- Concatenating no objects will now raise a `ValueError` rather than a bare `Exception`.
- Merge errors will now be sub-classes of `ValueError` rather than raw `Exception` (GH8501)
- `DataFrame.plot` and `Series.plot` keywords are now have consistent orders (GH8037)

Internal refactoring

In 0.15.0 `Index` has internally been refactored to no longer sub-class `ndarray` but instead subclass `PandasObject`, similarly to the rest of the pandas objects. This change allows very easy sub-classing and creation of new index types. This should be a transparent change with only very limited API implications (GH5080, GH7439, GH7796, GH8024, GH8367, GH7997, GH8522):

- you may need to unpickle pandas version < 0.15.0 pickles using `pd.read_pickle` rather than `pickle.load`. See *pickle docs*
- when plotting with a `PeriodIndex`, the matplotlib internal axes will now be arrays of `Period` rather than a `PeriodIndex` (this is similar to how a `DatetimeIndex` passes arrays of `datetimes` now)
- MultiIndexes will now raise similarly to other pandas objects w.r.t. truth testing, see *here* (GH7897).
- When plotting a DatetimeIndex directly with matplotlib's *plot* function, the axis labels will no longer be formatted as dates but as integers (the internal representation of a `datetime64`). **UPDATE** This is fixed in 0.15.1, see *here*.

Deprecations

- The attributes `Categorical labels` and `levels` attributes are deprecated and renamed to `codes` and `categories`.
- The `outtype` argument to `pd.DataFrame.to_dict` has been deprecated in favor of `orient`. (GH7840)
- The `convert_dummies` method has been deprecated in favor of `get_dummies` (GH8140)
- The `infer_dst` argument in `tz_localize` will be deprecated in favor of `ambiguous` to allow for more flexibility in dealing with DST transitions. Replace `infer_dst=True` with `ambiguous='infer'` for the same behavior (GH7943). See *the docs* for more details.
- The top-level `pd.value_range` has been deprecated and can be replaced by `.describe()` (GH8481)
- The `Index` set operations `+` and `-` were deprecated in order to provide these for numeric type operations on certain index types. `+` can be replaced by `.union()` or `|`, and `-` by `.difference()`. Further the method name `Index.diff()` is deprecated and can be replaced by `Index.difference()` (GH8226)

```
# +
pd.Index(['a', 'b', 'c']) + pd.Index(['b', 'c', 'd'])

# should be replaced by
pd.Index(['a', 'b', 'c']).union(pd.Index(['b', 'c', 'd']))
```

```
# -
pd.Index(['a', 'b', 'c']) - pd.Index(['b', 'c', 'd'])

# should be replaced by
pd.Index(['a', 'b', 'c']).difference(pd.Index(['b', 'c', 'd']))
```

- The `infer_types` argument to *`read_html()`* now has no effect and is deprecated (GH7762, GH7032).

Removal of prior version deprecations/changes

- Remove `DataFrame.delevel` method in favor of `DataFrame.reset_index`

Enhancements

Enhancements in the importing/exporting of Stata files:

- Added support for bool, uint8, uint16 and uint32 data types in `to_stata` (GH7097, GH7365)
- Added conversion option when importing Stata files (GH8527)
- `DataFrame.to_stata` and `StataWriter` check string length for compatibility with limitations imposed in dta files where fixed-width strings must contain 244 or fewer characters. Attempting to write Stata dta files with strings longer than 244 characters raises a `ValueError`. (GH7858)
- `read_stata` and `StataReader` can import missing data information into a `DataFrame` by setting the argument `convert_missing` to `True`. When using this options, missing values are returned as `StataMissingValue` objects and columns containing missing values have `object` data type. (GH8045)

Enhancements in the plotting functions:

- Added `layout` keyword to `DataFrame.plot`. You can pass a tuple of `(rows, columns)`, one of which can be `-1` to automatically infer (GH6667, GH8071).
- Allow to pass multiple axes to `DataFrame.plot`, `hist` and `boxplot` (GH5353, GH6970, GH7069)
- Added support for `c`, `colormap` and `colorbar` arguments for `DataFrame.plot` with `kind='scatter'` (GH7780)
- Histogram from `DataFrame.plot` with `kind='hist'` (GH7809), See *the docs*.
- Boxplot from `DataFrame.plot` with `kind='box'` (GH7998), See *the docs*.

Other:

- `read_csv` now has a keyword parameter `float_precision` which specifies which floating-point converter the C engine should use during parsing, see *here* (GH8002, GH8044)
- Added `searchsorted` method to `Series` objects (GH7447)
- `describe()` on mixed-types DataFrames is more flexible. Type-based column filtering is now possible via the `include`/`exclude` arguments. See the *docs* (GH8164).

```
In [95]: df = pd.DataFrame({'catA': ['foo', 'foo', 'bar'] * 8,
   ....:                    'catB': ['a', 'b', 'c', 'd'] * 6,
   ....:                    'numC': np.arange(24),
   ....:                    'numD': np.arange(24.) + .5})
   ....:

In [96]: df.describe(include=["object"])
Out[96]:
       catA catB
count    24   24
unique    2    4
top     foo    c
freq     16    6

[4 rows x 2 columns]

In [97]: df.describe(include=["number", "object"], exclude=["float"])
```

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```
Out[97]:
       catA catB       numC
count    24   24  24.000000
unique    2    4        NaN
top     foo    c        NaN
freq     16    6        NaN
mean    NaN  NaN  11.500000
std     NaN  NaN   7.071068
min     NaN  NaN   0.000000
25%     NaN  NaN   5.750000
50%     NaN  NaN  11.500000
75%     NaN  NaN  17.250000
max     NaN  NaN  23.000000

[11 rows x 3 columns]
```

Requesting all columns is possible with the shorthand 'all'

```
In [98]: df.describe(include='all')
Out[98]:
       catA catB       numC       numD
count    24   24  24.000000  24.000000
unique    2    4        NaN        NaN
top     foo    c        NaN        NaN
freq     16    6        NaN        NaN
mean    NaN  NaN  11.500000  12.000000
std     NaN  NaN   7.071068   7.071068
min     NaN  NaN   0.000000   0.500000
25%     NaN  NaN   5.750000   6.250000
50%     NaN  NaN  11.500000  12.000000
75%     NaN  NaN  17.250000  17.750000
max     NaN  NaN  23.000000  23.500000

[11 rows x 4 columns]
```

Without those arguments, `describe` will behave as before, including only numerical columns or, if none are, only categorical columns. See also the *docs*

- Added `split` as an option to the `orient` argument in `pd.DataFrame.to_dict`. (GH7840)
- The `get_dummies` method can now be used on DataFrames. By default only categorical columns are encoded as 0's and 1's, while other columns are left untouched.

