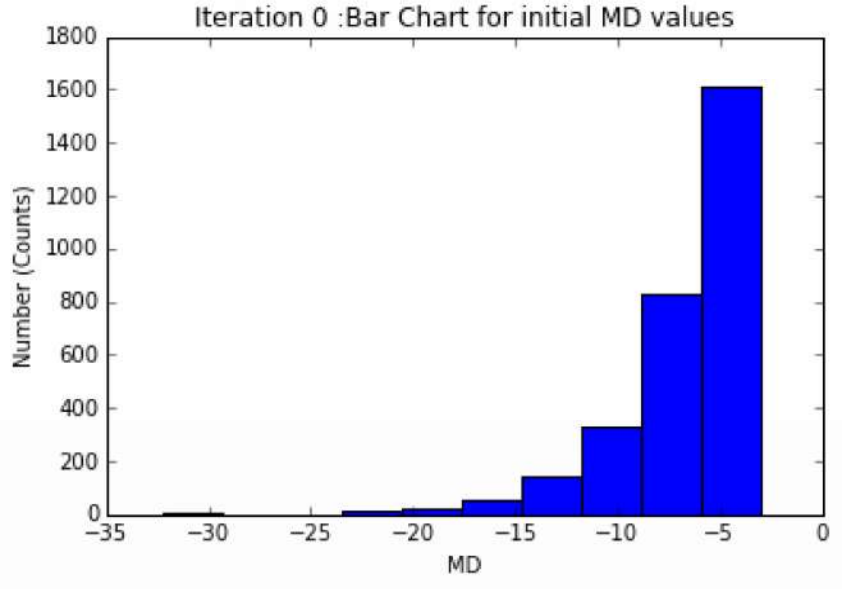
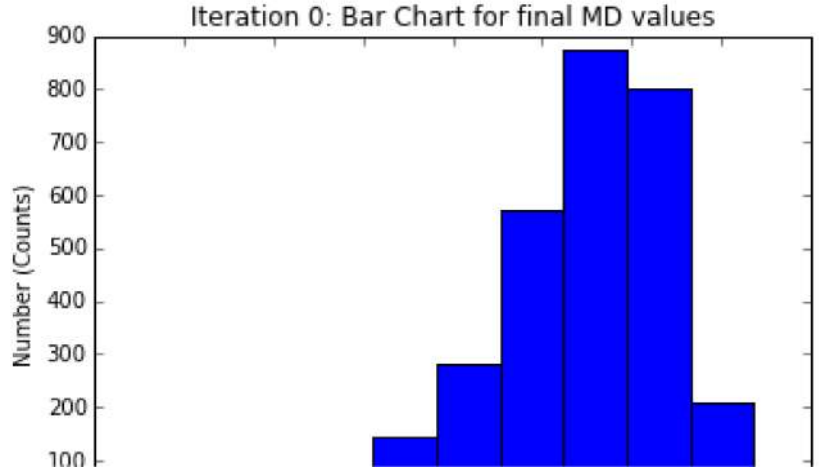
In [1]:

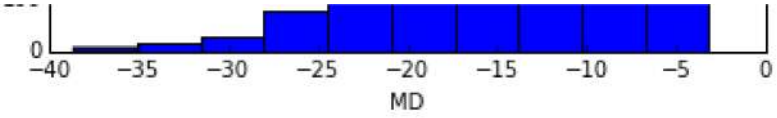
```
#error checking measures
import csv
import matplotlib.pyplot as plt
numberofGraphs = 15
def csv_dict_writer(path, fieldnames, data):
    with open(path, "wb") as out_file:
        writer = csv.DictWriter(out_file, delimiter=',', fieldnames=fieldnames)
        writer.writeheader()
        for row in data:
            writer.writerow(row)
masterListforReplications = []
field_names = "QALY,TotalCost".split(",")
from PlottingSystemClass import PlottingSystem
from SimulationSystemClass import SimulationSystem
plottingsystem = PlottingSystem(plt)
order = 1
%matplotlib inline
for i in range(2):
    sysSimulation = SimulationSystem(3000,"PatientList/Patients_list_{}.csv".format(i
    sysSimulation.SystemSimulation()
    plottingsystem.plot(sysSimulation,order,i,masterListforReplications)
    order += (numberofGraphs*1)
    del sysSimulation
print order
csv_dict_writer("MList.csv",field_names,masterListforReplications)
```

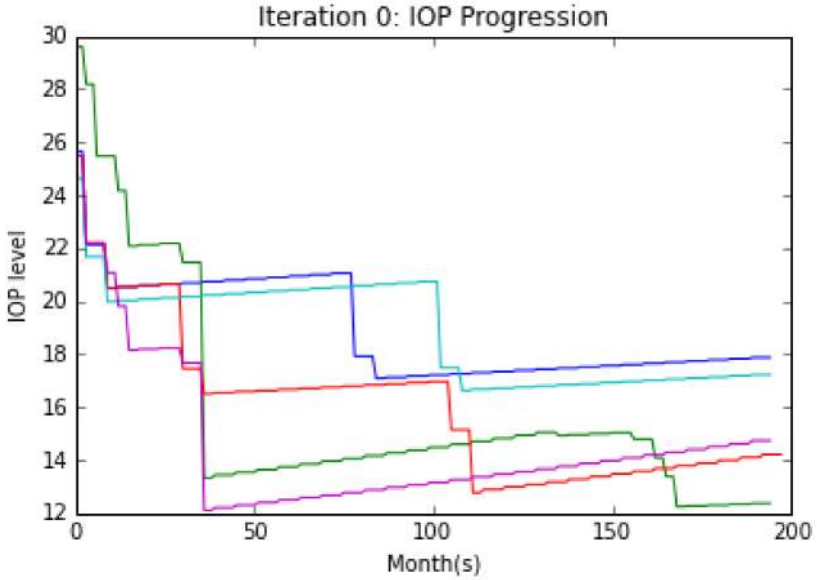
```
CURRENT ITERATION: 0
Average QALY: 12.5193705506
Average Medical Cost: 26036.7212333
Average MD: -13.1475014388

Patient 0: List of Medication Progression is [0, 1, 1, 6, 6, 6, 6, 6, 6, 6, 6, 6, 6,
6, 6, 6, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8]
Patient 0: List of Final Medication Amount is [5, 3, 1, 0, 0]
Patient 1: List of Medication Progression is [0, 2, 2, 3, 3, 3, 21, 5, 5, 5, 5, 5, 3
0, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 3
0, 30, 30, 30, 30, 8, 9, 9, 5, 5, 5, 5, 5, 5]
Patient 1: List of Final Medication Amount is [2, 3, 4, 2, 5]
Patient 2: List of Medication Progression is [0, 1, 1, 6, 6, 6, 6, 6, 9, 9, 9, 9, 9,
9, 9, 9, 9, 9, 9, 9, 9, 9, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 3
0, 30, 30, 30, 30, 30]
Patient 2: List of Final Medication Amount is [6, 4, 0, 2, 0]
Patient 3: List of Medication Progression is [0, 1, 1, 6, 6, 6, 6, 6, 6, 6, 6, 6,
6, 6, 6, 6, 6, 6, 6, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9, 9]
Patient 3: List of Final Medication Amount is [5, 3, 0, 1, 0]
Patient 4: List of Medication Progression is [0, 1, 1, 7, 7, 12, 12, 5, 5, 5, 5, 5,
30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30,
30, 30, 30, 30, 30, 30, 30, 30, 30, 30]
Patient 4: List of Final Medication Amount is [4, 0, 1, 1, 2]
CURRENT ITERATION: 1
Average QALY: 12.4890197565
Average Medical Cost: 26567.0556333
Average MD: -13.2691357262
```

