词典

散列：循对象访问

09-A1

We are shaped by our thoughts; we become what we think.

- Buddha

Man's thought is shaped by his tongue.

- Anonymous

于是在熟人中，我们话也少了，我们“眉目传情”，我们“指石相证”，
我们抛开了比较间接的象征原料，而求更直接的会意了。

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联合数组：更直接、更有效的访问

❖ 数组？再常见不过，比如：

```
fib[0] = 0
fib[1] = 1
fib[2] = 1
fib[3] = 2
fib[4] = 3
fib[5] = 5
fib[6] = 8
...
```

❖ Associative Array

——与常规的数组有何区别？

❖ 根据数据元素的取值，直接访问！

```
style["关羽"] = "云长"
style["张飞"] = "翼德"
style["赵云"] = "子龙"
style["马超"] = "孟起"
```

❖ 下标不再是整数，甚至没有大小次序

——更为直观、便捷

❖ 支持的语言：

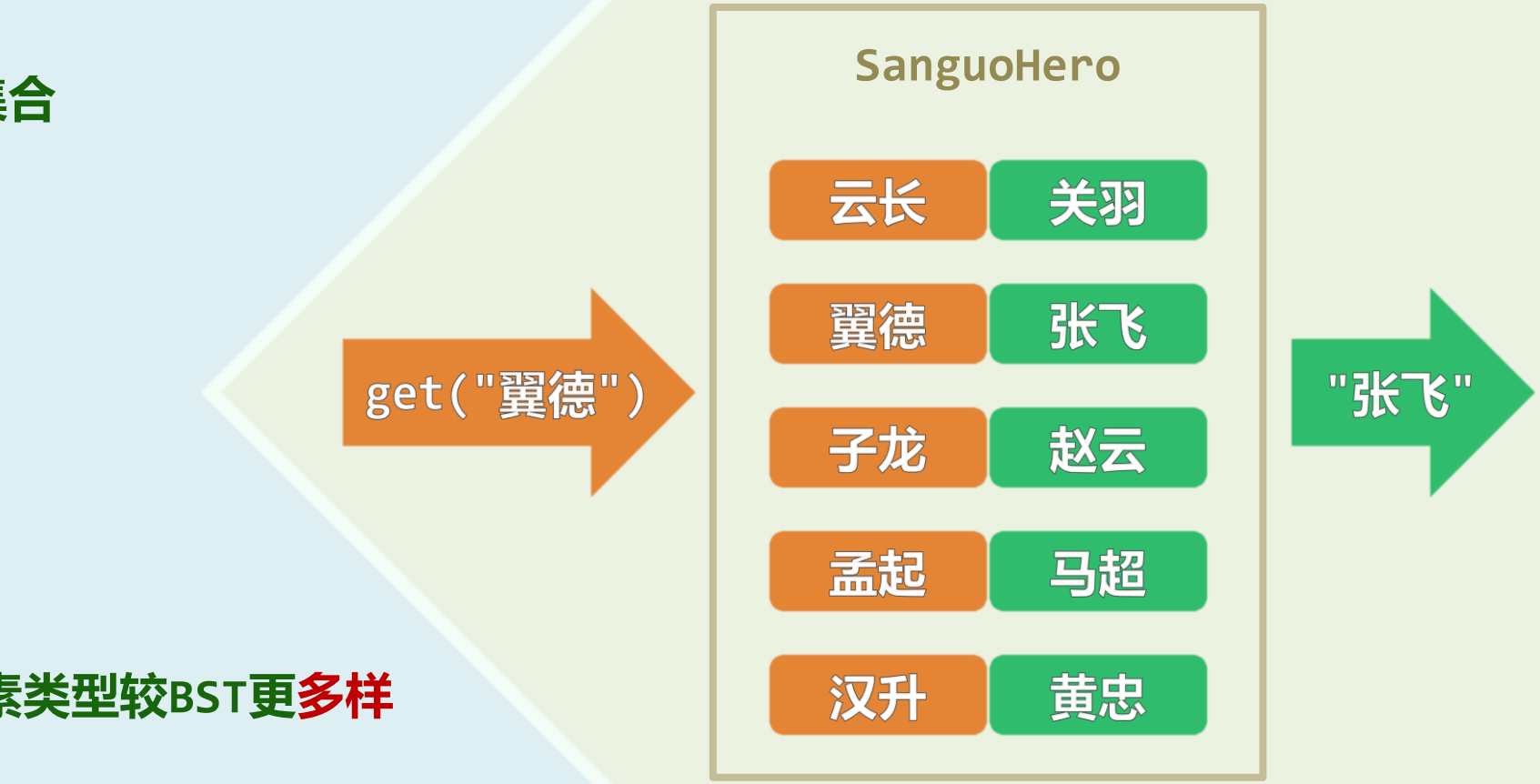
Snobol4、MUMPS、SETL、Rexx、AWK、

Java、Python、Perl、Ruby、PHP、...

词条 ~ 映射/词典

- entry = (key, value)
- Map/Dictionary：词条的集合
  - 关键码禁止/允许雷同
  - get(key)
    put(key, value)
    remove(key)
- 关键码未必可定义大小，元素类型较BST更多样