```
In [99]: df = pd.DataFrame({'A': ['a', 'b', 'a'], 'B': ['c', 'c', 'b'],
   ....:                    'C': [1, 2, 3]})
   ....:

In [100]: pd.get_dummies(df)
Out[100]:
   C  A_a  A_b  B_b  B_c
0  1    1    0    0    1
1  2    0    1    0    1
2  3    1    0    1    0

[3 rows x 5 columns]
```

- `PeriodIndex` supports `resolution` as the same as `DatetimeIndex` (GH7708)

- `pandas.tseries.holiday` has added support for additional holidays and ways to observe holidays (GH7070)
- `pandas.tseries.holiday.Holiday` now supports a list of offsets in Python3 (GH7070)
- `pandas.tseries.holiday.Holiday` now supports a days_of_week parameter (GH7070)
- `GroupBy.nth()` now supports selecting multiple nth values (GH7910)

```
In [101]: business_dates = pd.date_range(start='4/1/2014', end='6/30/2014', freq=
↪'B')

In [102]: df = pd.DataFrame(1, index=business_dates, columns=['a', 'b'])

# get the first, 4th, and last date index for each month
In [103]: df.groupby([df.index.year, df.index.month]).nth([0, 3, -1])
Out[103]:
        a  b
2014 4  1  1
     4  1  1
     4  1  1
     5  1  1
     5  1  1
     5  1  1
     6  1  1
     6  1  1
     6  1  1

[9 rows x 2 columns]
```

- `Period` and `PeriodIndex` supports addition/subtraction with `timedelta`-likes (GH7966)

  If `Period` freq is `D`, `H`, `T`, `S`, `L`, `U`, `N`, `Timedelta`-like can be added if the result can have same freq. Otherwise, only the same `offsets` can be added.

```
In [104]: idx = pd.period_range('2014-07-01 09:00', periods=5, freq='H')

In [105]: idx
Out[105]:
PeriodIndex(['2014-07-01 09:00', '2014-07-01 10:00', '2014-07-01 11:00',
             '2014-07-01 12:00', '2014-07-01 13:00'],
            dtype='period[H]', freq='H')

In [106]: idx + pd.offsets.Hour(2)
Out[106]:
PeriodIndex(['2014-07-01 11:00', '2014-07-01 12:00', '2014-07-01 13:00',
             '2014-07-01 14:00', '2014-07-01 15:00'],
            dtype='period[H]', freq='H')

In [107]: idx + pd.Timedelta('120m')
Out[107]:
PeriodIndex(['2014-07-01 11:00', '2014-07-01 12:00', '2014-07-01 13:00',
             '2014-07-01 14:00', '2014-07-01 15:00'],
            dtype='period[H]', freq='H')

In [108]: idx = pd.period_range('2014-07', periods=5, freq='M')

In [109]: idx
Out[109]: PeriodIndex(['2014-07', '2014-08', '2014-09', '2014-10', '2014-11'],␣
↪dtype='period[M]', freq='M')
```

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```
In [110]: idx + pd.offsets.MonthEnd(3)
Out[110]: PeriodIndex(['2014-10', '2014-11', '2014-12', '2015-01', '2015-02'],␣
→dtype='period[M]', freq='M')
```

- Added experimental compatibility with `openpyxl` for versions >= 2.0. The `DataFrame.to_excel` method `engine` keyword now recognizes `openpyxl1` and `openpyxl2` which will explicitly require openpyxl v1 and v2 respectively, failing if the requested version is not available. The `openpyxl` engine is a now a meta-engine that automatically uses whichever version of openpyxl is installed. (GH7177)
- `DataFrame.fillna` can now accept a `DataFrame` as a fill value (GH8377)
- Passing multiple levels to *`stack()`* will now work when multiple level numbers are passed (GH7660). See *Reshaping by stacking and unstacking*.
- `set_names()`, `set_labels()`, and `set_levels()` methods now take an optional `level` keyword argument to all modification of specific level(s) of a MultiIndex. Additionally `set_names()` now accepts a scalar string value when operating on an `Index` or on a specific level of a `MultiIndex` (GH7792)

```
In [111]: idx = pd.MultiIndex.from_product([['a'], range(3), list("pqr")],
   .....:                                  names=['foo', 'bar', 'baz'])
   .....:

In [112]: idx.set_names('qux', level=0)
Out[112]:
MultiIndex([('a', 0, 'p'),
            ('a', 0, 'q'),
            ('a', 0, 'r'),
            ('a', 1, 'p'),
            ('a', 1, 'q'),
            ('a', 1, 'r'),
            ('a', 2, 'p'),
            ('a', 2, 'q'),
            ('a', 2, 'r')],
           names=['qux', 'bar', 'baz'])

In [113]: idx.set_names(['qux', 'corge'], level=[0, 1])
Out[113]:
MultiIndex([('a', 0, 'p'),
            ('a', 0, 'q'),
            ('a', 0, 'r'),
            ('a', 1, 'p'),
            ('a', 1, 'q'),
            ('a', 1, 'r'),
            ('a', 2, 'p'),
            ('a', 2, 'q'),
            ('a', 2, 'r')],
           names=['qux', 'corge', 'baz'])

In [114]: idx.set_levels(['a', 'b', 'c'], level='bar')
Out[114]:
MultiIndex([('a', 'a', 'p'),
            ('a', 'a', 'q'),
            ('a', 'a', 'r'),
            ('a', 'b', 'p'),
            ('a', 'b', 'q'),
            ('a', 'b', 'r'),
```

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```
            ('a', 'c', 'p'),
            ('a', 'c', 'q'),
            ('a', 'c', 'r')],
           names=['foo', 'bar', 'baz'])

In [115]: idx.set_levels([['a', 'b', 'c'], [1, 2, 3]], level=[1, 2])
Out[115]:
MultiIndex([('a', 'a', 1),
            ('a', 'a', 2),
            ('a', 'a', 3),
            ('a', 'b', 1),
            ('a', 'b', 2),
            ('a', 'b', 3),
            ('a', 'c', 1),
            ('a', 'c', 2),
            ('a', 'c', 3)],
           names=['foo', 'bar', 'baz'])
```

- `Index.isin` now supports a `level` argument to specify which index level to use for membership tests (GH7892, GH7890)

```
In [1]: idx = pd.MultiIndex.from_product([[0, 1], ['a', 'b', 'c']])

In [2]: idx.values
Out[2]: array([(0, 'a'), (0, 'b'), (0, 'c'), (1, 'a'), (1, 'b'), (1, 'c')],␣
↪dtype=object)

In [3]: idx.isin(['a', 'c', 'e'], level=1)
Out[3]: array([ True, False,  True,  True, False,  True], dtype=bool)
```

- `Index` now supports `duplicated` and `drop_duplicates`. (GH4060)

```
In [116]: idx = pd.Index([1, 2, 3, 4, 1, 2])

In [117]: idx
Out[117]: Int64Index([1, 2, 3, 4, 1, 2], dtype='int64')

In [118]: idx.duplicated()
Out[118]: array([False, False, False, False,  True,  True])

In [119]: idx.drop_duplicates()
Out[119]: Int64Index([1, 2, 3, 4], dtype='int64')
```

- add `copy=True` argument to `pd.concat` to enable pass through of complete blocks (GH8252)
- Added support for numpy 1.8+ data types (`bool_`, `int_`, `float_`, `string_`) for conversion to R dataframe (GH8400)

Performance

- Performance improvements in `DatetimeIndex.__iter__` to allow faster iteration (GH7683)
- Performance improvements in `Period` creation (and `PeriodIndex` setitem) (GH5155)
- Improvements in Series.transform for significant performance gains (revised) (GH6496)
- Performance improvements in `StataReader` when reading large files (GH8040, GH8073)
- Performance improvements in `StataWriter` when writing large files (GH8079)
- Performance and memory usage improvements in multi-key `groupby` (GH8128)
- Performance improvements in groupby `.agg` and `.apply` where builtins max/min were not mapped to numpy/cythonized versions (GH7722)
- Performance improvement in writing to sql (`to_sql`) of up to 50% (GH8208).
- Performance benchmarking of groupby for large value of ngroups (GH6787)
- Performance improvement in `CustomBusinessDay`, `CustomBusinessMonth` (GH8236)
- Performance improvement for `MultiIndex.values` for multi-level indexes containing datetimes (GH8543)

Bug fixes

- Bug in pivot_table, when using margins and a dict aggfunc (GH8349)
- Bug in `read_csv` where `squeeze=True` would return a view (GH8217)
- Bug in checking of table name in `read_sql` in certain cases (GH7826).
- Bug in `DataFrame.groupby` where `Grouper` does not recognize level when frequency is specified (GH7885)
- Bug in multiindexes dtypes getting mixed up when DataFrame is saved to SQL table (GH8021)
- Bug in `Series` 0-division with a float and integer operand dtypes (GH7785)
- Bug in `Series.astype("unicode")` not calling `unicode` on the values correctly (GH7758)
- Bug in `DataFrame.as_matrix()` with mixed `datetime64[ns]` and `timedelta64[ns]` dtypes (GH7778)
- Bug in `HDFStore.select_column()` not preserving UTC timezone info when selecting a `DatetimeIndex` (GH7777)
- Bug in `to_datetime` when `format='%Y%m%d'` and `coerce=True` are specified, where previously an object array was returned (rather than a coerced time-series with `NaT`), (GH7930)
- Bug in `DatetimeIndex` and `PeriodIndex` in-place addition and subtraction cause different result from normal one (GH6527)
- Bug in adding and subtracting `PeriodIndex` with `PeriodIndex` raise `TypeError` (GH7741)
- Bug in `combine_first` with `PeriodIndex` data raises `TypeError` (GH3367)
- Bug in MultiIndex slicing with missing indexers (GH7866)
- Bug in MultiIndex slicing with various edge cases (GH8132)
- Regression in MultiIndex indexing with a non-scalar type object (GH7914)
- Bug in `Timestamp` comparisons with `==` and `int64` dtype (GH8058)

- Bug in pickles contains `DateOffset` may raise `AttributeError` when `normalize` attribute is referred internally (GH7748)
- Bug in `Panel` when using `major_xs` and `copy=False` is passed (deprecation warning fails because of missing `warnings`) (GH8152).
- Bug in pickle deserialization that failed for pre-0.14.1 containers with dup items trying to avoid ambiguity when matching block and manager items, when there's only one block there's no ambiguity (GH7794)
- Bug in putting a `PeriodIndex` into a `Series` would convert to `int64` dtype, rather than `object` of `Periods` (GH7932)
- Bug in `HDFStore` iteration when passing a where (GH8014)
- Bug in `DataFrameGroupby.transform` when transforming with a passed non-sorted key (GH8046, GH8430)
- Bug in repeated timeseries line and area plot may result in `ValueError` or incorrect kind (GH7733)
- Bug in inference in a `MultiIndex` with `datetime.date` inputs (GH7888)
- Bug in `get` where an `IndexError` would not cause the default value to be returned (GH7725)
- Bug in `offsets.apply`, `rollforward` and `rollback` may reset nanosecond (GH7697)
- Bug in `offsets.apply`, `rollforward` and `rollback` may raise `AttributeError` if `Timestamp` has `dateutil` tzinfo (GH7697)
- Bug in sorting a MultiIndex frame with a `Float64Index` (GH8017)
- Bug in inconsistent panel setitem with a rhs of a `DataFrame` for alignment (GH7763)
- Bug in `is_superperiod` and `is_subperiod` cannot handle higher frequencies than `S` (GH7760, GH7772, GH7803)
- Bug in 32-bit platforms with `Series.shift` (GH8129)
- Bug in `PeriodIndex.unique` returns int64 `np.ndarray` (GH7540)
- Bug in `groupby.apply` with a non-affecting mutation in the function (GH8467)
- Bug in `DataFrame.reset_index` which has `MultiIndex` contains `PeriodIndex` or `DatetimeIndex` with tz raises `ValueError` (GH7746, GH7793)
- Bug in `DataFrame.plot` with `subplots=True` may draw unnecessary minor xticks and yticks (GH7801)
- Bug in `StataReader` which did not read variable labels in 117 files due to difference between Stata documentation and implementation (GH7816)
- Bug in `StataReader` where strings were always converted to 244 characters-fixed width irrespective of underlying string size (GH7858)
- Bug in `DataFrame.plot` and `Series.plot` may ignore `rot` and `fontsize` keywords (GH7844)
- Bug in `DatetimeIndex.value_counts` doesn't preserve tz (GH7735)
- Bug in `PeriodIndex.value_counts` results in `Int64Index` (GH7735)
- Bug in `DataFrame.join` when doing left join on index and there are multiple matches (GH5391)
- Bug in `GroupBy.transform()` where int groups with a transform that didn't preserve the index were incorrectly truncated (GH7972).
- Bug in `groupby` where callable objects without name attributes would take the wrong path, and produce a `DataFrame` instead of a `Series` (GH7929)
- Bug in `groupby` error message when a DataFrame grouping column is duplicated (GH7511)

- Bug in `read_html` where the `infer_types` argument forced coercion of date-likes incorrectly (GH7762, GH7032).
- Bug in `Series.str.cat` with an index which was filtered as to not include the first item (GH7857)
- Bug in `Timestamp` cannot parse `nanosecond` from string (GH7878)
- Bug in `Timestamp` with string offset and `tz` results incorrect (GH7833)
- Bug in `tslib.tz_convert` and `tslib.tz_convert_single` may return different results (GH7798)
- Bug in `DatetimeIndex.intersection` of non-overlapping timestamps with tz raises `IndexError` (GH7880)
- Bug in alignment with TimeOps and non-unique indexes (GH8363)
- Bug in `GroupBy.filter()` where fast path vs. slow path made the filter return a non scalar value that appeared valid but wasn't (GH7870).
- Bug in `date_range()`/`DatetimeIndex()` when the timezone was inferred from input dates yet incorrect times were returned when crossing DST boundaries (GH7835, GH7901).
- Bug in `to_excel()` where a negative sign was being prepended to positive infinity and was absent for negative infinity (GH7949)
- Bug in area plot draws legend with incorrect `alpha` when `stacked=True` (GH8027)
- `Period` and `PeriodIndex` addition/subtraction with `np.timedelta64` results in incorrect internal representations (GH7740)
- Bug in `Holiday` with no offset or observance (GH7987)
- Bug in `DataFrame.to_latex` formatting when columns or index is a `MultiIndex` (GH7982).
- Bug in `DateOffset` around Daylight Savings Time produces unexpected results (GH5175).
- Bug in `DataFrame.shift` where empty columns would throw `ZeroDivisionError` on numpy 1.7 (GH8019)
- Bug in installation where `html_encoding/*.html` wasn't installed and therefore some tests were not running correctly (GH7927).
- Bug in `read_html` where `bytes` objects were not tested for in `_read` (GH7927).
- Bug in `DataFrame.stack()` when one of the column levels was a datelike (GH8039)
- Bug in broadcasting numpy scalars with `DataFrame` (GH8116)
- Bug in `pivot_table` performed with nameless `index` and `columns` raises `KeyError` (GH8103)
- Bug in `DataFrame.plot(kind='scatter')` draws points and errorbars with different colors when the color is specified by `c` keyword (GH8081)
- Bug in `Float64Index` where `iat` and `at` were not testing and were failing (GH8092).
- Bug in `DataFrame.boxplot()` where y-limits were not set correctly when producing multiple axes (GH7528, GH5517).
- Bug in `read_csv` where line comments were not handled correctly given a custom line terminator or `delim_whitespace=True` (GH8122).
- Bug in `read_html` where empty tables caused a `StopIteration` (GH7575)
- Bug in casting when setting a column in a same-dtype block (GH7704)
- Bug in accessing groups from a `GroupBy` when the original grouper was a tuple (GH8121).
- Bug in `.at` that would accept integer indexers on a non-integer index and do fallback (GH7814)

- Bug with kde plot and NaNs (GH8182)
- Bug in `GroupBy.count` with float32 data type were nan values were not excluded (GH8169).
- Bug with stacked barplots and NaNs (GH8175).
- Bug in resample with non evenly divisible offsets (e.g. '7s') (GH8371)
- Bug in interpolation methods with the `limit` keyword when no values needed interpolating (GH7173).
- Bug where `col_space` was ignored in `DataFrame.to_string()` when `header=False` (GH8230).
- Bug with `DatetimeIndex.asof` incorrectly matching partial strings and returning the wrong date (GH8245).
- Bug in plotting methods modifying the global matplotlib rcParams (GH8242).
- Bug in `DataFrame.__setitem__` that caused errors when setting a dataframe column to a sparse array (GH8131)
- Bug where `Dataframe.boxplot()` failed when entire column was empty (GH8181).
- Bug with messed variables in `radviz` visualization (GH8199).
- Bug in interpolation methods with the `limit` keyword when no values needed interpolating (GH7173).
- Bug where `col_space` was ignored in `DataFrame.to_string()` when `header=False` (GH8230).
- Bug in `to_clipboard` that would clip long column data (GH8305)
- Bug in `DataFrame` terminal display: Setting max_column/max_rows to zero did not trigger auto-resizing of dfs to fit terminal width/height (GH7180).
- Bug in OLS where running with "cluster" and "nw_lags" parameters did not work correctly, but also did not throw an error (GH5884).
- Bug in `DataFrame.dropna` that interpreted non-existent columns in the subset argument as the 'last column' (GH8303)
- Bug in `Index.intersection` on non-monotonic non-unique indexes (GH8362).
- Bug in masked series assignment where mismatching types would break alignment (GH8387)
- Bug in `NDFrame.equals` gives false negatives with dtype=object (GH8437)
- Bug in assignment with indexer where type diversity would break alignment (GH8258)
- Bug in `NDFrame.loc` indexing when row/column names were lost when target was a list/ndarray (GH6552)
- Regression in `NDFrame.loc` indexing when rows/columns were converted to Float64Index if target was an empty list/ndarray (GH7774)
- Bug in `Series` that allows it to be indexed by a `DataFrame` which has unexpected results. Such indexing is no longer permitted (GH8444)
- Bug in item assignment of a `DataFrame` with MultiIndex columns where right-hand-side columns were not aligned (GH7655)
- Suppress FutureWarning generated by NumPy when comparing object arrays containing NaN for equality (GH7065)
- Bug in `DataFrame.eval()` where the dtype of the `not` operator (~) was not correctly inferred as `bool`.

Contributors

A total of 80 people contributed patches to this release. People with a "+" by their names contributed a patch for the first time.

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- Adam Greenhall
- Andy Hayden
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- Benjamin Thyreau +
- BorisVerk +
- Chris Reynolds +
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- DSM
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- FragLegs +
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- ischwabacher
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- jnmclarty +
- jreback
- klonuo +
- lexual
- mcjcode +
- mtrbean +
- onesandzeroes

- rockg
- seth-p
- sinhrks
- someben +
- stahlous +
- stas-sl +
- thatneat +
- tom-alcorn +
- unknown
- unutbu
- zachcp +

5.13 Version 0.14

5.13.1 v0.14.1 (July 11, 2014)

This is a minor release from 0.14.0 and includes a small number of API changes, several new features, enhancements, and performance improvements along with a large number of bug fixes. We recommend that all users upgrade to this version.

- Highlights include:
  - New methods `select_dtypes()` to select columns based on the dtype and `sem()` to calculate the standard error of the mean.
  - Support for dateutil timezones (see *docs*).
  - Support for ignoring full line comments in the `read_csv()` text parser.
  - New documentation section on *Options and Settings*.
  - Lots of bug fixes.
- *Enhancements*
- *API Changes*
- *Performance Improvements*
- *Experimental Changes*
- *Bug Fixes*

API changes

- Openpyxl now raises a ValueError on construction of the openpyxl writer instead of warning on pandas import (GH7284).
- For `StringMethods.extract`, when no match is found, the result - only containing `NaN` values - now also has `dtype=object` instead of `float` (GH7242)
- `Period` objects no longer raise a `TypeError` when compared using `==` with another object that *isn't* a `Period`. Instead when comparing a `Period` with another object using `==` if the other object isn't a `Period` `False` is returned. (GH7376)
- Previously, the behaviour on resetting the time or not in `offsets.apply`, `rollforward` and `rollback` operations differed between offsets. With the support of the `normalize` keyword for all offsets(see below) with a default value of False (preserve time), the behaviour changed for certain offsets (BusinessMonthBegin, MonthEnd, BusinessMonthEnd, CustomBusinessMonthEnd, BusinessYearBegin, LastWeekOfMonth, FY5253Quarter, LastWeekOfMonth, Easter):

```
In [6]: from pandas.tseries import offsets

In [7]: d = pd.Timestamp('2014-01-01 09:00')

# old behaviour < 0.14.1
In [8]: d + offsets.MonthEnd()
Out[8]: pd.Timestamp('2014-01-31 00:00:00')
```

  Starting from 0.14.1 all offsets preserve time by default. The old behaviour can be obtained with `normalize=True`

```
# new behaviour
In [1]: d + offsets.MonthEnd()
Out[1]: Timestamp('2014-01-31 09:00:00')

In [2]: d + offsets.MonthEnd(normalize=True)
Out[2]: Timestamp('2014-01-31 00:00:00')
```

  Note that for the other offsets the default behaviour did not change.

- Add back `#N/A N/A` as a default NA value in text parsing, (regression from 0.12) (GH5521)
- Raise a `TypeError` on inplace-setting with a `.where` and a non `np.nan` value as this is inconsistent with a set-item expression like `df[mask] = None` (GH7656)

Enhancements

- Add `dropna` argument to `value_counts` and `nunique` (GH5569).
- Add *`select_dtypes()`* method to allow selection of columns based on dtype (GH7316). See *the docs*.
- All `offsets` supports the `normalize` keyword to specify whether `offsets.apply`, `rollforward` and `rollback` resets the time (hour, minute, etc) or not (default `False`, preserves time) (GH7156):

```
import pandas.tseries.offsets as offsets

day = offsets.Day()
day.apply(pd.Timestamp('2014-01-01 09:00'))

day = offsets.Day(normalize=True)
day.apply(pd.Timestamp('2014-01-01 09:00'))
```

- `PeriodIndex` is represented as the same format as `DatetimeIndex` (GH7601)
- `StringMethods` now work on empty Series (GH7242)
- The file parsers `read_csv` and `read_table` now ignore line comments provided by the parameter *comment*, which accepts only a single character for the C reader. In particular, they allow for comments before file data begins (GH2685)
- Add `NotImplementedError` for simultaneous use of `chunksize` and `nrows` for read_csv() (GH6774).
- Tests for basic reading of public S3 buckets now exist (GH7281).
- `read_html` now sports an `encoding` argument that is passed to the underlying parser library. You can use this to read non-ascii encoded web pages (GH7323).
- `read_excel` now supports reading from URLs in the same way that `read_csv` does. (GH6809)
- Support for dateutil timezones, which can now be used in the same way as pytz timezones across pandas. (GH4688)

```
In [3]: rng = pd.date_range('3/6/2012 00:00', periods=10, freq='D',
   ...:                       tz='dateutil/Europe/London')
   ...:

In [4]: rng.tz
Out[4]: tzfile('/usr/share/zoneinfo/Europe/London')
```

  See *the docs*.

- Implemented `sem` (standard error of the mean) operation for `Series`, `DataFrame`, `Panel`, and `Groupby` (GH6897)
- Add `nlargest` and `nsmallest` to the `Series` `groupby` whitelist, which means you can now use these methods on a `SeriesGroupBy` object (GH7053).
- All offsets `apply`, `rollforward` and `rollback` can now handle `np.datetime64`, previously results in `ApplyTypeError` (GH7452)
- `Period` and `PeriodIndex` can contain `NaT` in its values (GH7485)
- Support pickling `Series`, `DataFrame` and `Panel` objects with non-unique labels along *item* axis (`index`, `columns` and `items` respectively) (GH7370).
- Improved inference of datetime/timedelta with mixed null objects. Regression from 0.13.1 in interpretation of an object Index with all null elements (GH7431)

Performance

- Improvements in dtype inference for numeric operations involving yielding performance gains for dtypes: `int64`, `timedelta64`, `datetime64` (GH7223)
- Improvements in Series.transform for significant performance gains (GH6496)
- Improvements in DataFrame.transform with ufuncs and built-in grouper functions for significant performance gains (GH7383)
- Regression in groupby aggregation of datetime64 dtypes (GH7555)
- Improvements in *MultiIndex.from_product* for large iterables (GH7627)

Experimental

- `pandas.io.data.Options` has a new method, `get_all_data` method, and now consistently returns a MultiIndexed `DataFrame` (GH5602)
- `io.gbq.read_gbq` and `io.gbq.to_gbq` were refactored to remove the dependency on the Google `bq.py` command line client. This submodule now uses `httplib2` and the Google `apiclient` and `oauth2client` API client libraries which should be more stable and, therefore, reliable than `bq.py`. See *the docs*. (GH6937).

Bug fixes

- Bug in `DataFrame.where` with a symmetric shaped frame and a passed other of a DataFrame (GH7506)
- Bug in Panel indexing with a MultiIndex axis (GH7516)
- Regression in datetimelike slice indexing with a duplicated index and non-exact end-points (GH7523)
- Bug in setitem with list-of-lists and single vs mixed types (GH7551:)
- Bug in time ops with non-aligned Series (GH7500)
- Bug in timedelta inference when assigning an incomplete Series (GH7592)
- Bug in groupby `.nth` with a Series and integer-like column name (GH7559)
- Bug in `Series.get` with a boolean accessor (GH7407)
- Bug in `value_counts` where `NaT` did not qualify as missing (`NaN`) (GH7423)
- Bug in `to_timedelta` that accepted invalid units and misinterpreted 'm/h' (GH7611, GH6423)
- Bug in line plot doesn't set correct `xlim` if `secondary_y=True` (GH7459)
- Bug in grouped `hist` and `scatter` plots use old `figsize` default (GH7394)
- Bug in plotting subplots with `DataFrame.plot`, `hist` clears passed `ax` even if the number of subplots is one (GH7391).
- Bug in plotting subplots with `DataFrame.boxplot` with `by` kw raises `ValueError` if the number of subplots exceeds 1 (GH7391).
- Bug in subplots displays `ticklabels` and `labels` in different rule (GH5897)
- Bug in `Panel.apply` with a MultiIndex as an axis (GH7469)
- Bug in `DatetimeIndex.insert` doesn't preserve `name` and `tz` (GH7299)
- Bug in `DatetimeIndex.asobject` doesn't preserve `name` (GH7299)
- Bug in MultiIndex slicing with datetimelike ranges (strings and Timestamps), (GH7429)
- Bug in `Index.min` and `max` doesn't handle `nan` and `NaT` properly (GH7261)
- Bug in `PeriodIndex.min/max` results in `int` (GH7609)
- Bug in `resample` where `fill_method` was ignored if you passed `how` (GH2073)
- Bug in `TimeGrouper` doesn't exclude column specified by `key` (GH7227)
- Bug in `DataFrame` and `Series` bar and barh plot raises `TypeError` when `bottom` and `left` keyword is specified (GH7226)
- Bug in `DataFrame.hist` raises `TypeError` when it contains non numeric column (GH7277)
- Bug in `Index.delete` does not preserve `name` and `freq` attributes (GH7302)

- Bug in `DataFrame.query()`/`eval` where local string variables with the @ sign were being treated as temporaries attempting to be deleted (GH7300).
- Bug in `Float64Index` which didn't allow duplicates (GH7149).
- Bug in `DataFrame.replace()` where truthy values were being replaced (GH7140).
- Bug in `StringMethods.extract()` where a single match group Series would use the matcher's name instead of the group name (GH7313).
- Bug in `isnull()` when `mode.use_inf_as_null == True` where isnull wouldn't test `True` when it encountered an `inf`/`-inf` (GH7315).
- Bug in inferred_freq results in None for eastern hemisphere timezones (GH7310)
- Bug in `Easter` returns incorrect date when offset is negative (GH7195)
- Bug in broadcasting with `.div`, integer dtypes and divide-by-zero (GH7325)
- Bug in `CustomBusinessDay.apply` raises `NameError` when `np.datetime64` object is passed (GH7196)
- Bug in `MultiIndex.append`, `concat` and `pivot_table` don't preserve timezone (GH6606)
- Bug in `.loc` with a list of indexers on a single-multi index level (that is not nested) (GH7349)
- Bug in `Series.map` when mapping a dict with tuple keys of different lengths (GH7333)
- Bug all `StringMethods` now work on empty Series (GH7242)
- Fix delegation of *read_sql* to *read_sql_query* when query does not contain 'select' (GH7324).
- Bug where a string column name assignment to a `DataFrame` with a `Float64Index` raised a `TypeError` during a call to `np.isnan` (GH7366).
- Bug where `NDFrame.replace()` didn't correctly replace objects with `Period` values (GH7379).
- Bug in `.ix` getitem should always return a Series (GH7150)
- Bug in MultiIndex slicing with incomplete indexers (GH7399)
- Bug in MultiIndex slicing with a step in a sliced level (GH7400)
- Bug where negative indexers in `DatetimeIndex` were not correctly sliced (GH7408)
- Bug where `NaT` wasn't repr'd correctly in a `MultiIndex` (GH7406, GH7409).
- Bug where bool objects were converted to `nan` in `convert_objects` (GH7416).
- Bug in `quantile` ignoring the axis keyword argument (GH7306)
- Bug where `nanops._maybe_null_out` doesn't work with complex numbers (GH7353)
- Bug in several `nanops` functions when `axis==0` for 1-dimensional `nan` arrays (GH7354)
- Bug where `nanops.nanmedian` doesn't work when `axis==None` (GH7352)
- Bug where `nanops._has_infs` doesn't work with many dtypes (GH7357)
- Bug in `StataReader.data` where reading a 0-observation dta failed (GH7369)
- Bug in `StataReader` when reading Stata 13 (117) files containing fixed width strings (GH7360)
- Bug in `StataWriter` where encoding was ignored (GH7286)
- Bug in `DatetimeIndex` comparison doesn't handle `NaT` properly (GH7529)
- Bug in passing input with `tzinfo` to some offsets `apply`, `rollforward` or `rollback` resets `tzinfo` or raises `ValueError` (GH7465)

- Bug in `DatetimeIndex.to_period`, `PeriodIndex.asobject`, `PeriodIndex.to_timestamp` doesn't preserve `name` (GH7485)
- Bug in `DatetimeIndex.to_period` and `PeriodIndex.to_timestamp` handle `NaT` incorrectly (GH7228)
- Bug in `offsets.apply`, `rollforward` and `rollback` may return normal `datetime` (GH7502)
- Bug in `resample` raises `ValueError` when target contains `NaT` (GH7227)
- Bug in `Timestamp.tz_localize` resets `nanosecond` info (GH7534)
- Bug in `DatetimeIndex.asobject` raises `ValueError` when it contains `NaT` (GH7539)
- Bug in `Timestamp.__new__` doesn't preserve nanosecond properly (GH7610)
- Bug in `Index.astype(float)` where it would return an `object` dtype `Index` (GH7464).
- Bug in `DataFrame.reset_index` loses `tz` (GH3950)
- Bug in `DatetimeIndex.freqstr` raises `AttributeError` when `freq` is `None` (GH7606)
- Bug in `GroupBy.size` created by `TimeGrouper` raises `AttributeError` (GH7453)
- Bug in single column bar plot is misaligned (GH7498).
- Bug in area plot with tz-aware time series raises `ValueError` (GH7471)
- Bug in non-monotonic `Index.union` may preserve `name` incorrectly (GH7458)
- Bug in `DatetimeIndex.intersection` doesn't preserve timezone (GH4690)
- Bug in `rolling_var` where a window larger than the array would raise an error(GH7297)
- Bug with last plotted timeseries dictating `xlim` (GH2960)
- Bug with `secondary_y` axis not being considered for timeseries `xlim` (GH3490)
- Bug in `Float64Index` assignment with a non scalar indexer (GH7586)
- Bug in `pandas.core.strings.str_contains` does not properly match in a case insensitive fashion when `regex=False` and `case=False` (GH7505)
- Bug in `expanding_cov`, `expanding_corr`, `rolling_cov`, and `rolling_corr` for two arguments with mismatched index (GH7512)
- Bug in `to_sql` taking the boolean column as text column (GH7678)
- Bug in grouped *hist* doesn't handle *rot* kw and *sharex* kw properly (GH7234)
- Bug in `.loc` performing fallback integer indexing with `object` dtype indices (GH7496)
- Bug (regression) in `PeriodIndex` constructor when passed `Series` objects (GH7701).

Contributors

A total of 46 people contributed patches to this release. People with a "+" by their names contributed a patch for the first time.

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- Andy Hayden
- Benjamin Adams +
- Benjamin M. Gross +
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- clham
- dsm054 +
- helger +
- immerrr
- jaimefrio
- jreback
- lexual
- onesandzeroes
- rockg

- sanguineturtle +
- seth-p +
- sinhrks
- unknown
- yelite +

5.13.2 v0.14.0 (May 31 , 2014)

This is a major release from 0.13.1 and includes a small number of API changes, several new features, enhancements, and performance improvements along with a large number of bug fixes. We recommend that all users upgrade to this version.

- Highlights include:
  - Officially support Python 3.4
  - SQL interfaces updated to use `sqlalchemy`, See *Here*.
  - Display interface changes, See *Here*
  - MultiIndexing Using Slicers, See *Here*.
  - Ability to join a singly-indexed DataFrame with a MultiIndexed DataFrame, see *Here*
  - More consistency in groupby results and more flexible groupby specifications, See *Here*
  - Holiday calendars are now supported in `CustomBusinessDay`, see *Here*
  - Several improvements in plotting functions, including: hexbin, area and pie plots, see *Here*.
  - Performance doc section on I/O operations, See *Here*
- *Other Enhancements*
- *API Changes*
- *Text Parsing API Changes*
- *Groupby API Changes*
- *Performance Improvements*
- *Prior Deprecations*
- *Deprecations*
- *Known Issues*
- *Bug Fixes*

Warning: In 0.14.0 all `NDFrame` based containers have undergone significant internal refactoring. Before that each block of homogeneous data had its own labels and extra care was necessary to keep those in sync with the parent container's labels. This should not have any visible user/API behavior changes (GH6745)

API changes

- `read_excel` uses 0 as the default sheet (GH6573)
- `iloc` will now accept out-of-bounds indexers for slices, e.g. a value that exceeds the length of the object being indexed. These will be excluded. This will make pandas conform more with python/numpy indexing of out-of-bounds values. A single indexer that is out-of-bounds and drops the dimensions of the object will still raise `IndexError` (GH6296, GH6299). This could result in an empty axis (e.g. an empty DataFrame being returned)

```
In [1]: dfl = pd.DataFrame(np.random.randn(5, 2), columns=list('AB'))

In [2]: dfl
Out[2]:
          A         B
0  0.469112 -0.282863
1 -1.509059 -1.135632
2  1.212112 -0.173215
3  0.119209 -1.044236
4 -0.861849 -2.104569

[5 rows x 2 columns]

In [3]: dfl.iloc[:, 2:3]
Out[3]:
Empty DataFrame
Columns: []
Index: [0, 1, 2, 3, 4]

[5 rows x 0 columns]

In [4]: dfl.iloc[:, 1:3]
Out[4]:
          B
0 -0.282863
1 -1.135632
2 -0.173215
3 -1.044236
4 -2.104569

[5 rows x 1 columns]

In [5]: dfl.iloc[4:6]
Out[5]:
          A         B
4 -0.861849 -2.104569

[1 rows x 2 columns]
```

These are out-of-bounds selections

```
>>> dfl.iloc[[4, 5, 6]]
IndexError: positional indexers are out-of-bounds

>>> dfl.iloc[:, 4]
IndexError: single positional indexer is out-of-bounds
```

- Slicing with negative start, stop & step values handles corner cases better (GH6531):

  - `df.iloc[:-len(df)]` is now empty
  - `df.iloc[len(df)::-1]` now enumerates all elements in reverse

- The *`DataFrame.interpolate()`* keyword `downcast` default has been changed from `infer` to `None`. This is to preserve the original dtype unless explicitly requested otherwise (GH6290).
- When converting a dataframe to HTML it used to return *Empty DataFrame*. This special case has been removed, instead a header with the column names is returned (GH6062).
- `Series` and `Index` now internally share more common operations, e.g. `factorize()`,`nunique()`, `value_counts()` are now supported on `Index` types as well. The `Series.weekday` property from is removed from Series for API consistency. Using a `DatetimeIndex/PeriodIndex` method on a Series will now raise a `TypeError`. (GH4551, GH4056, GH5519, GH6380, GH7206).
- Add `is_month_start`, `is_month_end`, `is_quarter_start`, `is_quarter_end`, `is_year_start`, `is_year_end` accessors for `DateTimeIndex / Timestamp` which return a boolean array of whether the timestamp(s) are at the start/end of the month/quarter/year defined by the frequency of the `DateTimeIndex` / `Timestamp` (GH4565, GH6998)
- Local variable usage has changed in *`pandas.eval()`*/*`DataFrame.eval()`*/*`DataFrame.query()`* (GH5987). For the *`DataFrame`* methods, two things have changed
  - Column names are now given precedence over locals
  - Local variables must be referred to explicitly. This means that even if you have a local variable that is *not* a column you must still refer to it with the `'@'` prefix.
  - You can have an expression like `df.query('@a < a')` with no complaints from `pandas` about ambiguity of the name `a`.
  - The top-level *`pandas.eval()`* function does not allow you use the `'@'` prefix and provides you with an error message telling you so.
  - `NameResolutionError` was removed because it isn't necessary anymore.
- Define and document the order of column vs index names in query/eval (GH6676)
- `concat` will now concatenate mixed Series and DataFrames using the Series name or numbering columns as needed (GH2385). See *the docs*
- Slicing and advanced/boolean indexing operations on `Index` classes as well as *`Index.delete()`* and *`Index.drop()`* methods will no longer change the type of the resulting index (GH6440, GH7040)

```
In [6]: i = pd.Index([1, 2, 3, 'a', 'b', 'c'])

In [7]: i[[0, 1, 2]]
Out[7]: Index([1, 2, 3], dtype='object')

In [8]: i.drop(['a', 'b', 'c'])
Out[8]: Index([1, 2, 3], dtype='object')
```

  Previously, the above operation would return `Int64Index`. If you'd like to do this manually, use *`Index.astype()`*

```
In [9]: i[[0, 1, 2]].astype(np.int_)
Out[9]: Int64Index([1, 2, 3], dtype='int64')
```

- `set_index` no longer converts MultiIndexes to an Index of tuples. For example, the old behavior returned an Index in this case (GH6459):

```
# Old behavior, casted MultiIndex to an Index
In [10]: tuple_ind
Out[10]: Index([('a', 'c'), ('a', 'd'), ('b', 'c'), ('b', 'd')], dtype='object')

In [11]: df_multi.set_index(tuple_ind)
Out[11]:
               0         1
(a, c)  0.471435 -1.190976
(a, d)  1.432707 -0.312652
(b, c) -0.720589  0.887163
(b, d)  0.859588 -0.636524

[4 rows x 2 columns]

# New behavior
In [12]: mi
Out[12]:
MultiIndex([('a', 'c'),
            ('a', 'd'),
            ('b', 'c'),
            ('b', 'd')],
           )

In [13]: df_multi.set_index(mi)
Out[13]:
            0         1
a c  0.471435 -1.190976
  d  1.432707 -0.312652
b c -0.720589  0.887163
  d  0.859588 -0.636524

[4 rows x 2 columns]
```

This also applies when passing multiple indices to `set_index`:

```
# Old output, 2-level MultiIndex of tuples
In [14]: df_multi.set_index([df_multi.index, df_multi.index])
Out[14]:
                      0         1
(a, c) (a, c)  0.471435 -1.190976
(a, d) (a, d)  1.432707 -0.312652
(b, c) (b, c) -0.720589  0.887163
(b, d) (b, d)  0.859588 -0.636524

[4 rows x 2 columns]

# New output, 4-level MultiIndex
In [15]: df_multi.set_index([df_multi.index, df_multi.index])
Out[15]:
                0         1
a c a c  0.471435 -1.190976
  d a d  1.432707 -0.312652
b c b c -0.720589  0.887163
  d b d  0.859588 -0.636524

[4 rows x 2 columns]
```

- `pairwise` keyword was added to the statistical moment functions `rolling_cov`, `rolling_corr`, ewmcov, ewmcorr, expanding_cov, expanding_corr to allow the calculation of moving window covariance and correlation matrices (GH4950). See *Computing rolling pairwise covariances and correlations* in the docs.

```
In [1]: df = pd.DataFrame(np.random.randn(10, 4), columns=list('ABCD'))

In [4]: covs = pd.rolling_cov(df[['A', 'B', 'C']],
   ....:                         df[['B', 'C', 'D']],
   ....:                         5,
   ....:                         pairwise=True)


In [5]: covs[df.index[-1]]
Out[5]:
          B         C         D
A  0.035310  0.326593 -0.505430
B  0.137748 -0.006888 -0.005383
C -0.006888  0.861040  0.020762
```

- Series.iteritems() is now lazy (returns an iterator rather than a list). This was the documented behavior prior to 0.14. (GH6760)
- Added nunique and value_counts functions to Index for counting unique elements. (GH6734)
- stack and unstack now raise a ValueError when the level keyword refers to a non-unique item in the Index (previously raised a KeyError). (GH6738)
- drop unused order argument from Series.sort; args now are in the same order as Series.order; add na_position arg to conform to Series.order (GH6847)
- default sorting algorithm for Series.order is now quicksort, to conform with Series.sort (and numpy defaults)
- add inplace keyword to Series.order/sort to make them inverses (GH6859)
- DataFrame.sort now places NaNs at the beginning or end of the sort according to the na_position parameter. (GH3917)
- accept TextFileReader in concat, which was affecting a common user idiom (GH6583), this was a regression from 0.13.1
- Added factorize functions to Index and Series to get indexer and unique values (GH7090)
- describe on a DataFrame with a mix of Timestamp and string like objects returns a different Index (GH7088). Previously the index was unintentionally sorted.
- Arithmetic operations with **only** bool dtypes now give a warning indicating that they are evaluated in Python space for +, -, and * operations and raise for all others (GH7011, GH6762, GH7015, GH7210)

```
>>> x = pd.Series(np.random.rand(10) > 0.5)
>>> y = True
>>> x + y  # warning generated: should do x | y instead
UserWarning: evaluating in Python space because the '+' operator is not
supported by numexpr for the bool dtype, use '|' instead
>>> x / y  # this raises because it doesn't make sense
NotImplementedError: operator '/' not implemented for bool dtypes
```

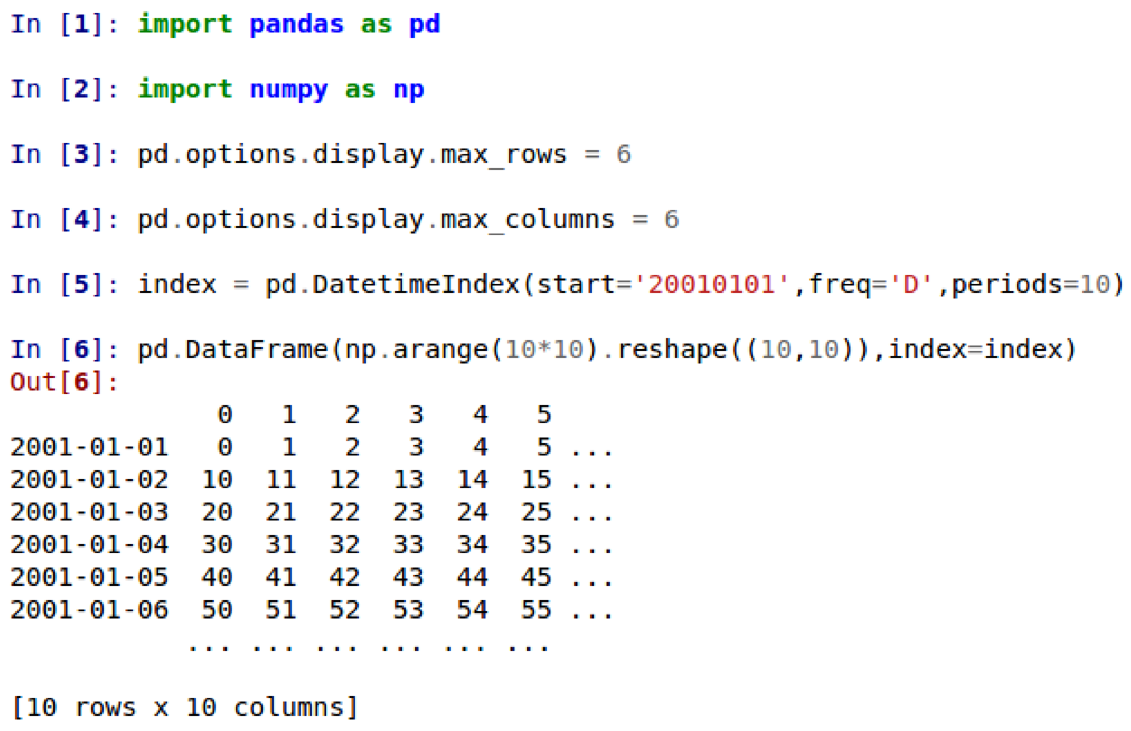
- In HDFStore, select_as_multiple will always raise a KeyError, when a key or the selector is not found (GH6177)
- df['col'] = value and df.loc[:,'col'] = value are now completely equivalent; previously the .loc would not necessarily coerce the dtype of the resultant series (GH6149)

- `dtypes` and `ftypes` now return a series with `dtype=object` on empty containers (GH5740)
- `df.to_csv` will now return a string of the CSV data if neither a target path nor a buffer is provided (GH6061)
- `pd.infer_freq()` will now raise a `TypeError` if given an invalid `Series/Index` type (GH6407, GH6463)
- A tuple passed to `DataFame.sort_index` will be interpreted as the levels of the index, rather than requiring a list of tuple (GH4370)
- all offset operations now return `Timestamp` types (rather than datetime), Business/Week frequencies were incorrect (GH4069)
- `to_excel` now converts `np.inf` into a string representation, customizable by the `inf_rep` keyword argument (Excel has no native inf representation) (GH6782)
- Replace `pandas.compat.scipy.scoreatpercentile` with `numpy.percentile` (GH6810)
- `.quantile` on a `datetime[ns]` series now returns `Timestamp` instead of `np.datetime64` objects (GH6810)
- change `AssertionError` to `TypeError` for invalid types passed to `concat` (GH6583)
- Raise a `TypeError` when `DataFrame` is passed an iterator as the `data` argument (GH5357)

Display changes

- The default way of printing large DataFrames has changed. DataFrames exceeding `max_rows` and/or `max_columns` are now displayed in a centrally truncated view, consistent with the printing of a *`pandas.Series`* (GH5603).

  In previous versions, a DataFrame was truncated once the dimension constraints were reached and an ellipse (…) signaled that part of the data was cut off.



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

In [2]: import numpy as np

In [3]: pd.options.display.max_rows = 6

In [4]: pd.options.display.max_columns = 6

In [5]: index = pd.DatetimeIndex(start='20010101',freq='D',periods=10)

In [6]: pd.DataFrame(np.arange(10*10).reshape((10,10)),index=index)
Out[6]:
             0   1   2   3   4   5
2001-01-01   0   1   2   3   4   5 ...
2001-01-02  10  11  12  13  14  15 ...
2001-01-03  20  21  22  23  24  25 ...
2001-01-04  30  31  32  33  34  35 ...
2001-01-05  40  41  42  43  44  45 ...
2001-01-06  50  51  52  53  54  55 ...
           ... ... ... ... ... ...

[10 rows x 10 columns]
```