # 阴平 / 阴上
    is_usable: bool # 阴平 (True), 阴上 (False)

@dataclass(frozen=True)
class DiYinEntity:
    index: int # 1 ~ 16
    char: str # 阴平, 阴上, 阴去, 阴入
    mouth: DiYinMouth # 阴平 / 阴上 / 阴去 / 阴入
    qingzhuo: str # 阴平 / 阴上
    is_usable: bool # 阴平 (True), 阴上 (False)

@dataclass(frozen=True)
class HuangjiSoundHarmonicResult:
    tian_sheng: TianShengEntity
    di_yin: DiYinEntity
    is_harmonic: bool # 阴平 (True)
    tian_chang_bian: int # 阴平 (7 * 152 = 1064 阴平)

```

```
di_he_hua: int      # 字典 (9 * 112 = 1008 字节)
```

```
tong_shu: int       # 统计 (289,816,576)
```

Invariant

```
def test_huangji_sound_invariants():
    # 1. 四四四四
    TI_YANG = (10 + 10 + 10 + 10) * 4 # 160
    TI_YIN = (12 + 12 + 12 + 12) * 4 # 192
    assert TI_YANG == 160
    assert TI_YIN == 192

    YONG_YANG = TI_YANG - (12 * 4) # 160 - 48 = 112
    YONG_YIN = TI_YIN - (10 * 4) # 192 - 40 = 152
    assert YONG_YANG == 112
    assert YONG_YIN == 152

    # 2. 四四四四
    ALL_NUMBER = TI_YANG * TI_YIN
    assert ALL_NUMBER == 30720

    # 3. 四四四四四四四四四四
    DONG_SHU = YONG_YANG * YONG_YIN
    ZHI_SHU = YONG_YIN * YONG_YANG
    assert DONG_SHU == 17024
    assert ZHI_SHU == 17024

    # 4. 四四四四四
    TONG_SHU = DONG_SHU * ZHI_SHU
    assert TONG_SHU == 289816576 # 四四四四四四四四四四四四
```





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□□□ #1

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