Change Values- AM Peak

March 25, 2017

```
In [1]: %matplotlib inline
In [2]: import pandas as pd
In [3]: import numpy as np
In [4]: df = pd.read_excel('means_am_peak.xlsx', 'Sheet1')
In [5]: df
Out [5]:
                               Station
                                        Year Means AM Peak
        0
                         Addison Road
                                        2010
                                                 2182.925000
        1
                                   NaN
                                        2011
                                                 2193.325000
        2
                                   NaN
                                        2012
                                                 2077.500000
        3
                                        2013
                                   NaN
                                                 1995.433333
         4
                                        2014
                                                 1967.800000
                                   NaN
        5
                                        2010
                                                 3014.400000
                            Anacostia
        6
                                   NaN
                                        2011
                                                 3026.466667
        7
                                        2012
                                   NaN
                                                 2975.716667
        8
                                   NaN
                                        2013
                                                 2890.183333
        9
                                        2014
                                   NaN
                                                 2893.400000
        10
              Archives-Navy Memorial
                                        2010
                                                  347.375000
        11
                                   NaN
                                        2011
                                                  378.416667
        12
                                        2012
                                   {\tt NaN}
                                                  400.516667
        13
                                   NaN
                                        2013
                                                  389.083333
        14
                                   NaN
                                        2014
                                                  370.591667
        15
                  Arlington Cemetery
                                        2010
                                                   13.650000
                                        2011
        16
                                   \tt NaN
                                                    16.433333
                                        2012
        17
                                   NaN
                                                   17.075000
                                        2013
        18
                                   {\tt NaN}
                                                    14.425000
        19
                                   {\tt NaN}
                                        2014
                                                    16.333333
                                        2010
        20
                             Ballston
                                                 4412.925000
        21
                                        2011
                                                 4543.683333
                                   {\tt NaN}
                                        2012
        22
                                   NaN
                                                 4466.250000
        23
                                   NaN
                                        2013
                                                 4397.900000
        24
                                   NaN
                                        2014
                                                 4422.241667
        25
                         Benning Road
                                        2010
                                                 1581.100000
                                        2011
                                                 1557.808333
        26
                                   NaN
```

