

1.2 - Indexing meno banale

April 11, 2017

```
In [1]: import pandas as pd
```

```
In [2]: s = pd.Series(range(291, 358, 3),  
                      index=range(97, 120))
```

```
In [3]: s
```

```
97      291  
98      294  
99      297  
100     300  
101     303  
102     306  
103     309  
104     312  
105     315  
106     318  
107     321  
108     324  
109     327  
110     330  
111     333  
112     336  
113     339  
114     342  
115     345  
116     348  
117     351  
118     354  
119     357  
dtype: int64
```

```
In [4]: s.iloc[1], s.loc[98], s[98]
```

```
Out[4]: (294, 294, 294)
```

```
In [5]: s.iloc[:15]
```

```
97      291
98      294
99      297
100     300
101     303
102     306
103     309
104     312
105     315
106     318
107     321
108     324
109     327
110     330
111     333
dtype: int64
```

```
In [6]: # Include l'estremo!
        s.loc[:100]
```

```
97      291
98      294
99      297
100     300
dtype: int64
```

```
In [7]: s.loc[108:110]
```

```
108     324
109     327
110     330
dtype: int64
```

```
In [8]: s.loc[5]
```

```
-----
KeyError                                Traceback (most recent call last)
/home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in _has_valid_type
1432         if key not in ax:
-> 1433             error()
```

```

1434             except TypeError as e:

                /home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in error()
1427                 raise KeyError("the label [%s] is not in the [%s]" %
-> 1428                     (key, self.obj._get_axis_name(axis)))
1429

```

```

KeyError: 'the label [5] is not in the [index]'
```

During handling of the above exception, another exception occurred:

```

KeyError                                Traceback (most recent call last)

<ipython-input-8-ac12912d6e41> in <module>()
----> 1 s.loc[5]

    /home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in __getitem__(self, key)
1325         else:
1326             key = com._apply_if_callable(key, self.obj)
-> 1327             return self._getitem_axis(key, axis=0)
1328
1329     def _is_scalar_access(self, key):

    /home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in _getitem_axis(self, key, axis)
1548
1549     # fall thru to straight lookup
-> 1550     self._has_valid_type(key, axis)
1551     return self._get_label(key, axis=axis)
1552

    /home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in _has_valid_type(self, key, axis)
1439         raise
1440     except:
-> 1441         error()
1442
1443     return True

    /home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in error()
1426         "key")
1427     raise KeyError("the label [%s] is not in the [%s]" %

```

```
-> 1428                                     (key, self.obj._get_axis_name(axis))
    1429
    1430                                     try:
```

```
        KeyError: 'the label [5] is not in the [index]'
```

```
In [9]: # ?
        s.loc[:5]
```

```
Series([], dtype: int64)
```

```
In [10]: s2 = pd.Series(['a', 'b', 'c'],
                        index=[1,2,4])
```

```
In [11]: s2
```

```
1    a
2    b
4    c
dtype: object
```

```
In [12]: s2.loc[:5]
```

```
1    a
2    b
4    c
dtype: object
```

```
In [13]: s.loc[[97, 99, 100]]
```

```
97    291
99    297
100   300
dtype: int64
```

```
In [14]: s.iloc[[0, 2, 3]]
```

```
97    291
99    297
100   300
dtype: int64
```

```
In [15]: s.index.get_indexer([97, 99, 100])
```

```
Out[15]: array([0, 2, 3])
```

```
In [16]: s.iloc[s.index.get_indexer([97, 99, 100])] == s.loc[[97, 99, 100]]
```

```
97      True
99      True
100     True
dtype: bool
```

```
In [17]: # Le tuple e le liste sono diverse in pandas (e in numpy)
         s.loc[(97, 99, 100)]
```

```
-----
IndexingError                                Traceback (most recent call last)

<ipython-input-17-3d2b774cc091> in <module>()
      1 # Le tuple e le liste sono diverse in pandas (e in numpy)
----> 2 s.loc[(97, 99, 100)]

/home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in __getitem__(self, key)
    1322         except (KeyError, IndexError):
    1323             pass
-> 1324         return self._getitem_tuple(key)
    1325     else:
    1326         key = com._apply_if_callable(key, self.obj)

/home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in _getitem_tuple(self, tup)
    838
    839     # no multi-index, so validate all of the indexers
--> 840     self._has_valid_tuple(tup)
    841
    842     # ugly hack for GH #836

/home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in _has_valid_tuple(self, tup)
    185     for i, k in enumerate(key):
    186         if i >= self.obj.ndim:
--> 187             raise IndexingError('Too many indexers')
    188         if not self._has_valid_type(k, i):
    189             raise ValueError("Location based indexing can only have")
```

```
IndexingError: Too many indexers
```

```
In [18]: sb = pd.Series([1,2,4]) == [1,2,3]
```

```
In [19]: sb
```

```
0    True
1    True
2   False
dtype: bool
```

```
In [20]: pd.Series([1,2,3], index=[7,7,7]).index.is_monotonic
```

```
Out[20]: True
```

```
In [21]: s.loc[:100]
```

```
97    291
98    294
99    297
100   300
dtype: int64
```

```
In [22]: s.loc[slice(100)]
```

```
97    291
98    294
99    297
100   300
dtype: int64
```

```
In [23]: dispari = s % 2 == 1
```

```
In [24]: dispari
```

```
97    True
98   False
99    True
100   False
101    True
102   False
```

```
103     True
104     False
105     True
106     False
107     True
108     False
109     True
110     False
111     True
112     False
113     True
114     False
115     True
116     False
117     True
118     False
119     True
dtype: bool
```

```
In [25]: s.loc[dispari]
```

```
97     291
99     297
101    303
103    309
105    315
107    321
109    327
111    333
113    339
115    345
117    351
119    357
dtype: int64
```

0.1 Setitem

```
In [26]: s
```

```
97     291
98     294
99     297
100    300
101    303
102    306
```

```
103    309
104    312
105    315
106    318
107    321
108    324
109    327
110    330
111    333
112    336
113    339
114    342
115    345
116    348
117    351
118    354
119    357
dtype: int64
```

```
In [27]: s.loc[118] = -1
```

```
In [28]: s.loc[101:108] = -2
```

```
In [29]: s.iloc[0] = 3
```

```
In [30]: s.loc[23] = 15
```

```
In [31]: s
```

```
97      3
98     294
99     297
100     300
101     -2
102     -2
103     -2
104     -2
105     -2
106     -2
107     -2
108     -2
109     327
110     330
111     333
112     336
113     339
114     342
```



```
115     345
116     348
117     351
118     -1
119     357
23      15
dtype: int64
```

```
In [32]: # ?
         s.loc[25:29] = [0,1,2,3,4]
```

```
-----

ValueError                                Traceback (most recent call last)

/home/pietro/nobackup/repo/pandas/pandas/indexes/base.py in get_slice_bound
3354         try:
-> 3355             return self._searchsorted_monotonic(label, side)
3356         except ValueError:

/home/pietro/nobackup/repo/pandas/pandas/indexes/base.py in _searchsorted_m
3320
-> 3321         raise ValueError('index must be monotonic increasing or decreas
3322
```

ValueError: index must be monotonic increasing or decreasing

During handling of the above exception, another exception occurred:

```
KeyError                                Traceback (most recent call last)

<ipython-input-32-109e3afdf938> in <module>()
      1 # ?
----> 2 s.loc[25:29] = [0,1,2,3,4]

/home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in __setitem__(se
175         else:
176             key = com._apply_if_callable(key, self.obj)
--> 177             indexer = self._get_setitem_indexer(key)
178             self._setitem_with_indexer(indexer, value)
179
```

```

/home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in _get_setitem_
162
163         try:
--> 164             return self._convert_to_indexer(key, is_setter=True)
165         except TypeError as e:
166

/home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in _convert_to_in
1148
1149         if isinstance(obj, slice):
-> 1150             return self._convert_slice_indexer(obj, axis)
1151
1152         # try to find out correct indexer, if not type correct raise

/home/pietro/nobackup/repo/pandas/pandas/core/indexing.py in _convert_slice
238         # if we are accessing via lowered dim, use the last dim
239         ax = self.obj._get_axis(min(axis, self.ndim - 1))
--> 240         return ax._convert_slice_indexer(key, kind=self.name)
241
242     def _has_valid_setitem_indexer(self, indexer):

/home/pietro/nobackup/repo/pandas/pandas/indexes/base.py in _convert_slice_
1328         else:
1329             try:
-> 1330                 indexer = self.slice_indexer(start, stop, step, kind=ki
1331             except Exception:
1332                 if is_index_slice:

/home/pietro/nobackup/repo/pandas/pandas/indexes/base.py in slice_indexer(s
3226         """
3227         start_slice, end_slice = self.slice_locs(start, end, step=step,
-> 3228                                             kind=kind)
3229
3230         # return a slice

/home/pietro/nobackup/repo/pandas/pandas/indexes/base.py in slice_locs(self
3407         start_slice = None
3408         if start is not None:
-> 3409             start_slice = self.get_slice_bound(start, 'left', kind)
3410         if start_slice is None:
3411             start_slice = 0

```

```

/home/pietro/nobackup/repo/pandas/pandas/indexes/base.py in get_slice_bound
3356         except ValueError:
3357             # raise the original KeyError
-> 3358             raise err
3359
3360         if isinstance(slc, np.ndarray):
```

```

/home/pietro/nobackup/repo/pandas/pandas/indexes/base.py in get_slice_bound
3350         # we need to look up the label
3351         try:
-> 3352             slc = self.get_loc(label)
3353         except KeyError as err:
3354             try:
```

```

/home/pietro/nobackup/repo/pandas/pandas/indexes/base.py in get_loc(self, k
2320         return self._engine.get_loc(key)
2321     except KeyError:
-> 2322         return self._engine.get_loc(self._maybe_cast_indexer(k
2323
2324         indexer = self.get_indexer([key], method=method, tolerance=tolerance)
```

```

/home/pietro/nobackup/repo/pandas/pandas/_libs/index.pyx in pandas._libs.in
```

```

/home/pietro/nobackup/repo/pandas/pandas/_libs/index.pyx in pandas._libs.in
```

```

/home/pietro/nobackup/repo/pandas/pandas/_libs/hashtable_class_helper.pxi i
```

```

/home/pietro/nobackup/repo/pandas/pandas/_libs/hashtable_class_helper.pxi i
```

```
KeyError: 25
```

```
In [33]: s.loc[(s.index%2) == 1] = -15
```

```
In [34]: s
```

```
97     -15
98     294
```

```
99      -15
100     300
101     -15
102      -2
103     -15
104      -2
105     -15
106      -2
107     -15
108      -2
109     -15
110     330
111     -15
112     336
113     -15
114     342
115     -15
116     348
117     -15
118      -1
119     -15
23      -15
dtype: int64
```