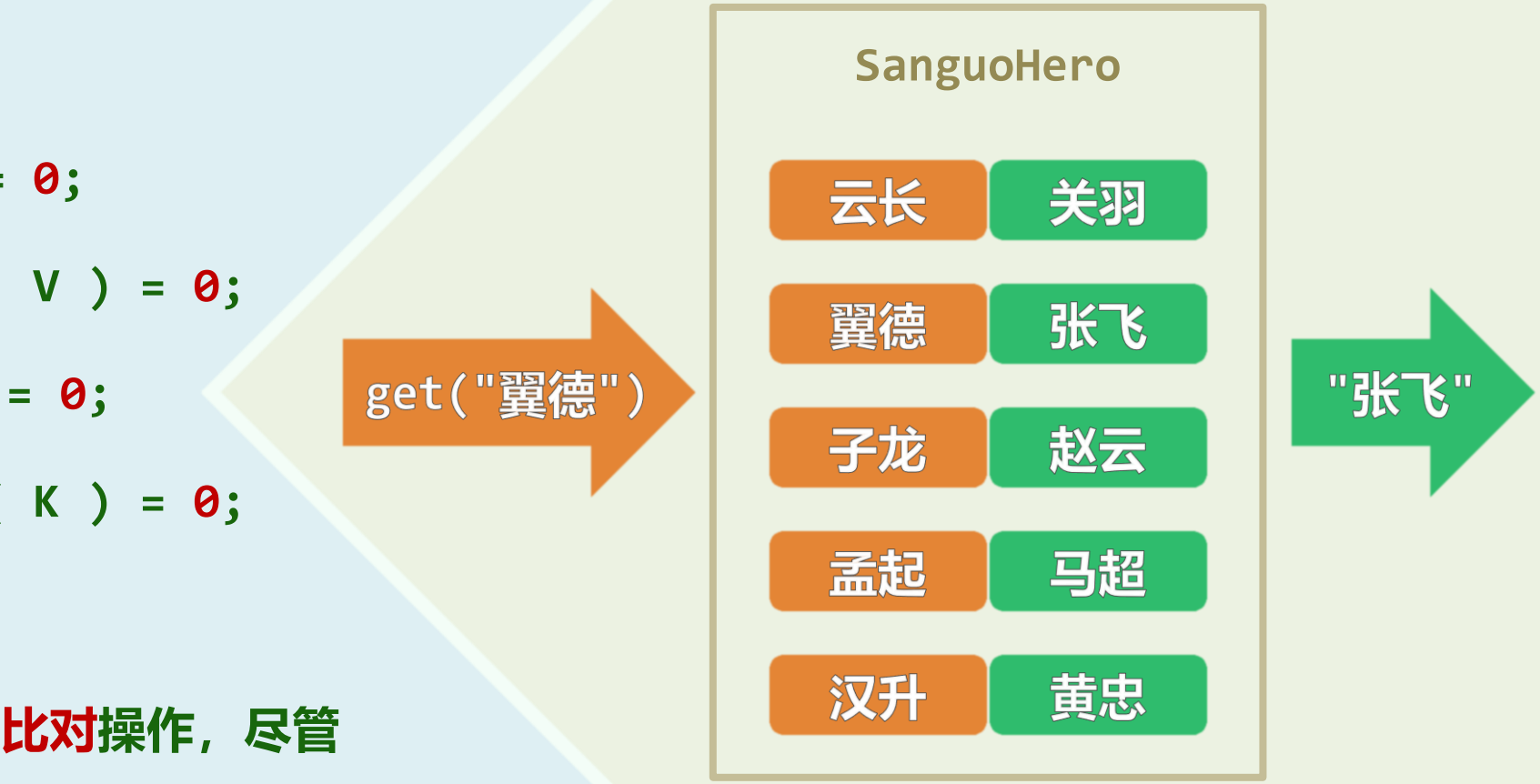
  查找对象不限于最大/最小词条，接口功能较PQ更强大



Dictionary

```
template <typename K, typename V> //key、value
struct Dictionary {
    virtual int size() = 0;
    virtual bool put( K, V ) = 0;
    virtual V* get( K ) = 0;
    virtual bool remove( K ) = 0;
};
```

- 词典中的词条只需支持判等/比对操作，尽管诸如Java::TreeMap等实现仍支持大小/比较器



Java: HashMap + Hashtable

```
import java.util.*;
public class Hash {
    public static void main(String[] args) {
        HashMap HM = new HashMap(); //Map
            HM.put("东岳", "泰山"); HM.put("西岳", "华山"); HM.put("南岳", "衡山");
            HM.put("北岳", "恒山"); HM.put("中岳", "嵩山"); System.out.println(HM);
        Hashtable HT = new Hashtable(); //Dictionary
            HT.put("东岳", "泰山"); HT.put("西岳", "华山"); HT.put("南岳", "衡山");
            HT.put("北岳", "恒山"); HT.put("中岳", "嵩山"); System.out.println(HT);
    }
}
```

Perl: %Hash Type

- 由字符串（string）标识的一组无序标量（scalar） //亦即MAP
- my %hero = ("云长"=>"关羽", "翼德"=>"张飞", "子龙"=>"赵云", "孟起"=>"马超");

```
foreach $style (keys %hero) # Hash类型的变量由%引导
 { print "$style => $hero{$style}\n"; }
```

- $hero{"汉升"} = "黄忠";

```
foreach $style (keys %hero)
 { print "$style => $hero{$style}\n"; }
foreach $style (reverse sort keys %hero)
 { print "$style => $hero{$style}\n"; }
```

Python: Dictionary Class

```
beauty = dict( { "沉鱼":"西施", "落雁":"昭君", "闭月":"貂蝉", "羞花":"玉环" } )
print beauty
```

```
beauty["红颜"] = "圆圆"
print beauty
```

```
for alias, name in beauty.items():
    print alias, ":", name
```

```
for alias, name in sorted(beauty.items()):
    print alias, ":", name
```

```
for alias in sorted(beauty.keys(), reverse = True):
    print alias, ":", beauty[alias]
```

Ruby: Hash Table

```
scarborough = # declare and initialize a hashtable
   { "P"=>"parsley", "S"=>"sage", "R"=>"rosemary", "T"=>"thyme" }
puts scarborough # output the hash table
for k in scarborough.keys # output hash table items
   puts k + "=>" + scarborough[k] # 1-by-1
end
for k in scarborough.keys.sort # output hash table items
   puts k + "=>" + scarborough[k] # 1-by-1 in order
end
```