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27
                                   {\tt NaN}
                                        2012
                                                 1553.216667
                                        2013
        28
                                   NaN
                                                 1571.550000
        29
                                        2014
                                                 1583.316667
                                   \tt NaN
         . .
                                   . . .
                                         . . .
        409
                                   {\tt NaN}
                                        2012
                                                 1329.058333
        410
                                        2013
                                   NaN
                                                 1280.191667
        411
                                   NaN
                                        2014
                                                 1279.475000
        412
                   West Falls Church
                                        2010
                                                 6534.150000
        413
                                        2011
                                   NaN
                                                 6807.950000
        414
                                   NaN
                                        2012
                                                 6713.683333
                                        2013
        415
                                                 6521.550000
                                   \tt NaN
                                        2014
        416
                                   NaN
                                                 4637.383333
        417
                    West Hyattsville
                                        2010
                                                 2003.800000
                                        2011
        418
                                   NaN
                                                 2073.725000
                                        2012
        419
                                   NaN
                                                 2126.650000
        420
                                   NaN
                                        2013
                                                 2108.158333
        421
                                   NaN
                                        2014
                                                 2139.775000
        422
                                        2010
                              Wheaton
                                                 2160.450000
        423
                                        2011
                                                 2236.375000
                                   {\tt NaN}
        424
                                   NaN
                                        2012
                                                 2119.816667
        425
                                   NaN
                                        2013
                                                 2030.066667
        426
                                        2014
                                   NaN
                                                 2070.666667
        427
                          White Flint
                                        2010
                                                 1559.500000
        428
                                        2011
                                   NaN
                                                 1635.708333
        429
                                   NaN
                                        2012
                                                 1581.841667
                                        2013
                                                 1548.733333
        430
                                   \tt NaN
        431
                                        2014
                                   NaN
                                                 1538.941667
        432
                                Wiehle
                                        2013
                                                     3.366667
        433
                                        2014
                                   NaN
                                                 3721.714286
        434
                    Woodley Park-Zoo
                                        2010
                                                 2584.450000
        435
                                   NaN
                                        2011
                                                 2720.841667
        436
                                   NaN
                                        2012
                                                 2723.983333
        437
                                   NaN
                                        2013
                                                 2598.083333
        438
                                   NaN
                                        2014
                                                 2555.966667
         [439 rows x 3 columns]
In [6]: df['Station'] = pd.Series(df['Station']).fillna(method='ffill')
In [7]: df
Out [7]:
                              Station Year Means AM Peak
        0
                         Addison Road
                                        2010
                                                 2182.925000
        1
                         Addison Road
                                        2011
                                                 2193.325000
        2
                         Addison Road
                                        2012
                                                 2077.500000
        3
                         Addison Road
                                        2013
                                                 1995.433333
        4
                         Addison Road
                                        2014
                                                 1967.800000
```

3014.400000

2010

Anacostia

5

_		0044	0000 10000
6	Anacostia	2011	3026.466667
7	Anacostia	2012	2975.716667
8	Anacostia	2013	2890.183333
9	Anacostia	2014	2893.400000
10	Archives-Navy Memorial	2010	347.375000
11	Archives-Navy Memorial	2011	378.416667
12	Archives-Navy Memorial	2012	400.516667
13	Archives-Navy Memorial	2013	389.083333
14	Archives-Navy Memorial	2014	370.591667
15	Arlington Cemetery	2014	13.650000
	-		
16	Arlington Cemetery	2011	16.433333
17	Arlington Cemetery	2012	17.075000
18	Arlington Cemetery	2013	14.425000
19	Arlington Cemetery	2014	16.333333
20	Ballston	2010	4412.925000
21	Ballston	2011	4543.683333
22	Ballston	2012	4466.250000
23	Ballston	2013	4397.900000
24	Ballston	2014	4422.241667
25	Benning Road	2010	1581.100000
26	Benning Road	2011	1557.808333
27	Benning Road	2012	1553.216667
28	Benning Road	2013	1571.550000
29	Benning Road	2014	1583.316667
20	G		1000.010001
400		0010	1200 050222
409	Waterfront	2012	1329.058333
409 410	Waterfront Waterfront	2012 2013	1280.191667
409 410 411	Waterfront Waterfront Waterfront	2012 2013 2014	1280.191667 1279.475000
409 410 411 412	Waterfront Waterfront Waterfront West Falls Church	2012 2013 2014 2010	1280.191667 1279.475000 6534.150000
409 410 411 412 413	Waterfront Waterfront Waterfront West Falls Church West Falls Church	2012 2013 2014 2010 2011	1280.191667 1279.475000 6534.150000 6807.950000
409 410 411 412	Waterfront Waterfront Waterfront West Falls Church West Falls Church West Falls Church	2012 2013 2014 2010	1280.191667 1279.475000 6534.150000
409 410 411 412 413	Waterfront Waterfront Waterfront West Falls Church West Falls Church	2012 2013 2014 2010 2011	1280.191667 1279.475000 6534.150000 6807.950000
409 410 411 412 413 414	Waterfront Waterfront Waterfront West Falls Church West Falls Church West Falls Church	2012 2013 2014 2010 2011 2012	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333
409 410 411 412 413 414 415	Waterfront Waterfront Waterfront West Falls Church West Falls Church West Falls Church West Falls Church	2012 2013 2014 2010 2011 2012 2013	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000
409 410 411 412 413 414 415 416	Waterfront Waterfront Waterfront West Falls Church	2012 2013 2014 2010 2011 2012 2013 2014	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333
409 410 411 412 413 414 415 416 417	Waterfront Waterfront Waterfront West Falls Church West Hyattsville	2012 2013 2014 2010 2011 2012 2013 2014 2010	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000
409 410 411 412 413 414 415 416 417 418	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000
409 410 411 412 413 414 415 416 417 418 419 420	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333
409 410 411 412 413 414 415 416 417 418 419 420 421	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000
409 410 411 412 413 414 415 416 417 418 419 420 421 422	Waterfront Waterfront Waterfront West Falls Church West Hyattsville Wheaton	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000
409 410 411 412 413 414 415 416 417 418 419 420 421 422 423	Waterfront Waterfront Waterfront West Falls Church West Hyattsville Wheaton Wheaton	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000 2236.375000
409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville Wheaton Wheaton Wheaton	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000 2236.375000 2119.816667
409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville Wheaton Wheaton Wheaton	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000 2236.375000 2119.816667 2030.066667
409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426	Waterfront Waterfront Waterfront West Falls Church West Falls Church West Falls Church West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville Wheaton Wheaton Wheaton Wheaton	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000 2236.375000 2119.816667 2030.066667
409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville Wheaton Wheaton Wheaton Wheaton Wheaton White Flint	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000 2236.375000 2119.816667 2030.066667 2070.666667 1559.500000
409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville Wheaton Wheaton Wheaton Wheaton Wheaton White Flint White Flint	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000 2236.375000 2119.816667 2030.066667 2070.666667 1559.500000 1635.708333
409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville Wheaton Wheaton Wheaton Wheaton Wheaton White Flint White Flint	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000 2236.375000 2119.816667 2030.066667 2070.666667 1559.500000 1635.708333 1581.841667
409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428	Waterfront Waterfront Waterfront West Falls Church West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville West Hyattsville Wheaton Wheaton Wheaton Wheaton Wheaton White Flint White Flint	2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011 2012 2013 2014 2010 2011	1280.191667 1279.475000 6534.150000 6807.950000 6713.683333 6521.550000 4637.383333 2003.800000 2073.725000 2126.650000 2108.158333 2139.775000 2160.450000 2236.375000 2119.816667 2030.066667 2070.666667 1559.500000 1635.708333

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432
                    Wiehle 2013
                                       3.366667
433
                    Wiehle
                            2014
                                    3721.714286
434
          Woodley Park-Zoo
                            2010
                                    2584.450000
435
          Woodley Park-Zoo
                            2011
                                    2720.841667
436
          Woodley Park-Zoo
                           2012
                                    2723.983333
437
          Woodley Park-Zoo
                            2013
                                    2598.083333
          Woodley Park-Zoo 2014
438
                                    2555.966667
```