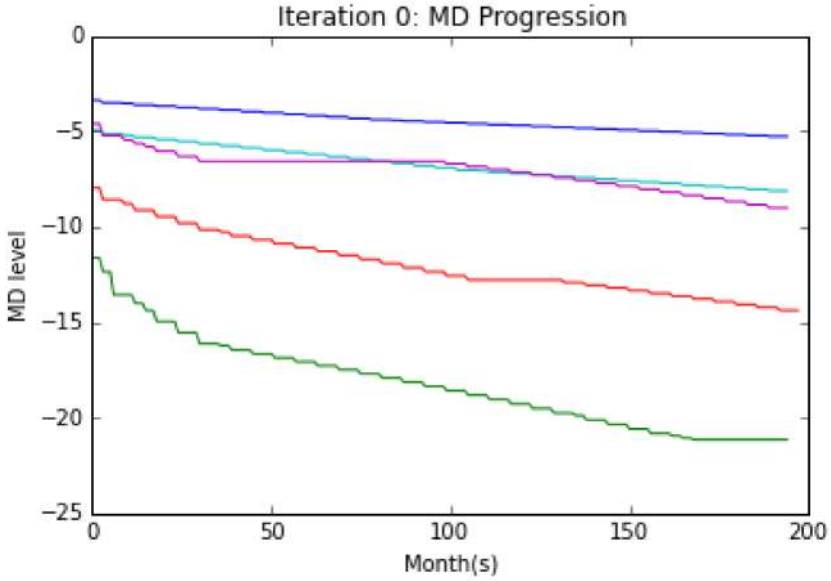
```
Patient 0: List of Medication Progression is [0, 1, 1, 6, 6, 6, 6, 6, 8, 8, 8, 8, 8,
8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 10, 10, 10, 10, 10, 10, 10, 30, 30, 30, 30, 30, 30, 3
0, 30, 30, 30]
Patient 0: List of Final Medication Amount is [8, 6, 4, 0, 2]
Patient 1: List of Medication Progression is [0, 1, 1, 6, 6, 8, 8, 8, 8, 8, 8, 8, 8,
8, 8, 8, 8, 8, 8, 8, 8, 8, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10]
Patient 1: List of Final Medication Amount is [8, 6, 4, 0, 2]
Patient 2: List of Medication Progression is [0, 1, 1, 6, 6, 6, 6, 6, 6, 6, 6, 8, 8,
8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 8, 10, 30, 30, 30, 30, 30, 30, 30, 30,
30, 30, 30]
Patient 2: List of Final Medication Amount is [7, 5, 3, 0, 1]
Patient 3: List of Medication Progression is [0, 1, 1, 6, 6, 6, 6, 6, 8, 8, 8, 8, 8,
8, 8, 10, 10, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 30, 3
0, 30, 30, 30, 30, 30]
Patient 3: List of Final Medication Amount is [8, 6, 4, 0, 2]
Patient 4: List of Medication Progression is [0, 1, 1, 6, 6, 6, 6, 6, 8, 9, 9, 9, 1
1, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 30, 30, 30, 30, 30, 30, 3
0, 30, 30, 30, 30, 30, 30, 30, 30]
Patient 4: List of Final Medication Amount is [9, 7, 1, 4, 2]
31

C:\Users\Martin Nguyen\Anaconda\lib\site-packages\matplotlib\pyplot.py:424: RuntimeW
arning: More than 20 figures have been opened. Figures created through the pyplot in
terface (`matplotlib.pyplot.figure`) are retained until explicitly closed and may co
nsume too much memory. (To control this warning, see the rcParam `figure.max_open_wa
rning`).
  max_open_warning, RuntimeWarning)
```

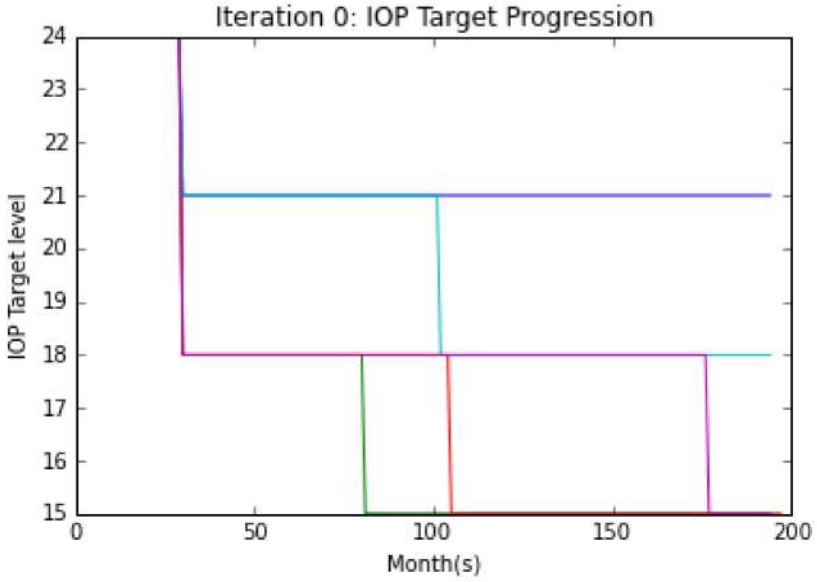




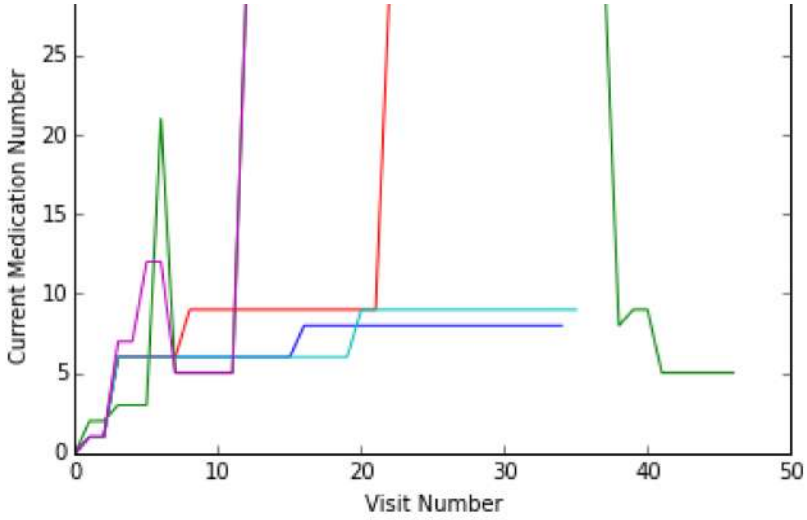

0
−40
−35
−30
−25
−20
−15
−10
−5
0
MD

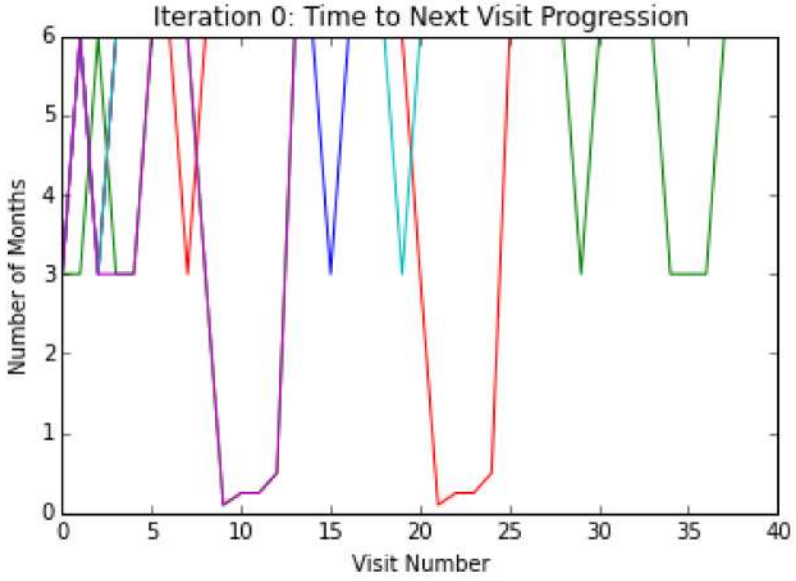

Iteration 0: IOP Progression
IOP level
Month(s)

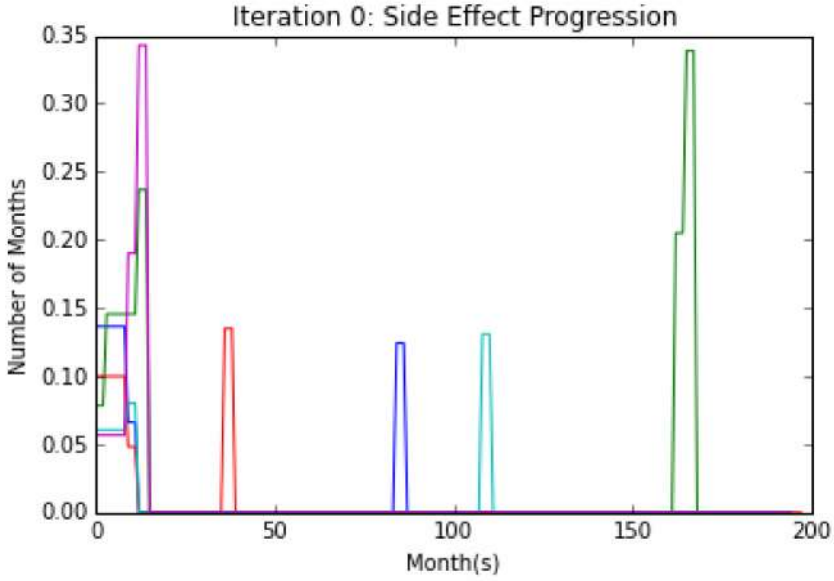

Iteration 0: MD Progression
MD level
Month(s)

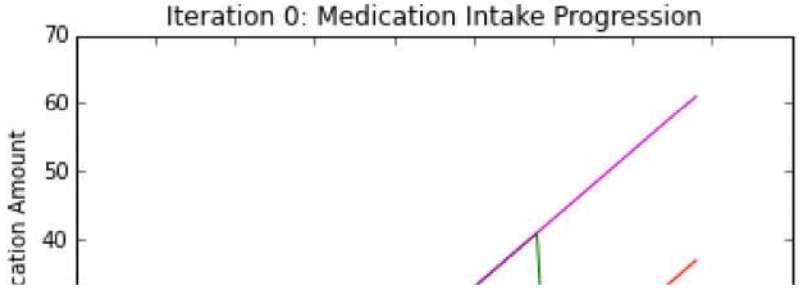

Iteration 0: IOP Target Progression
IOP Target level
Month(s)

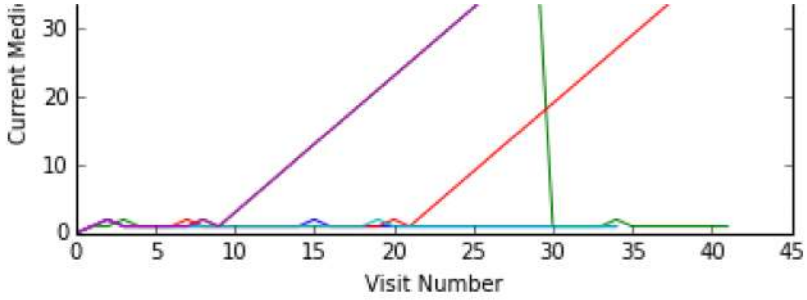
Iteration 0: Current Medication Progression
30

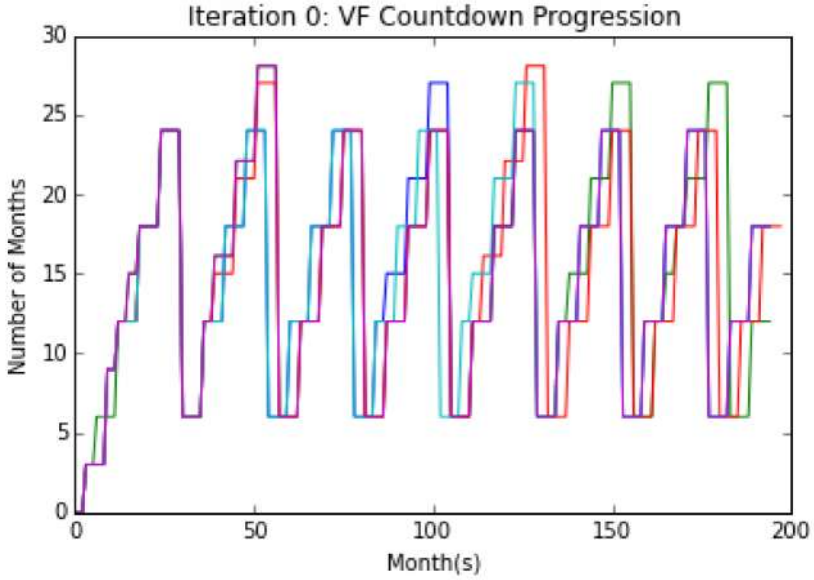

Current Medication Number
Visit Number
0
5
10
15
20
25
0
10
20
30
40
50

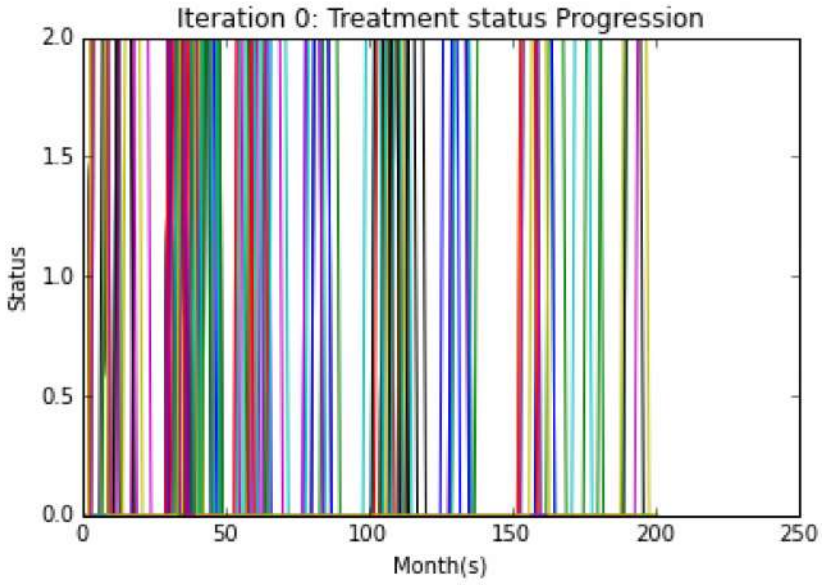

Iteration 0: Time to Next Visit Progression
Number of Months
Visit Number
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40

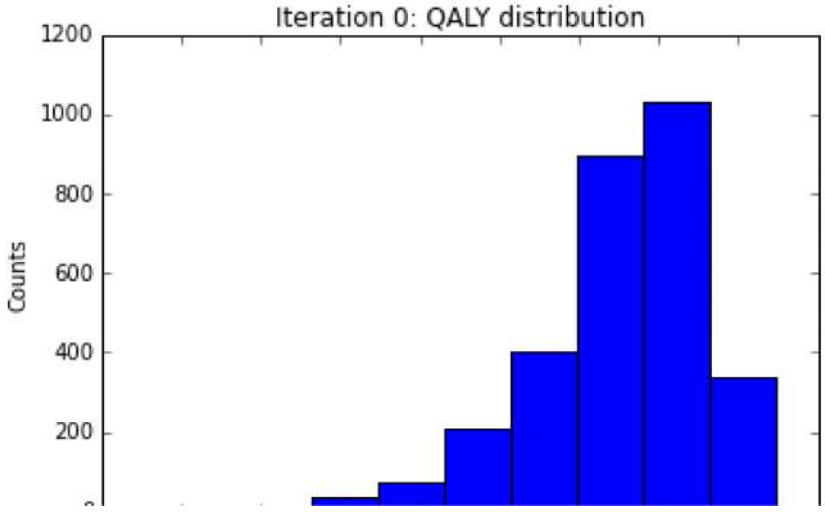

Iteration 0: Side Effect Progression
Number of Months
Month(s)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0
50
100
150
200

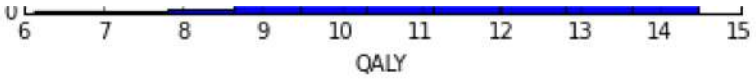

Iteration 0: Medication Intake Progression
cation Amount
40
50
60
70

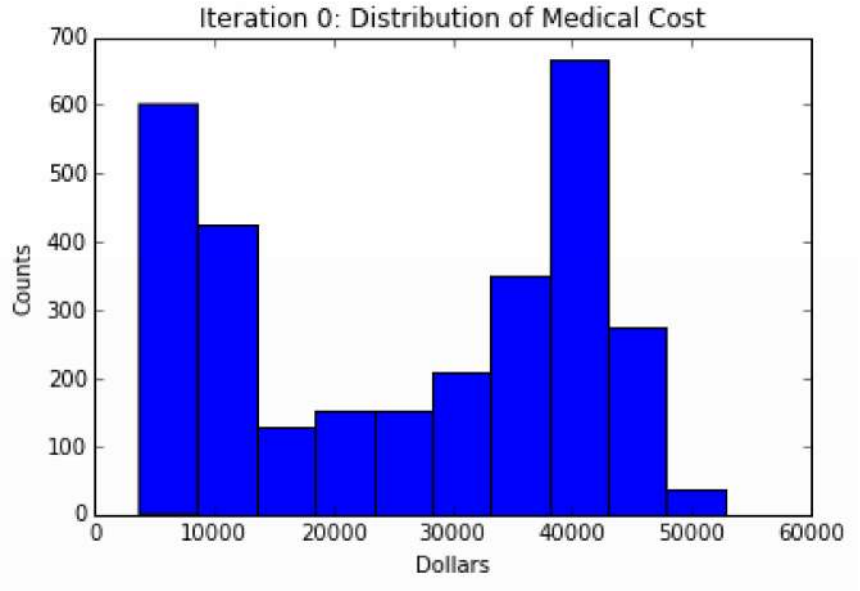

Current Medi
Visit Number

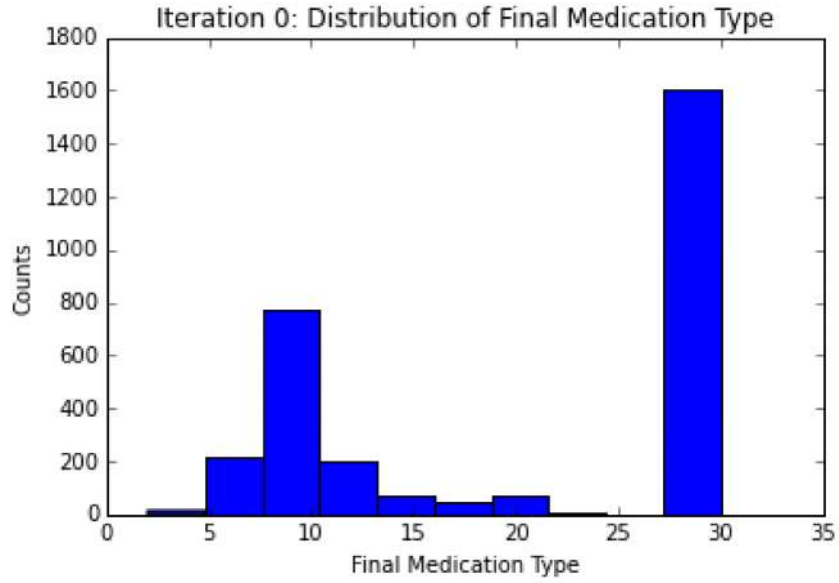

Iteration 0: VF Countdown Progression
Number of Months
Month(s)

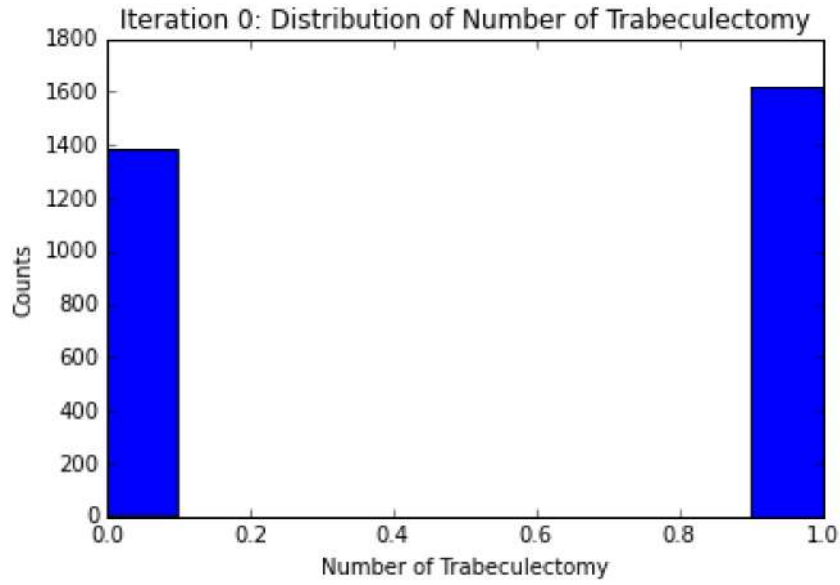

Iteration 0: Treatment status Progression
Status
Month(s)

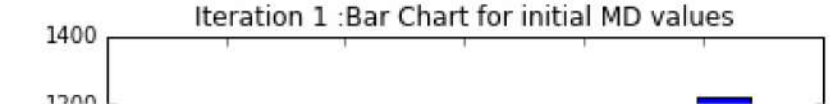

Iteration 0: QALY distribution
Counts

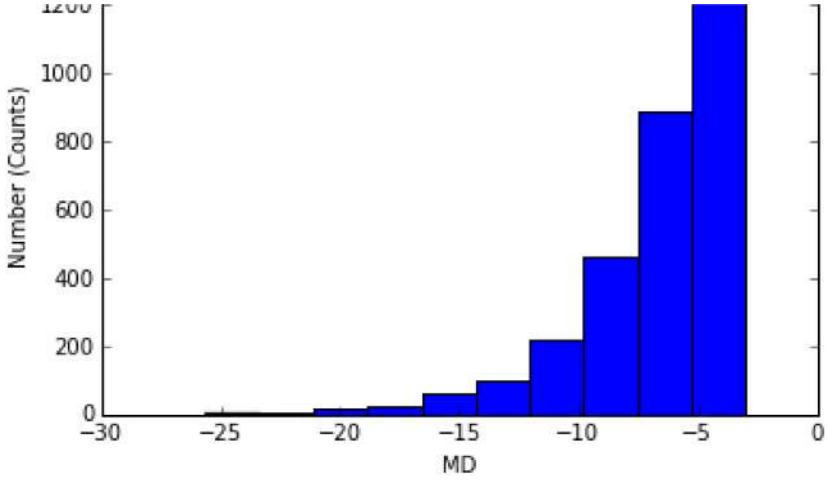

6
7
8
9
10
11
12
13
14
15
QALY

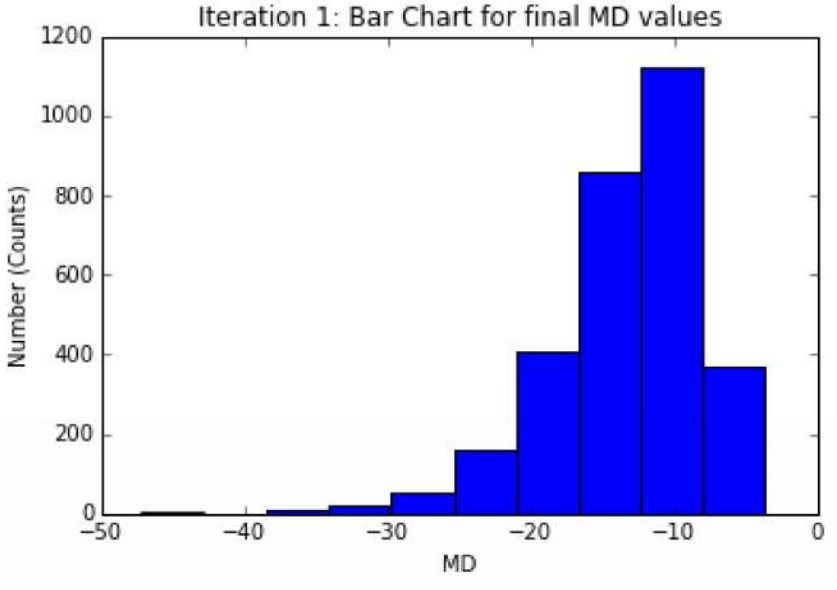

Iteration 0: Distribution of Medical Cost
Counts
Dollars
0
100
200
300
400
500
600
700
0
10000
20000
30000
40000
50000
60000

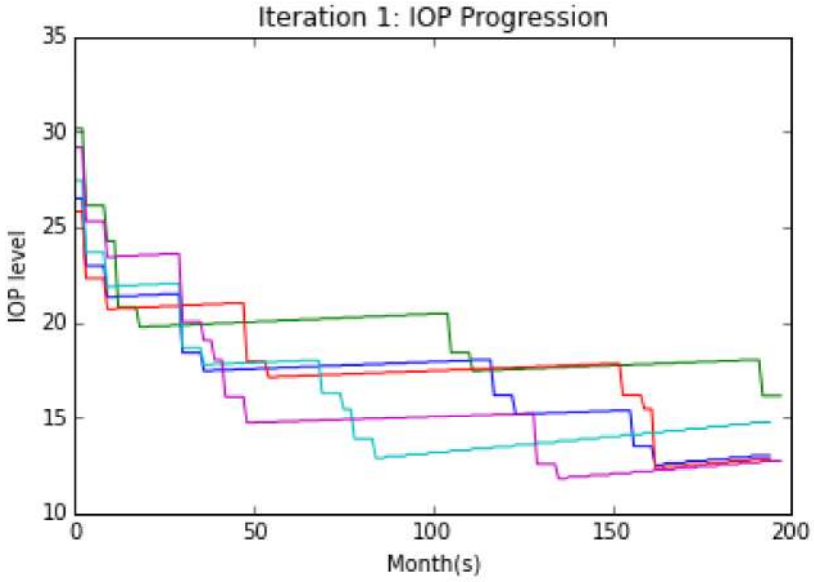

Iteration 0: Distribution of Final Medication Type
Counts
Final Medication Type
0
200
400
600
800
1000
1200
1400
1600
1800
0
5
10
15
20
25
30
35

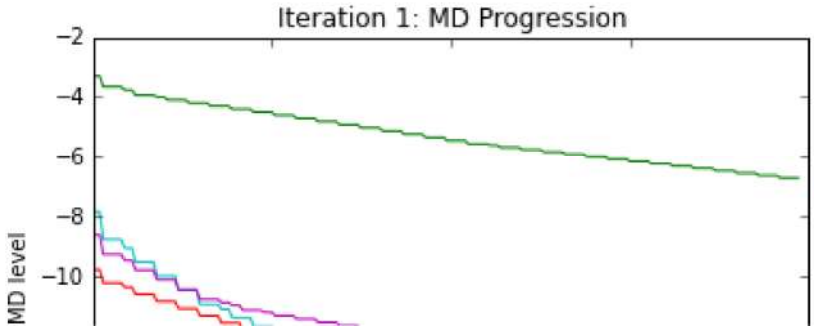

Iteration 0: Distribution of Number of Trabeculectomy
Counts
Number of Trabeculectomy
0
200
400
600
800
1000
1200
1400
1600
1800
0.0
0.2
0.4
0.6
0.8
1.0

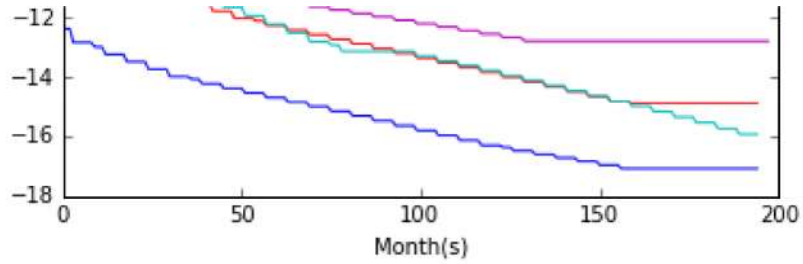

Iteration 1 :Bar Chart for initial MD values
1400

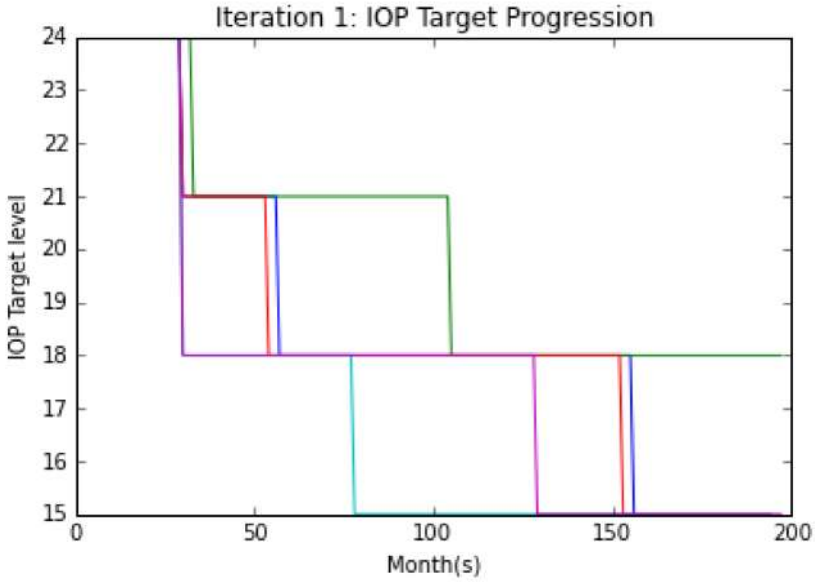

Number (Counts)
MD

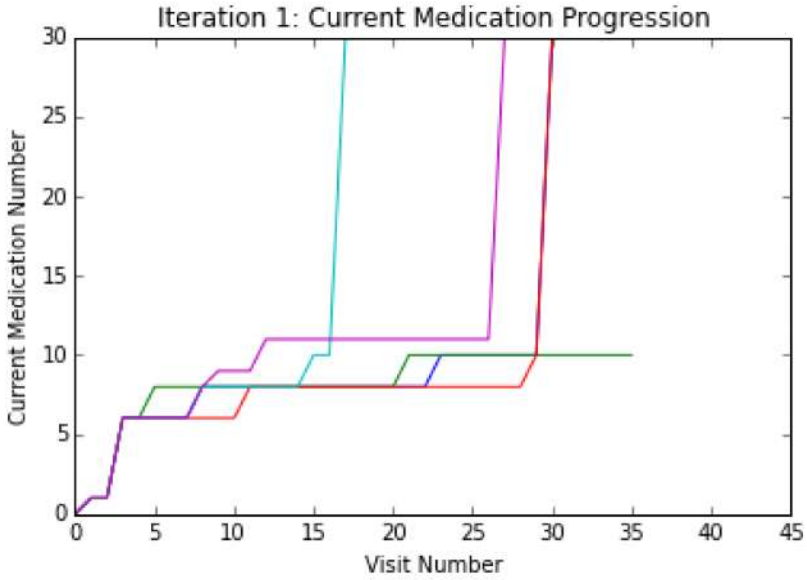

Iteration 1: Bar Chart for final MD values
Number (Counts)
MD

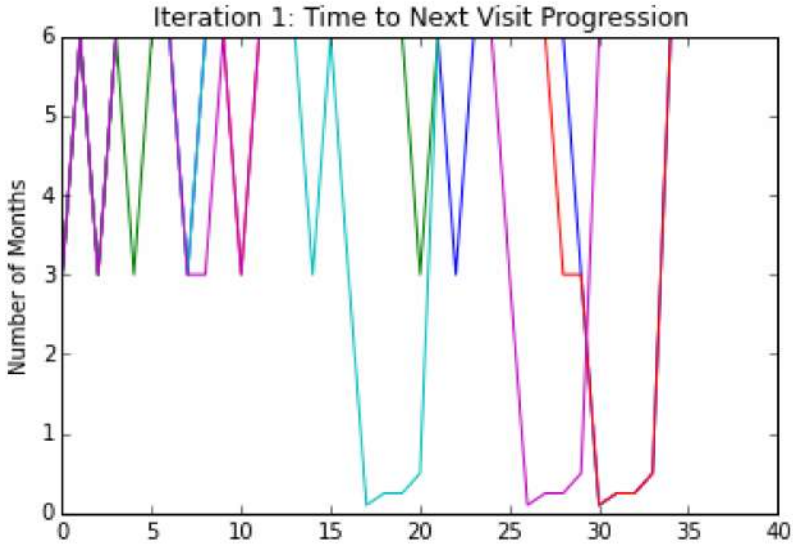

Iteration 1: IOP Progression
IOP level
Month(s)


Iteration 1: MD Progression
MD level

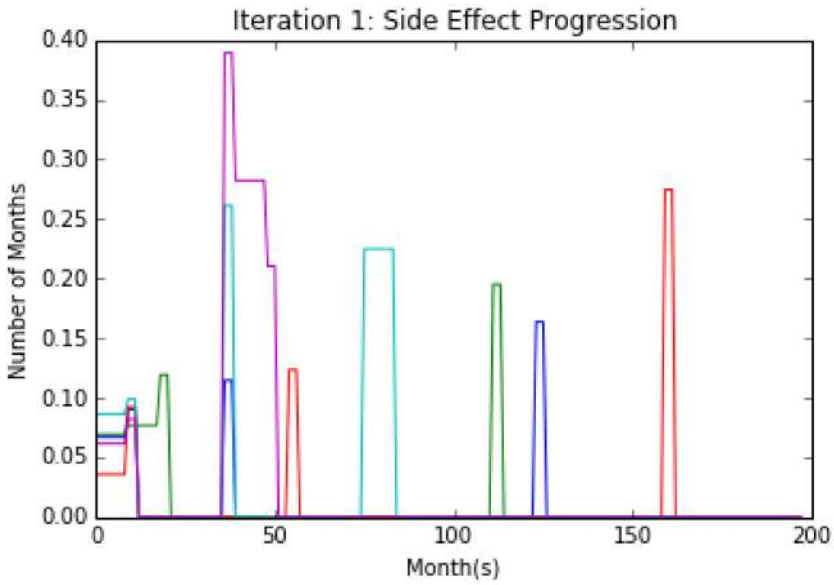

−12
−14
−16
−18
0
50
100
150
200
Month(s)

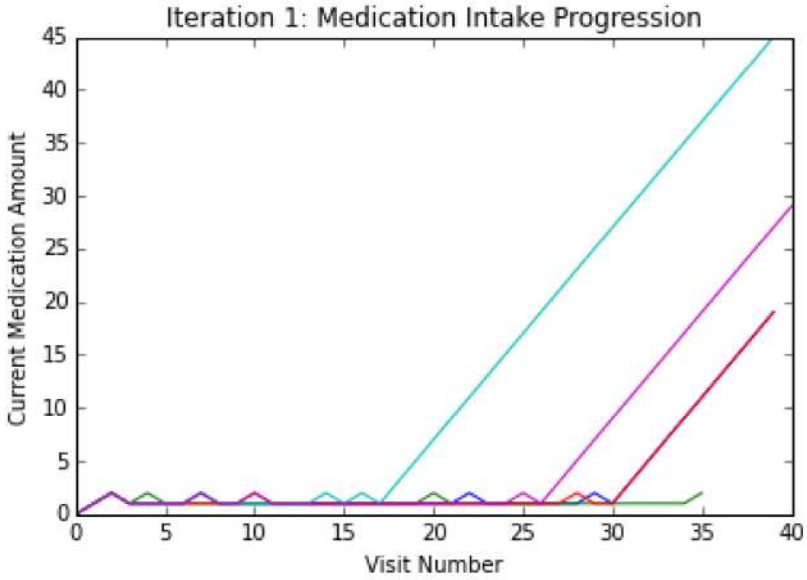

Iteration 1: IOP Target Progression
IOP Target level
Month(s)

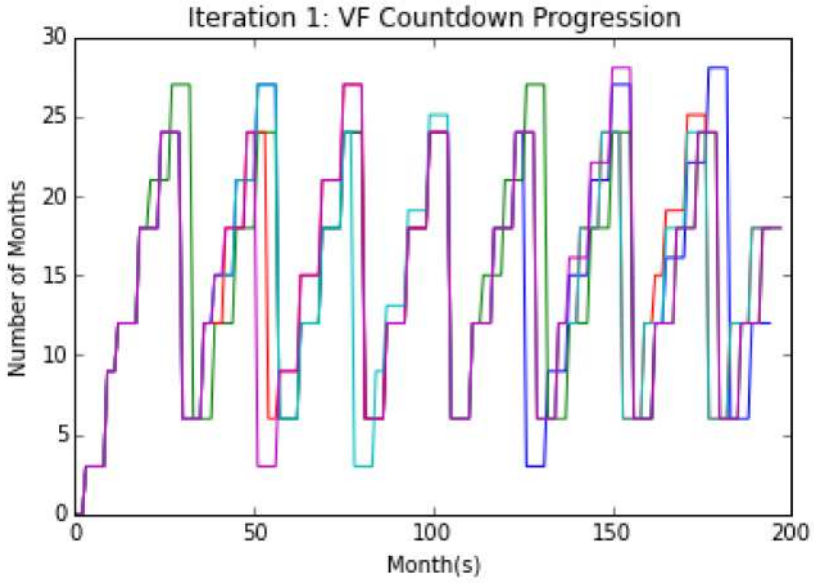

Iteration 1: Current Medication Progression
Current Medication Number
Visit Number

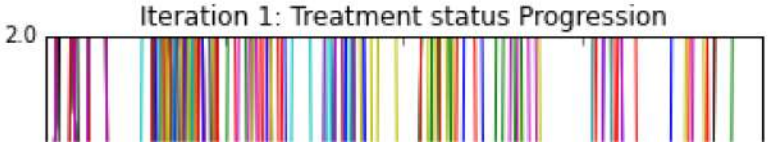

Iteration 1: Time to Next Visit Progression
Number of Months

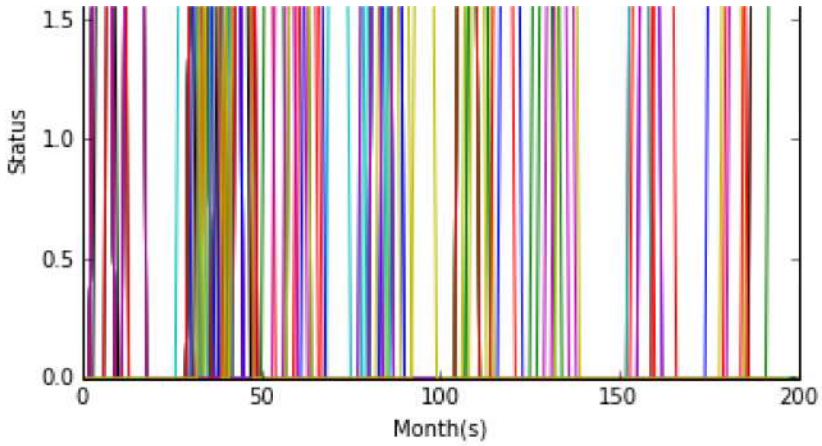
Visit Number

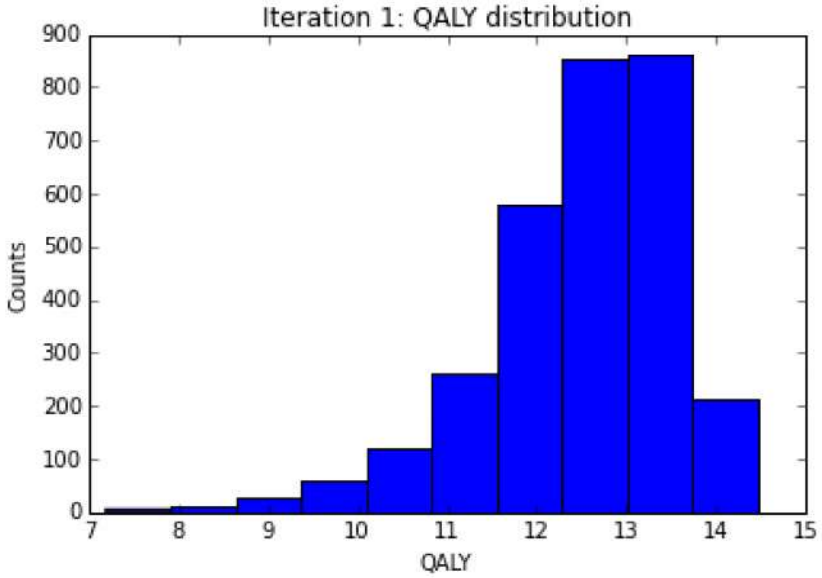


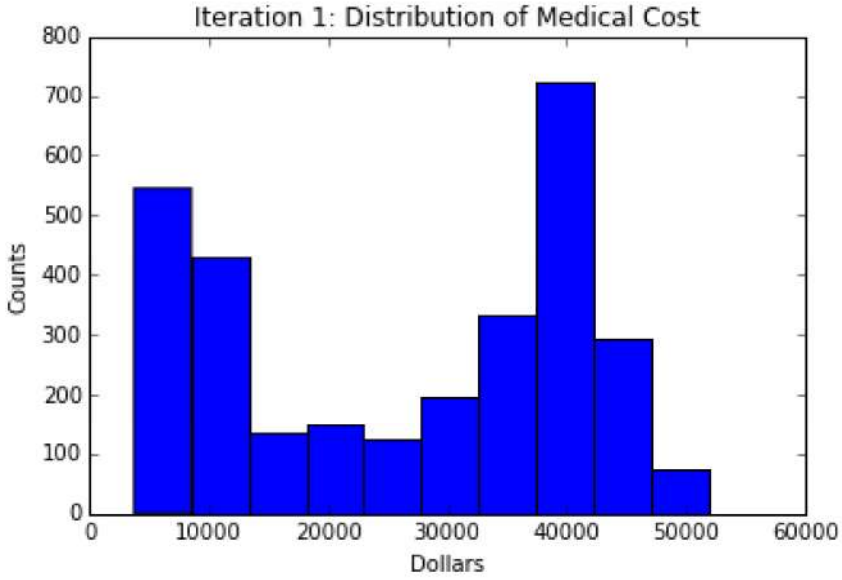


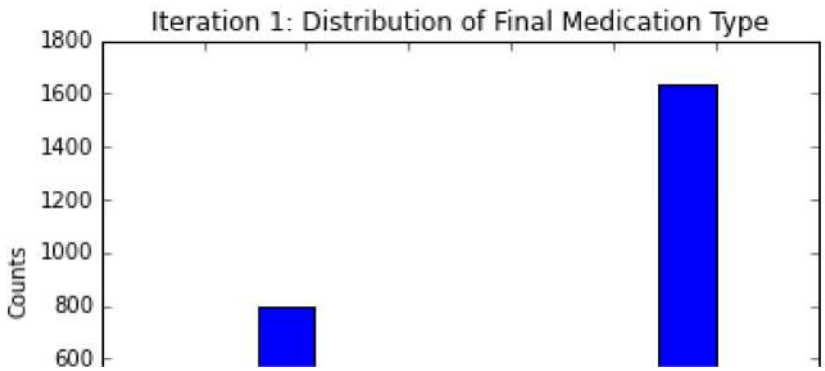


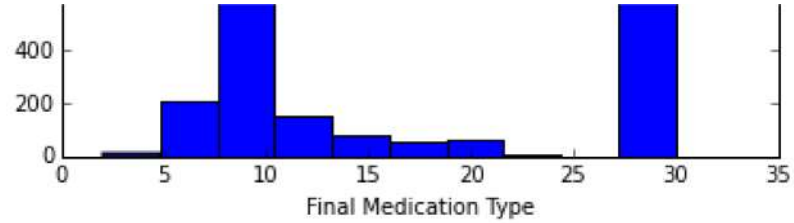


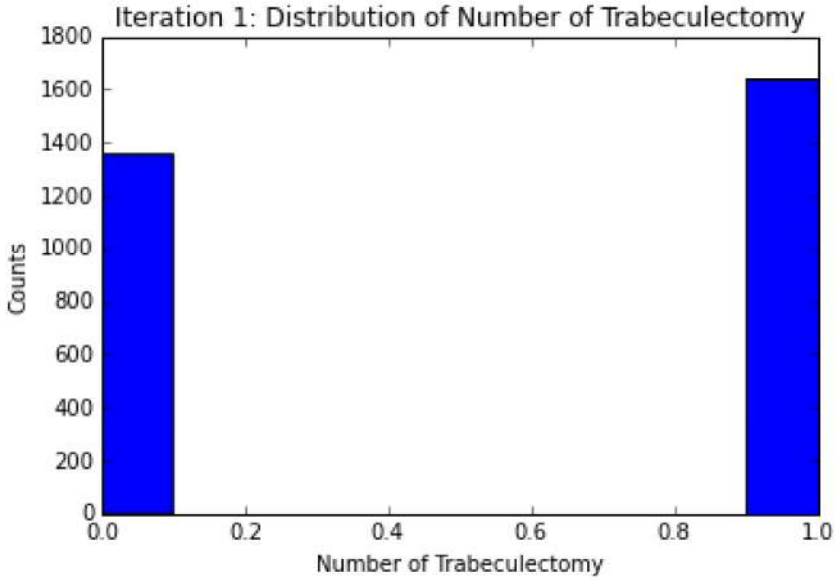

Status
Month(s)


Iteration 1: QALY distribution
Counts
QALY


Iteration 1: Distribution of Medical Cost
Counts
Dollars


Iteration 1: Distribution of Final Medication Type
Counts


400
200
0
0
5
10
15
20
25
30
35
Final Medication Type


Iteration 1: Distribution of Number of Trabeculectomy
1800
1600
1400
1200
1000
800
600
400
200
0
Counts
0.0
0.2
0.4
0.6
0.8
1.0
Number of Trabeculectomy

In [ ]: