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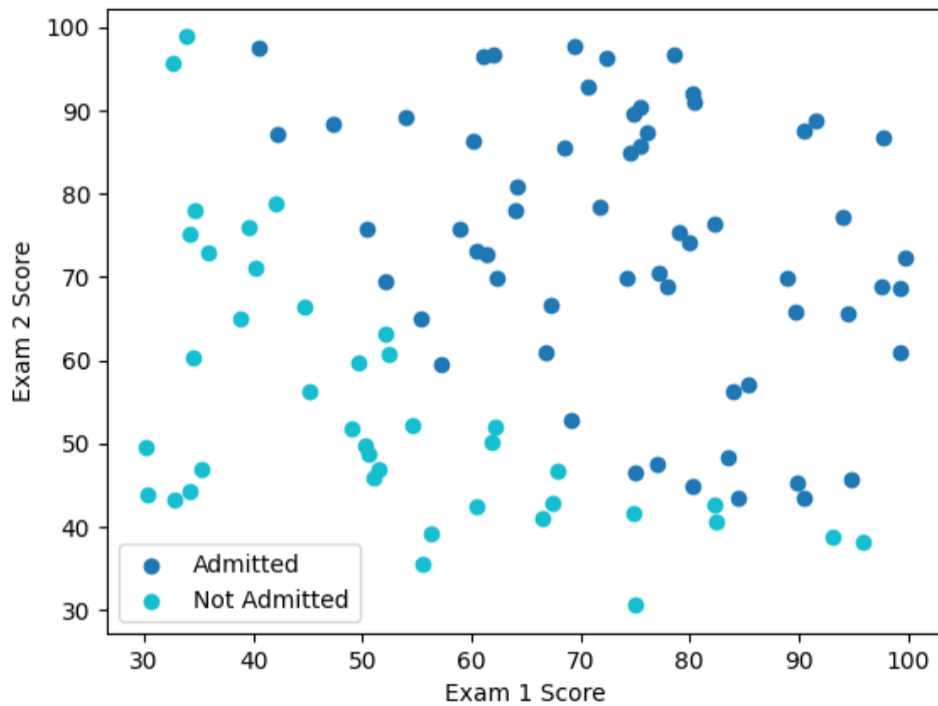
02/05/2024

Problem Set 3

1. a) See ps3.py for code

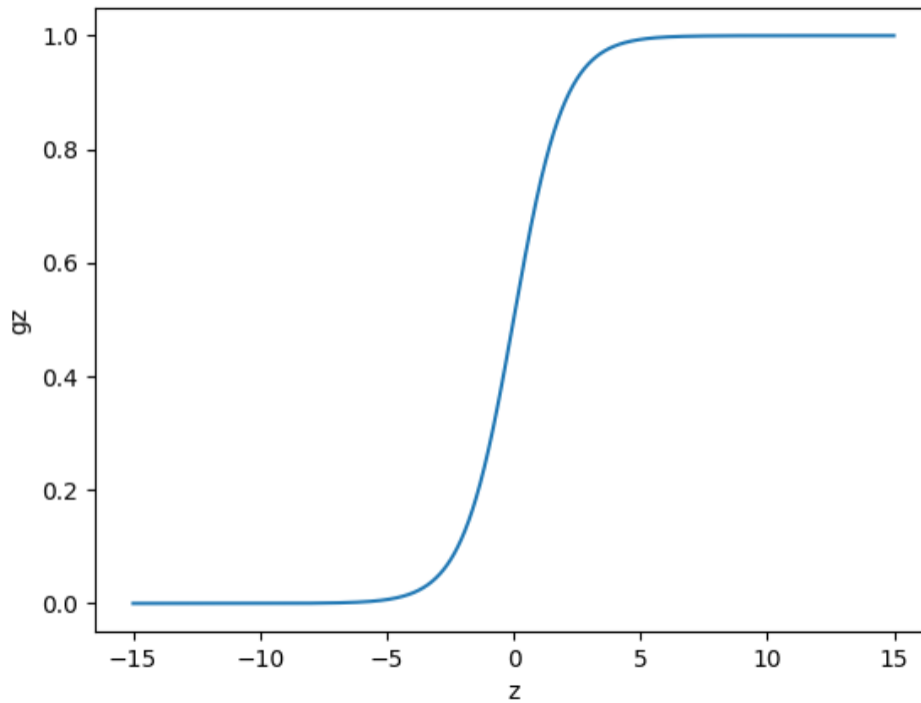
```
Question 1A X.shape: (100, 3)
Question 1A y.shape: (100, 1)
```

- b) See ps3-1-b.png for scatter plot



- c) See ps3.py for code

d) See sigmoid.py for sigmoid function code, ps3-1-c.png for sigmoid plot



```
Question 1D gz=0.1, z=: -2.1972245773362196
```

Sigmoid output reaches 0.1 at around $z = -2.2$

e) See costFunction.py and gradFunction.py for cost and gradient implementations, ps3.py for other code

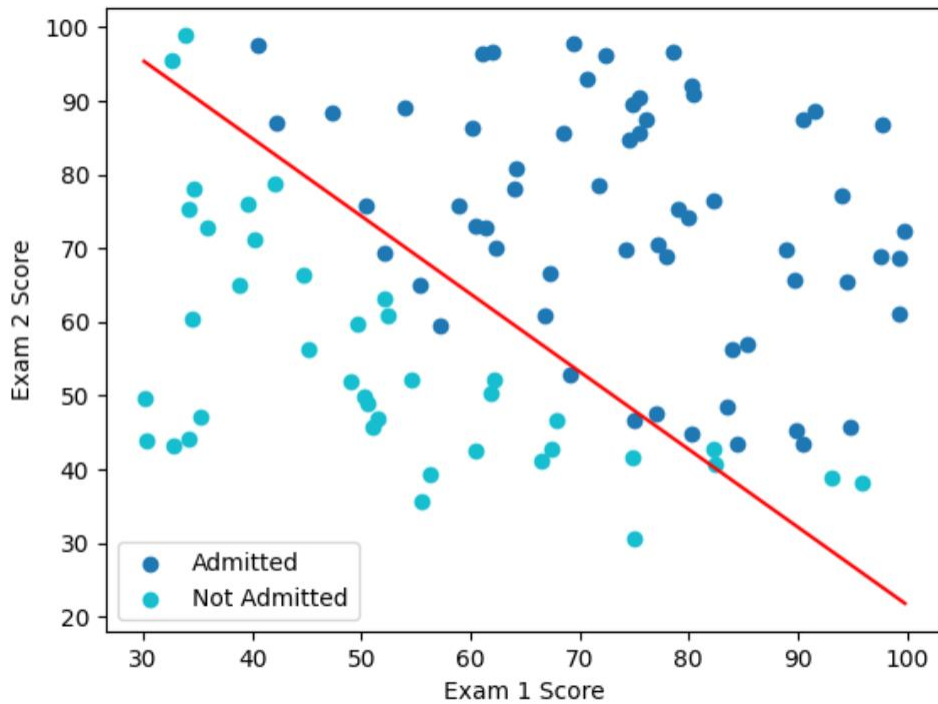
Cost J for toy data set:

```
Question 1E Cost: 1.126928011042972
```

f) See ps3.py for code

```
Question 1F Optimal Theta: [-25.90744373  0.20946215  0.20579368]
Question 1F Cost:
0.19450535058017163
```

g) See ps3-1-f.png for scatter plot + learned line, ps3.py for code



h) See ps3.py for code

```
Question 1H Accuracy: 0.9
```

i) See ps3.py for code

```
Question 1I Probability: 0.556131677754626
Question 1I Decision: 1
```

Decision: Admitted ^

2. a) See ps3.py for code

```
Question 2A theta:  
[[ 2.19256506e+05]  
 [-7.75885823e+02]  
 [ 1.06170506e+01]]
```

- b) See ps3-2-b.png for plot, and ps3.py for code

