Web App Assignment 5

Ruiyu Zhang || rz213

Q1

(1) Source Code

Please check attachment `Q1.py`

(2) Results for $\varepsilon = 0.1$

- learning rate = 0.5, target error = 0.1

```
Please input the expected error: 0.1
Please input the learning rate: 0.5

Initial weights:
Theta1:
[0.6888437030500962, 0.5159088058806 05]
[-0.15885683833831, -0.4821664994140733]
[0.02254944273721704, -0.19013172509917142]
Theta2:
[0.5675971780695452]
[-0.3933745478421451]

first-batch error     0.1528562731414498

final error           0.09990708012694774

the total number of batches run through in the training 596

Final weights:
Theta 1:
[0.8205497350676957, 2.1576600041387537]
[-1.0459614445587426, -1.8469025970949724]
[-0.2482454609405153, 1.1440557337712822]
Theta 2:
[1.4658862263160433]
[-0.9890290929247322]
```

- learning rate = 1.0, target error = 0.1

```
Please input the expected error: 0.1
Please input the learning rate: 1

Initial weights:
Theta1:
[0.6888437030500962, 0.515908805880605]
[-0.15885683833831, -0.4821664994140733]
[0.02254944273721704, -0.19013172509917142]
Theta2:
[0.5675971780695452]
[-0.3933745478421451]

first-batch error     0.1579000632765516

final error           0.09977700044780606

the total number of batches run through in the training 272

Final weights:
Theta 1:
[1.0279513934896456, 1.8319009082529263]
[-1.7694748268661458, -1.8224832559110054]
[-0.4299600384570291, 1.1054533011429584]
Theta 2:
[1.317290213246232]
[-0.7359047098099407]
```

- learning rate = 13.5, target error = 0.1

  Best results so far

```
Please input the expected error: 0.1
Please input the learning rate: 13.5

Initial weights:
Theta1:
[0.6888437030500962, 0.515908805880605]
[-0.15885683833831, -0.4821664994140733]
[0.02254944273721704, -0.19013172509917142]
Theta2:
[0.5675971780695452]
[-0.3933745478421451]

first-batch error     0.4374882062665837
```

```
final error           0.0997763204023906

the total number of batches run through in the training 47

Final weights:
Theta 1:
[2.32695061772044, 0.9589175633352393]
[0.8629674224400499, -5.863019845168982]
[3.5728977108716053, 2.5104340319855685]
Theta 2:
[-1.353927609900898]
[-1.4203468310210978]
```

(3) Results for $\varepsilon = 0.02$

- learning rate = 0.5, target error = 0.02

```
Please input the expected error: 0.02
Please input the learning rate: 0.5

Initial weights:
Theta1:
[0.6888437030500962, 0.5159088058806 05]
[-0.15885683833831, -0.4821664994140733]
[0.02254944273721704, -0.19013172509917142]
Theta2:
[0.5675971780695452]
[-0.3933745478421451]

first-batch error     0.1528562731414498

final error           0.01997390852653124

the total number of batches run through in the training 769

Final weights:
Theta 1:
[2.9845689133076516, 3.987516883454607]
[-3.254099114171056, -3.9920204687248284]
[-1.6497741244311133, 1.5500994890864108]
Theta 2:
[4.733032345426567]
[-2.4343824970285413]
```

- learning rate = 1.0, target error = 0.02

```
Please input the expected error: 0.02
Please input the learning rate: 1.0

Initial weights:
Theta1:
[0.6888437030500962, 0.515908805880605]
[-0.15885683833831, -0.4821664994140733]
[0.02254944273721704, -0.19013172509917142]
Theta2:
[0.5675971780695452]
[-0.3933745478421451]

first-batch error     0.1579000632765516

final error           0.019791107356614202

the total number of batches run through in the training 356

Final weights:
Theta 1:
[3.414936124335938, 3.643757591491449]
[-3.8309918653148705, -3.7774808004538225]
[-1.9220994910353064, 1.4115421531262577]
Theta 2:
[4.6435107168102014]
[-2.3365249580116805]
```

- learning rate = 9, target error = 0.02

  Best results so far

```
Please input the expected error: 0.02
Please input the learning rate: 9

Initial weights:
Theta1:
[0.6888437030500962, 0.515908805880605]
[-0.15885683833831, -0.4821664994140733]
[0.02254944273721704, -0.19013172509917142]
Theta2:
[0.5675971780695452]
[-0.3933745478421451]
```

```
first-batch error     0.3162077960760865

final error           0.016366988202571327

the total number of batches run through in the training 31

Final weights:
Theta 1:
[3.7310477017795676, 4.959864039612585]
[-4.87967014894296, -6.6333247407073905]
[2.01678068741914, -2.8109561103369884]
Theta 2:
[-2.7344201206709706]
[5.670635191696419]
```

Q2

(1) Source Code

Please check attachment `Q2.html`

(2) Demo

file:///Users/duskpiper/development/projects/RU568-Web-App/Assignment%205/Q2.html

This web site will find the volume for a Cylinder, Spherre, or Cone

Select the units (English or SI)
(•) English ( ) SI
Select the shape cylinder
Enter the radius 12
For the cylinder and cone, Enter the height 32
reset the form

Results

You selected to use English units
You selected to find the value for a cylinder shape

Shape	Radius	Height	Volume
	(ft)	(ft)	(ft^3)
cylinder	12	32	14476.032

Click to calculate the results