[439 rows x 3 columns]

In [8]: df['Diff'] = df.groupby('Station')['Means AM Peak'].transform(pd.Series.diff).fillna(val

In [9]: df

Out[9]:	_	Station	Year	Means AM Peak	Diff
	0	Addison Road	2010	2182.925000	0.000000
	1	Addison Road	2011	2193.325000	10.400000
	2	Addison Road	2012	2077.500000	-115.825000
	3	Addison Road	2013	1995.433333	-82.066667
	4	Addison Road	2014	1967.800000	-27.633333
	5	Anacostia	2010	3014.400000	0.000000
	6	Anacostia	2011	3026.466667	12.066667
	7	Anacostia	2012	2975.716667	-50.750000
	8	Anacostia	2013	2890.183333	-85.533333
	9	Anacostia	2014	2893.400000	3.216667
	10	Archives-Navy Memorial	2010	347.375000	0.000000
	11	Archives-Navy Memorial	2011	378.416667	31.041667
	12	Archives-Navy Memorial	2012	400.516667	22.100000
	13	Archives-Navy Memorial	2013	389.083333	-11.433333
	14	Archives-Navy Memorial	2014	370.591667	-18.491667
	15	Arlington Cemetery	2010	13.650000	0.000000
	16	Arlington Cemetery	2011	16.433333	2.783333
	17	Arlington Cemetery	2012	17.075000	0.641667
	18	Arlington Cemetery	2013	14.425000	-2.650000
	19	Arlington Cemetery	2014	16.333333	1.908333
	20	Ballston	2010	4412.925000	0.000000
	21	Ballston	2011	4543.683333	130.758333
	22	Ballston	2012	4466.250000	-77.433333
	23	Ballston	2013	4397.900000	-68.350000
	24	Ballston	2014	4422.241667	24.341667
	25	Benning Road	2010	1581.100000	0.000000
	26	Benning Road	2011	1557.808333	-23.291667
	27	Benning Road	2012	1553.216667	-4.591667
	28	Benning Road	2013	1571.550000	18.333333
	29	Benning Road	2014	1583.316667	11.766667
		• • • •			
	409	Waterfront	2012	1329.058333	82.775000
	410	Waterfront	2013	1280.191667	-48.866667

```
411
                 Waterfront
                              2014
                                                      -0.716667
                                      1279.475000
412
          West Falls Church
                              2010
                                      6534.150000
                                                       0.000000
413
          West Falls Church
                              2011
                                      6807.950000
                                                     273.800000
414
          West Falls Church
                              2012
                                      6713.683333
                                                     -94.266667
415
          West Falls Church
                              2013
                                      6521.550000
                                                    -192.133333
416
          West Falls Church
                              2014
                                      4637.383333 -1884.166667
417
           West Hyattsville
                              2010
                                      2003.800000
                                                       0.000000
418
           West Hyattsville
                              2011
                                      2073.725000
                                                      69.925000
           West Hyattsville
                              2012
419
                                      2126.650000
                                                      52.925000
           West Hyattsville
                                      2108.158333
420
                              2013
                                                     -18.491667
421
                              2014
           West Hyattsville
                                      2139.775000
                                                      31.616667
422
                              2010
                     Wheaton
                                      2160.450000
                                                       0.000000
423
                              2011
                                      2236.375000
                     Wheaton
                                                      75.925000
424
                     Wheaton
                              2012
                                      2119.816667
                                                    -116.558333
425
                     Wheaton
                              2013
                                      2030.066667
                                                     -89.750000
                              2014
426
                     Wheaton
                                      2070.666667
                                                      40.600000
427
                White Flint
                              2010
                                      1559.500000
                                                       0.00000
428
                White Flint
                              2011
                                      1635.708333
                                                      76.208333
429
                White Flint
                              2012
                                      1581.841667
                                                     -53.866667
430
                White Flint
                              2013
                                                     -33.108333
                                      1548.733333
431
                White Flint
                              2014
                                      1538.941667
                                                      -9.791667
432
                      Wiehle
                              2013
                                          3.366667
                                                       0.000000
                                                    3718.347619
433
                     Wiehle
                              2014
                                      3721.714286
434
           Woodley Park-Zoo
                              2010
                                      2584.450000
                                                       0.000000
435
           Woodley Park-Zoo
                              2011
                                      2720.841667
                                                     136.391667
           Woodley Park-Zoo
436
                              2012
                                      2723.983333
                                                       3.141667
437
           Woodley Park-Zoo
                              2013
                                      2598.083333
                                                    -125.900000
438
           Woodley Park-Zoo
                              2014
                                      2555.966667
                                                     -42.116667
```

[439 rows x 4 columns]

```
In [10]: df['% Change'] = df.groupby('Station')["Means AM Peak"].pct_change().fillna(value=0)
```

In [11]: df

Out[11]:	Station	Year	Means AM Peak	Diff	% Change
0	Addison Road	2010	2182.925000	0.000000	0.000000
1	Addison Road	2011	2193.325000	10.400000	0.004764
2	Addison Road	2012	2077.500000	-115.825000	-0.052808
3	Addison Road	2013	1995.433333	-82.066667	-0.039503
4	Addison Road	2014	1967.800000	-27.633333	-0.013848
5	Anacostia	2010	3014.400000	0.000000	0.000000
6	Anacostia	2011	3026.466667	12.066667	0.004003
7	Anacostia	2012	2975.716667	-50.750000	-0.016769
8	Anacostia	2013	2890.183333	-85.533333	-0.028744
9	Anacostia	2014	2893.400000	3.216667	0.001113
10	Archives-Navy Memorial	2010	347.375000	0.000000	0.000000
11	Archives-Navy Memorial	2011	378.416667	31.041667	0.089361

12 Archives-Navy Memorial 2012 400.516667 22.100000 0.058401 13 Archives-Navy Memorial 2013 389.08333 -11.433333 -0.026546 15 Arlington Cemetery 2010 13.650000 0.000000 0.000000 16 Arlington Cemetery 2011 16.433333 2.783333 0.203907 17 Arlington Cemetery 2012 17.075000 0.641667 0.039047 18 Arlington Cemetery 2013 14.425000 -2.650000 -0.155198 19 Arlington Cemetery 2010 4412.925000 0.000000 0.00000 21 Ballston 2011 4453.683333 13.0758333 0.029631 22 Ballston 2012 4466.250000 -7.433333 0.029631 24 Ballston 2014 4462.250000 -7.433333 0.029631 25 Benning Road 2011 1557.368333 -23.291667 -0.014731 27 Benning Road 2011 1557.368333 -23.291667 -0.007467 28 Benning Road 2012 1553.216667 -4.591667 -0.007667 410 Waterfront 2012 1329.058333						
14 Archives-Navy Memorial 2014 370.591667 -18.491667 -0.047526 15 Arlington Cemetery 2010 13.650000 0.00000 0.00000 16 Arlington Cemetery 2012 17.075000 0.641667 0.039047 17 Arlington Cemetery 2013 14.425000 -2.650000 -0.155198 19 Arlington Cemetery 2014 16.333333 1.9083333 0.123292 20 Ballston 2011 4543.683333 13.0758333 0.029061 21 Ballston 2012 4466.250000 -77.433333 -0.029631 22 Ballston 2014 4462.2941667 24.341667 0.005535 25 Benning Road 2011 1557.808333 -23.291667 -0.015534 26 Benning Road 2012 1553.216667 -4.591667 -0.002948 28 Benning Road 2013 1571.550000 18.33333 0.011867 41 Waterfront 2012 1329.05833 82.7		•		400.516667		0.058401
15 Arlington Cemetery 2010 13.650000 0.000000 0.000000 16 Arlington Cemetery 2011 16.433333 2.783333 0.203907 17 Arlington Cemetery 2012 17.075000 0.641667 0.039047 18 Arlington Cemetery 2014 16.333333 1.908333 0.132293 20 Ballston 2010 4412.925000 0.000000 0.000000 21 Ballston 2011 4543.683333 130.758333 0.029631 22 Ballston 2012 4466.250000 -77.433333 -0.017042 23 Ballston 2013 4397.900000 -68.35000 -0.015304 24 Ballston 2014 4422.241667 24.941667 0.005555 25 Benning Road 2011 1557.808333 -23.291667 -0.014731 27 Benning Road 2012 1557.508033 82.775000 0.066417 410 Waterfront 2012 1329.058333 52.775000	13	Archives-Navy Memorial	2013	389.083333	-11.433333	-0.028546
16 Arlington Cemetery 2011 16.433333 2.783333 0.203907 17 Arlington Cemetery 2012 17.075000 0.641667 0.039047 18 Arlington Cemetery 2013 14.425000 -2.650000 -0.155198 19 Arlington Cemetery 2014 16.333333 1.998333 0.132293 20 Ballston 2011 4543.683333 130.758333 0.029631 22 Ballston 2012 2466.250000 -7.7433333 0.029631 23 Ballston 2012 2466.250000 -7.7433333 0.017042 23 Ballston 2014 4422.241667 2.4341667 0.01535 25 Benning Road 2011 1557.808333 -23.291667 -0.014731 27 Benning Road 2011 1553.216667 -4.591667 -0.014731 28 Benning Road 2013 1571.550000 18.33333 0.011803 29 Benning Road 2013 1575.50000 18.33333	14	Archives-Navy Memorial	2014	370.591667	-18.491667	-0.047526
17 Arlington Cemetery 2012 17.075000 0.641667 0.039047 18 Arlington Cemetery 2013 14.425000 -2.650000 -0.155198 19 Arlington Cemetery 2014 16.333333 1.908333 1.908333 0.020000 20 Ballston 2010 4412.925000 0.000000 0.000000 21 Ballston 2012 4466.250000 -77.43333 0.029631 22 Ballston 2012 4466.250000 -77.43333 0.0015304 24 Ballston 2014 4422.241667 24.341667 0.015304 24 Ballston 2014 4422.241667 24.341667 0.005535 25 Benning Road 2012 1553.216667 -4.591667 -0.002948 28 Benning Road 2012 1553.216667 -4.591667 -0.007487 27 Benning Road 2014 1583.316667 11.766667 0.007487 1 1 Waterfront 2012 1329.08833 <td>15</td> <td>Arlington Cemetery</td> <td>2010</td> <td>13.650000</td> <td>0.000000</td> <td>0.000000</td>	15	Arlington Cemetery	2010	13.650000	0.000000	0.000000
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427 White Flint 2010 1559.500000 0.000000 0.000000 428 White Flint 2011 1635.708333 76.208333 0.048867 429 White Flint 2012 1581.841667 -53.866667 -0.032932 430 White Flint 2013 1548.733333 -33.108333 -0.020930 431 White Flint 2014 1538.941667 -9.791667 -0.006322 432 Wiehle 2013 3.366667 0.000000 0.000000 433 Wiehle 2014 3721.714286 3718.347619 1104.459689 434 Woodley Park-Zoo 2010 2584.450000 0.000000 0.000000 435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155						
428 White Flint 2011 1635.708333 76.208333 0.048867 429 White Flint 2012 1581.841667 -53.866667 -0.032932 430 White Flint 2013 1548.733333 -33.108333 -0.020930 431 White Flint 2014 1538.941667 -9.791667 -0.006322 432 Wiehle 2013 3.366667 0.000000 0.000000 433 Wiehle 2014 3721.714286 3718.347619 1104.459689 434 Woodley Park-Zoo 2010 2584.450000 0.000000 0.000000 435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155						
429 White Flint 2012 1581.841667 -53.866667 -0.032932 430 White Flint 2013 1548.733333 -33.108333 -0.020930 431 White Flint 2014 1538.941667 -9.791667 -0.006322 432 Wiehle 2013 3.366667 0.000000 0.000000 433 Wiehle 2014 3721.714286 3718.347619 1104.459689 434 Woodley Park-Zoo 2010 2584.450000 0.000000 0.000000 435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155						
430 White Flint 2013 1548.733333 -33.108333 -0.020930 431 White Flint 2014 1538.941667 -9.791667 -0.006322 432 Wiehle 2013 3.366667 0.000000 0.000000 433 Wiehle 2014 3721.714286 3718.347619 1104.459689 434 Woodley Park-Zoo 2010 2584.450000 0.000000 0.000000 435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155					76.208333	
431 White Flint 2014 1538.941667 -9.791667 -0.006322 432 Wiehle 2013 3.366667 0.000000 0.000000 433 Wiehle 2014 3721.714286 3718.347619 1104.459689 434 Woodley Park-Zoo 2010 2584.450000 0.000000 0.000000 435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155	429	White Flint	2012		-53.866667	
432 Wiehle 2013 3.366667 0.000000 0.000000 433 Wiehle 2014 3721.714286 3718.347619 1104.459689 434 Woodley Park-Zoo 2010 2584.450000 0.000000 0.000000 435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155	430	White Flint	2013	1548.733333	-33.108333	-0.020930
433 Wiehle 2014 3721.714286 3718.347619 1104.459689 434 Woodley Park-Zoo 2010 2584.450000 0.000000 0.000000 435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155	431	White Flint	2014	1538.941667	-9.791667	-0.006322
434 Woodley Park-Zoo 2010 2584.450000 0.000000 0.000000 435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155	432	Wiehle	2013	3.366667	0.000000	0.000000
435 Woodley Park-Zoo 2011 2720.841667 136.391667 0.052774 436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155	433	Wiehle	2014	3721.714286	3718.347619	1104.459689
436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155	434	Woodley Park-Zoo	2010	2584.450000	0.000000	0.000000
436 Woodley Park-Zoo 2012 2723.983333 3.141667 0.001155	435	Woodley Park-Zoo	2011	2720.841667	136.391667	0.052774
·	436	Woodley Park-Zoo	2012	2723.983333	3.141667	0.001155
	437	_	2013	2598.083333	-125.900000	-0.046219

```
438
                     Woodley Park-Zoo 2014
                                                                               -0.016211
                                                 2555.966667
                                                                -42.116667
         [439 rows x 5 columns]
In [13]: def label(change):
             if change < 0.05 and change > -0.05:
                  return "flat"
             if change < 0:
                  return "down"
             if change > 0:
                  return "up"
In [14]: df['Label'] = df.apply(lambda row: label(row['% Change']), axis=1)
In [15]: df
Out [15]:
                               Station Year
                                              Means AM Peak
                                                                      Diff
                                                                                % Change
         0
                         Addison Road
                                        2010
                                                                                0.00000
                                                 2182.925000
                                                                  0.00000
                         Addison Road
                                        2011
         1
                                                 2193.325000
                                                                 10.400000
                                                                                0.004764
         2
                         Addison Road
                                        2012
                                                 2077.500000
                                                               -115.825000
                                                                               -0.052808
         3
                         Addison Road
                                        2013
                                                 1995.433333
                                                                -82.066667
                                                                               -0.039503
         4
                         Addison Road
                                        2014
                                                 1967.800000
                                                                -27.633333
                                                                               -0.013848
         5
                                        2010
                            Anacostia
                                                 3014.400000
                                                                  0.000000
                                                                                0.000000
         6
                            Anacostia
                                        2011
                                                 3026.466667
                                                                 12.066667
                                                                                0.004003
         7
                                        2012
                            Anacostia
                                                 2975.716667
                                                                -50.750000
                                                                               -0.016769
         8
                            Anacostia
                                        2013
                                                 2890.183333
                                                                -85.533333
                                                                               -0.028744
         9
                            Anacostia
                                        2014
                                                 2893.400000
                                                                  3.216667
                                                                                0.001113
         10
               Archives-Navy Memorial
                                        2010
                                                                  0.000000
                                                                                0.000000
                                                  347.375000
         11
               Archives-Navy Memorial
                                        2011
                                                  378.416667
                                                                 31.041667
                                                                                0.089361
         12
               Archives-Navy Memorial
                                        2012
                                                                                0.058401
                                                  400.516667
                                                                 22.100000
              Archives-Navy Memorial
                                        2013
         13
                                                  389.083333
                                                                -11.433333
                                                                               -0.028546
              Archives-Navy Memorial
         14
                                        2014
                                                  370.591667
                                                                -18.491667
                                                                               -0.047526
         15
                   Arlington Cemetery
                                        2010
                                                   13.650000
                                                                  0.00000
                                                                                0.00000
         16
                   Arlington Cemetery
                                        2011
                                                   16.433333
                                                                  2.783333
                                                                                0.203907
                   Arlington Cemetery
                                        2012
         17
                                                                                0.039047
                                                   17.075000
                                                                  0.641667
                   Arlington Cemetery
                                        2013
         18
                                                   14.425000
                                                                 -2.650000
                                                                               -0.155198
                   Arlington Cemetery
         19
                                        2014
                                                   16.333333
                                                                  1.908333
                                                                                0.132293
         20
                             Ballston
                                        2010
                                                 4412.925000
                                                                  0.000000
                                                                                0.000000
         21
                             Ballston
                                        2011
                                                 4543.683333
                                                                130.758333
                                                                                0.029631
         22
                                        2012
                                                                -77.433333
                             Ballston
                                                 4466.250000
                                                                               -0.017042
         23
                             Ballston
                                        2013
                                                 4397.900000
                                                                -68.350000
                                                                               -0.015304
         24
                             Ballston
                                        2014
                                                 4422.241667
                                                                 24.341667
                                                                                0.005535
         25
                         Benning Road
                                        2010
                                                 1581.100000
                                                                  0.000000
                                                                                0.000000
         26
                         Benning Road
                                        2011
                                                 1557.808333
                                                                -23.291667
                                                                               -0.014731
         27
                         Benning Road
                                        2012
                                                 1553.216667
                                                                 -4.591667
                                                                               -0.002948
                         Benning Road
                                        2013
         28
                                                 1571.550000
                                                                 18.333333
                                                                                0.011803
         29
                         Benning Road
                                        2014
                                                                                0.007487
                                                 1583.316667
                                                                 11.766667
```

1329.058333

82.775000

0.066417

2012

Waterfront

409

410	Waterfront	2013	1280.191667	-48.866667	-0.036768
411	Waterfront	2014	1279.475000	-0.716667	-0.000560
412	West Falls Church	2010	6534.150000	0.000000	0.000000
413	West Falls Church	2011	6807.950000	273.800000	0.041903
414	West Falls Church	2012	6713.683333	-94.266667	-0.013847
415	West Falls Church	2013	6521.550000	-192.133333	-0.028618
416	West Falls Church	2014	4637.383333	-1884.166667	-0.288914
417	West Hyattsville	2010	2003.800000	0.000000	0.000000
418	West Hyattsville	2011	2073.725000	69.925000	0.034896
419	West Hyattsville	2012	2126.650000	52.925000	0.025522
420	West Hyattsville	2013	2108.158333	-18.491667	-0.008695
421	West Hyattsville	2014	2139.775000	31.616667	0.014997
422	Wheaton	2010	2160.450000	0.000000	0.000000
423	Wheaton	2011	2236.375000	75.925000	0.035143
424	Wheaton	2012	2119.816667	-116.558333	-0.052119
425	Wheaton	2013	2030.066667	-89.750000	-0.042339
426	Wheaton	2014	2070.666667	40.600000	0.019999
427	White Flint	2010	1559.500000	0.000000	0.000000
428	White Flint	2011	1635.708333	76.208333	0.048867
429	White Flint	2012	1581.841667	-53.866667	-0.032932
430	White Flint	2013	1548.733333	-33.108333	-0.020930
431	White Flint	2014	1538.941667	-9.791667	-0.006322
432	Wiehle	2013	3.366667	0.000000	0.000000
433	Wiehle	2014	3721.714286	3718.347619	1104.459689
434	Woodley Park-Zoo	2010	2584.450000	0.000000	0.000000
435	Woodley Park-Zoo	2011	2720.841667	136.391667	0.052774
436	Woodley Park-Zoo	2012	2723.983333	3.141667	0.001155
437	Woodley Park-Zoo	2013	2598.083333	-125.900000	-0.046219
438	Woodley Park-Zoo	2014	2555.966667	-42.116667	-0.016211

Label 0 flat flat 1 2 down 3 flat flat 4 5 flat flat 6 7 flat 8 flat 9 flat 10 flat 11 up 12 up 13 flat 14 flat

15

16

flat

up

```
17
              flat
         18
              down
         19
                up
         20
              flat
         21
              flat
         22
              flat
         23
              flat
         24
              flat
         25
              flat
         26
              flat
         27
              flat
         28
              flat
         29
              flat
                . . .
         . .
         409
                up
         410
              flat
         411
              flat
         412
              flat
         413
              flat
         414 flat
         415
              flat
         416
              down
         417
              flat
         418
              flat
         419
              flat
         420
              flat
         421
              flat
         422
              flat
         423
              flat
         424
              down
         425
              flat
         426
              flat
         427
              flat
         428
              flat
         429
              flat
              flat
         430
         431
              flat
         432
              flat
         433
                up
         434
              flat
         435
                up
         436
              flat
         437
              flat
         438
              flat
         [439 rows x 6 columns]
In [16]:
             df.to_excel('change_values_am_peak.xlsx', sheet_name='Sheet1')
```

In []: