```
Epoch 778/1000
6/6 [==============================] - 0s 742us/step - loss: 40708756.0000
Epoch 779/1000
6/6 [==============================] - 0s 995us/step - loss: 40695668.0000
Epoch 780/1000
6/6 [==============================] - 0s 1ms/step - loss: 40687012.0000
Epoch 781/1000
6/6 [==============================] - 0s 1ms/step - loss: 40678904.0000
Epoch 782/1000
6/6 [==============================] - 0s 1ms/step - loss: 40669904.0000
Epoch 783/1000
6/6 [==============================] - 0s 1ms/step - loss: 40659316.0000
Epoch 784/1000
6/6 [==============================] - 0s 850us/step - loss: 40650284.0000
Epoch 785/1000
6/6 [==============================] - 0s 1ms/step - loss: 40654396.0000
Epoch 786/1000
6/6 [==============================] - 0s 1000us/step - loss: 40630716.0000
Epoch 787/1000
6/6 [==============================] - 0s 914us/step - loss: 40622588.0000
Epoch 788/1000
6/6 [==============================] - 0s 1ms/step - loss: 40613268.0000
Epoch 789/1000
6/6 [==============================] - 0s 865us/step - loss: 40616436.0000
Epoch 790/1000
6/6 [==============================] - 0s 922us/step - loss: 40589924.0000
Epoch 791/1000
6/6 [==============================] - 0s 1000us/step - loss: 40582664.0000
Epoch 792/1000
6/6 [==============================] - 0s 796us/step - loss: 40574044.0000
Epoch 793/1000
6/6 [==============================] - 0s 935us/step - loss: 40562952.0000
Epoch 794/1000
6/6 [==============================] - 0s 1ms/step - loss: 40556152.0000
Epoch 795/1000
6/6 [==============================] - 0s 808us/step - loss: 40546856.0000
Epoch 796/1000
6/6 [==============================] - 0s 1ms/step - loss: 40537620.0000
Epoch 797/1000
6/6 [==============================] - 0s 810us/step - loss: 40526808.0000
Epoch 798/1000
6/6 [==============================] - 0s 896us/step - loss: 40516024.0000
Epoch 799/1000
6/6 [==============================] - 0s 993us/step - loss: 40509836.0000
Epoch 800/1000
6/6 [==============================] - 0s 801us/step - loss: 40506444.0000
Epoch 801/1000
6/6 [==============================] - 0s 1ms/step - loss: 40493560.0000
Epoch 802/1000
6/6 [==============================] - 0s 803us/step - loss: 40482712.0000
Epoch 803/1000
6/6 [==============================] - 0s 767us/step - loss: 40478392.0000
Epoch 804/1000
6/6 [==============================] - 0s 814us/step - loss: 40462604.0000
Epoch 805/1000
6/6 [==============================] - 0s 1ms/step - loss: 40459944.0000
Epoch 806/1000
6/6 [==============================] - 0s 848us/step - loss: 40444292.0000
Epoch 807/1000
```

```
6/6 [==============================] - 0s 1ms/step - loss: 40441208.0000
Epoch 808/1000
6/6 [==============================] - 0s 881us/step - loss: 40428664.0000
Epoch 809/1000
6/6 [==============================] - 0s 1ms/step - loss: 40420924.0000
Epoch 810/1000
6/6 [==============================] - 0s 801us/step - loss: 40410424.0000
Epoch 811/1000
6/6 [==============================] - 0s 967us/step - loss: 40403060.0000
Epoch 812/1000
6/6 [==============================] - 0s 1ms/step - loss: 40393164.0000
Epoch 813/1000
6/6 [==============================] - 0s 926us/step - loss: 40386536.0000
Epoch 814/1000
6/6 [==============================] - 0s 798us/step - loss: 40382364.0000
Epoch 815/1000
6/6 [==============================] - 0s 787us/step - loss: 40365916.0000
Epoch 816/1000
6/6 [==============================] - 0s 944us/step - loss: 40372344.0000
Epoch 817/1000
6/6 [==============================] - 0s 802us/step - loss: 40350024.0000
Epoch 818/1000
6/6 [==============================] - 0s 782us/step - loss: 40340360.0000
Epoch 819/1000
6/6 [==============================] - 0s 838us/step - loss: 40337136.0000
Epoch 820/1000
6/6 [==============================] - 0s 853us/step - loss: 40327896.0000
Epoch 821/1000
6/6 [==============================] - 0s 891us/step - loss: 40320060.0000
Epoch 822/1000
6/6 [==============================] - 0s 802us/step - loss: 40314352.0000
Epoch 823/1000
6/6 [==============================] - 0s 795us/step - loss: 40301532.0000
Epoch 824/1000
6/6 [==============================] - 0s 910us/step - loss: 40290504.0000
Epoch 825/1000
6/6 [==============================] - 0s 777us/step - loss: 40280884.0000
Epoch 826/1000
6/6 [==============================] - 0s 712us/step - loss: 40273920.0000
Epoch 827/1000
6/6 [==============================] - 0s 1ms/step - loss: 40270088.0000
Epoch 828/1000
6/6 [==============================] - 0s 981us/step - loss: 40256864.0000
Epoch 829/1000
6/6 [==============================] - 0s 732us/step - loss: 40249500.0000
Epoch 830/1000
6/6 [==============================] - 0s 1ms/step - loss: 40246504.0000
Epoch 831/1000
6/6 [==============================] - 0s 974us/step - loss: 40234412.0000
Epoch 832/1000
6/6 [==============================] - 0s 1ms/step - loss: 40228916.0000
Epoch 833/1000
6/6 [==============================] - 0s 1ms/step - loss: 40218068.0000
Epoch 834/1000
6/6 [==============================] - 0s 785us/step - loss: 40211824.0000
Epoch 835/1000
6/6 [==============================] - 0s 800us/step - loss: 40204912.0000
Epoch 836/1000
6/6 [==============================] - 0s 879us/step - loss: 40203448.0000
```

```
Epoch 837/1000
6/6 [==============================] - 0s 1000us/step - loss: 40191576.0000
Epoch 838/1000
6/6 [==============================] - 0s 822us/step - loss: 40177812.0000
Epoch 839/1000
6/6 [==============================] - 0s 811us/step - loss: 40178520.0000
Epoch 840/1000
6/6 [==============================] - 0s 824us/step - loss: 40170532.0000
Epoch 841/1000
6/6 [==============================] - 0s 949us/step - loss: 40157460.0000
Epoch 842/1000
6/6 [==============================] - 0s 999us/step - loss: 40153360.0000
Epoch 843/1000
6/6 [==============================] - 0s 923us/step - loss: 40144692.0000
Epoch 844/1000
6/6 [==============================] - 0s 1ms/step - loss: 40139248.0000
Epoch 845/1000
6/6 [==============================] - 0s 1ms/step - loss: 40125044.0000
Epoch 846/1000
6/6 [==============================] - 0s 758us/step - loss: 40115008.0000
Epoch 847/1000
6/6 [==============================] - 0s 1ms/step - loss: 40118584.0000
Epoch 848/1000
6/6 [==============================] - 0s 911us/step - loss: 40102308.0000
Epoch 849/1000
6/6 [==============================] - 0s 802us/step - loss: 40093504.0000
Epoch 850/1000
6/6 [==============================] - 0s 998us/step - loss: 40085192.0000
Epoch 851/1000
6/6 [==============================] - 0s 824us/step - loss: 40077324.0000
Epoch 852/1000
6/6 [==============================] - 0s 1000us/step - loss: 40076416.0000
Epoch 853/1000
6/6 [==============================] - 0s 913us/step - loss: 40065272.0000
Epoch 854/1000
6/6 [==============================] - 0s 1ms/step - loss: 40055008.0000
Epoch 855/1000
6/6 [==============================] - 0s 882us/step - loss: 40050504.0000
Epoch 856/1000
6/6 [==============================] - 0s 845us/step - loss: 40043664.0000
Epoch 857/1000
6/6 [==============================] - 0s 979us/step - loss: 40033228.0000
Epoch 858/1000
6/6 [==============================] - 0s 941us/step - loss: 40026952.0000
Epoch 859/1000
6/6 [==============================] - 0s 801us/step - loss: 40020504.0000
Epoch 860/1000
6/6 [==============================] - 0s 1ms/step - loss: 40012548.0000
Epoch 861/1000
6/6 [==============================] - 0s 831us/step - loss: 40003888.0000
Epoch 862/1000
6/6 [==============================] - 0s 921us/step - loss: 39996068.0000
Epoch 863/1000
6/6 [==============================] - 0s 908us/step - loss: 39992840.0000
Epoch 864/1000
6/6 [==============================] - 0s 1ms/step - loss: 39982204.0000
Epoch 865/1000
6/6 [==============================] - 0s 997us/step - loss: 39976288.0000
Epoch 866/1000
```

```
6/6 [==============================] - 0s 769us/step - loss: 39969292.0000
Epoch 867/1000
6/6 [==============================] - 0s 981us/step - loss: 39964484.0000
Epoch 868/1000
6/6 [==============================] - 0s 802us/step - loss: 39957848.0000
Epoch 869/1000
6/6 [==============================] - 0s 823us/step - loss: 39947284.0000
Epoch 870/1000
6/6 [==============================] - 0s 788us/step - loss: 39941636.0000
Epoch 871/1000
6/6 [==============================] - 0s 945us/step - loss: 39931780.0000
Epoch 872/1000
6/6 [==============================] - 0s 1ms/step - loss: 39925148.0000
Epoch 873/1000
6/6 [==============================] - 0s 842us/step - loss: 39926060.0000
Epoch 874/1000
6/6 [==============================] - 0s 1ms/step - loss: 39909576.0000
Epoch 875/1000
6/6 [==============================] - 0s 819us/step - loss: 39906384.0000
Epoch 876/1000
6/6 [==============================] - 0s 948us/step - loss: 39897944.0000
Epoch 877/1000
6/6 [==============================] - 0s 1ms/step - loss: 39891608.0000
Epoch 878/1000
6/6 [==============================] - 0s 876us/step - loss: 39888168.0000
Epoch 879/1000
6/6 [==============================] - 0s 770us/step - loss: 39878916.0000
Epoch 880/1000
6/6 [==============================] - 0s 1ms/step - loss: 39875424.0000
Epoch 881/1000
6/6 [==============================] - 0s 809us/step - loss: 39861904.0000
Epoch 882/1000
6/6 [==============================] - 0s 801us/step - loss: 39855644.0000
Epoch 883/1000
6/6 [==============================] - 0s 1ms/step - loss: 39860108.0000
Epoch 884/1000
6/6 [==============================] - 0s 955us/step - loss: 39843416.0000
Epoch 885/1000
6/6 [==============================] - 0s 1ms/step - loss: 39842008.0000
Epoch 886/1000
6/6 [==============================] - 0s 890us/step - loss: 39831464.0000
Epoch 887/1000
6/6 [==============================] - 0s 1ms/step - loss: 39823208.0000
Epoch 888/1000
6/6 [==============================] - 0s 784us/step - loss: 39816228.0000
Epoch 889/1000
6/6 [==============================] - 0s 972us/step - loss: 39825184.0000
Epoch 890/1000
6/6 [==============================] - 0s 998us/step - loss: 39803932.0000
Epoch 891/1000
6/6 [==============================] - 0s 799us/step - loss: 39798472.0000
Epoch 892/1000
6/6 [==============================] - 0s 1ms/step - loss: 39795912.0000
Epoch 893/1000
6/6 [==============================] - 0s 805us/step - loss: 39781764.0000
Epoch 894/1000
6/6 [==============================] - 0s 1ms/step - loss: 39779924.0000
Epoch 895/1000
6/6 [==============================] - 0s 800us/step - loss: 39770100.0000
```

```
Epoch 896/1000
6/6 [==============================] - 0s 980us/step - loss: 39761856.0000
Epoch 897/1000
6/6 [==============================] - 0s 1ms/step - loss: 39759324.0000
Epoch 898/1000
6/6 [==============================] - 0s 819us/step - loss: 39753504.0000
Epoch 899/1000
6/6 [==============================] - 0s 945us/step - loss: 39742860.0000
Epoch 900/1000
6/6 [==============================] - 0s 1ms/step - loss: 39746368.0000
Epoch 901/1000
6/6 [==============================] - 0s 868us/step - loss: 39732668.0000
Epoch 902/1000
6/6 [==============================] - 0s 1ms/step - loss: 39727844.0000
Epoch 903/1000
6/6 [==============================] - 0s 819us/step - loss: 39719344.0000
Epoch 904/1000
6/6 [==============================] - 0s 971us/step - loss: 39711852.0000
Epoch 905/1000
6/6 [==============================] - 0s 1ms/step - loss: 39707692.0000
Epoch 906/1000
6/6 [==============================] - 0s 950us/step - loss: 39698208.0000
Epoch 907/1000
6/6 [==============================] - 0s 987us/step - loss: 39700088.0000
Epoch 908/1000
6/6 [==============================] - 0s 942us/step - loss: 39687472.0000
Epoch 909/1000
6/6 [==============================] - 0s 990us/step - loss: 39680304.0000
Epoch 910/1000
6/6 [==============================] - 0s 872us/step - loss: 39676424.0000
Epoch 911/1000
6/6 [==============================] - 0s 826us/step - loss: 39668504.0000
Epoch 912/1000
6/6 [==============================] - 0s 799us/step - loss: 39663972.0000
Epoch 913/1000
6/6 [==============================] - 0s 932us/step - loss: 39655284.0000
Epoch 914/1000
6/6 [==============================] - 0s 813us/step - loss: 39649900.0000
Epoch 915/1000
6/6 [==============================] - 0s 829us/step - loss: 39647624.0000
Epoch 916/1000
6/6 [==============================] - 0s 849us/step - loss: 39651356.0000
Epoch 917/1000
6/6 [==============================] - 0s 805us/step - loss: 39636704.0000
Epoch 918/1000
6/6 [==============================] - 0s 800us/step - loss: 39628372.0000
Epoch 919/1000
6/6 [==============================] - 0s 1ms/step - loss: 39622516.0000
Epoch 920/1000
6/6 [==============================] - 0s 820us/step - loss: 39612972.0000
Epoch 921/1000
6/6 [==============================] - 0s 908us/step - loss: 39611920.0000
Epoch 922/1000
6/6 [==============================] - 0s 828us/step - loss: 39602168.0000
Epoch 923/1000
6/6 [==============================] - 0s 992us/step - loss: 39597860.0000
Epoch 924/1000
6/6 [==============================] - 0s 882us/step - loss: 39589448.0000
Epoch 925/1000
```

```
6/6 [==============================] - 0s 888us/step - loss: 39583920.0000
Epoch 926/1000
6/6 [==============================] - 0s 924us/step - loss: 39577456.0000
Epoch 927/1000
6/6 [==============================] - 0s 896us/step - loss: 39576728.0000
Epoch 928/1000
6/6 [==============================] - 0s 800us/step - loss: 39567408.0000
Epoch 929/1000
6/6 [==============================] - 0s 1ms/step - loss: 39563668.0000
Epoch 930/1000
6/6 [==============================] - 0s 804us/step - loss: 39554272.0000
Epoch 931/1000
6/6 [==============================] - 0s 723us/step - loss: 39549412.0000
Epoch 932/1000
6/6 [==============================] - 0s 980us/step - loss: 39545080.0000
Epoch 933/1000
6/6 [==============================] - 0s 1ms/step - loss: 39538576.0000
Epoch 934/1000
6/6 [==============================] - 0s 832us/step - loss: 39531580.0000
Epoch 935/1000
6/6 [==============================] - 0s 1ms/step - loss: 39534612.0000
Epoch 936/1000
6/6 [==============================] - 0s 853us/step - loss: 39520688.0000
Epoch 937/1000
6/6 [==============================] - 0s 988us/step - loss: 39516788.0000
Epoch 938/1000
6/6 [==============================] - 0s 861us/step - loss: 39517192.0000
Epoch 939/1000
6/6 [==============================] - 0s 1ms/step - loss: 39503032.0000
Epoch 940/1000
6/6 [==============================] - 0s 998us/step - loss: 39499636.0000
Epoch 941/1000
6/6 [==============================] - 0s 725us/step - loss: 39508512.0000
Epoch 942/1000
6/6 [==============================] - 0s 1000us/step - loss: 39488720.0000
Epoch 943/1000
6/6 [==============================] - 0s 1ms/step - loss: 39480728.0000
Epoch 944/1000
6/6 [==============================] - 0s 987us/step - loss: 39474452.0000
Epoch 945/1000
6/6 [==============================] - 0s 798us/step - loss: 39467656.0000
Epoch 946/1000
6/6 [==============================] - 0s 910us/step - loss: 39468240.0000
Epoch 947/1000
6/6 [==============================] - 0s 800us/step - loss: 39457036.0000
Epoch 948/1000
6/6 [==============================] - 0s 1ms/step - loss: 39456544.0000
Epoch 949/1000
6/6 [==============================] - 0s 947us/step - loss: 39447460.0000
Epoch 950/1000
6/6 [==============================] - 0s 798us/step - loss: 39440652.0000
Epoch 951/1000
6/6 [==============================] - 0s 992us/step - loss: 39438740.0000
Epoch 952/1000
6/6 [==============================] - 0s 823us/step - loss: 39441616.0000
Epoch 953/1000
6/6 [==============================] - 0s 1ms/step - loss: 39426084.0000
Epoch 954/1000
6/6 [==============================] - 0s 932us/step - loss: 39419436.0000
```

```
Epoch 955/1000
6/6 [==============================] - 0s 801us/step - loss: 39418820.0000
Epoch 956/1000
6/6 [==============================] - 0s 809us/step - loss: 39408532.0000
Epoch 957/1000
6/6 [==============================] - 0s 962us/step - loss: 39403956.0000
Epoch 958/1000
6/6 [==============================] - 0s 999us/step - loss: 39402196.0000
Epoch 959/1000
6/6 [==============================] - 0s 941us/step - loss: 39397056.0000
Epoch 960/1000
6/6 [==============================] - 0s 790us/step - loss: 39395216.0000
Epoch 961/1000
6/6 [==============================] - 0s 1ms/step - loss: 39384004.0000
Epoch 962/1000
6/6 [==============================] - 0s 901us/step - loss: 39378264.0000
Epoch 963/1000
6/6 [==============================] - 0s 800us/step - loss: 39382704.0000
Epoch 964/1000
6/6 [==============================] - 0s 1ms/step - loss: 39365540.0000
Epoch 965/1000
6/6 [==============================] - 0s 714us/step - loss: 39368088.0000
Epoch 966/1000
6/6 [==============================] - 0s 980us/step - loss: 39355800.0000
Epoch 967/1000
6/6 [==============================] - 0s 964us/step - loss: 39354776.0000
Epoch 968/1000
6/6 [==============================] - 0s 787us/step - loss: 39344680.0000
Epoch 969/1000
6/6 [==============================] - 0s 712us/step - loss: 39341424.0000
Epoch 970/1000
6/6 [==============================] - 0s 800us/step - loss: 39334992.0000
Epoch 971/1000
6/6 [==============================] - 0s 842us/step - loss: 39333392.0000
Epoch 972/1000
6/6 [==============================] - 0s 736us/step - loss: 39324528.0000
Epoch 973/1000
6/6 [==============================] - 0s 789us/step - loss: 39323728.0000
Epoch 974/1000
6/6 [==============================] - 0s 999us/step - loss: 39313420.0000
Epoch 975/1000
6/6 [==============================] - 0s 833us/step - loss: 39312824.0000
Epoch 976/1000
6/6 [==============================] - 0s 890us/step - loss: 39303888.0000
Epoch 977/1000
6/6 [==============================] - 0s 729us/step - loss: 39299792.0000
Epoch 978/1000
6/6 [==============================] - 0s 980us/step - loss: 39293460.0000
Epoch 979/1000
6/6 [==============================] - 0s 1ms/step - loss: 39291836.0000
Epoch 980/1000
6/6 [==============================] - 0s 847us/step - loss: 39287488.0000
Epoch 981/1000
6/6 [==============================] - 0s 852us/step - loss: 39285292.0000
Epoch 982/1000
6/6 [==============================] - 0s 1ms/step - loss: 39279060.0000
Epoch 983/1000
6/6 [==============================] - 0s 798us/step - loss: 39269036.0000
Epoch 984/1000
```

```
6/6 [==============================] - 0s 998us/step - loss: 39265220.0000
Epoch 985/1000
6/6 [==============================] - 0s 2ms/step - loss: 39257784.0000
Epoch 986/1000
6/6 [==============================] - 0s 924us/step - loss: 39254684.0000
Epoch 987/1000
6/6 [==============================] - 0s 811us/step - loss: 39250884.0000
Epoch 988/1000
6/6 [==============================] - 0s 998us/step - loss: 39245976.0000
Epoch 989/1000
6/6 [==============================] - 0s 931us/step - loss: 39239084.0000
Epoch 990/1000
6/6 [==============================] - 0s 1ms/step - loss: 39238616.0000
Epoch 991/1000
6/6 [==============================] - 0s 1ms/step - loss: 39228120.0000
Epoch 992/1000
6/6 [==============================] - 0s 1ms/step - loss: 39224556.0000
Epoch 993/1000
6/6 [==============================] - 0s 800us/step - loss: 39225028.0000
Epoch 994/1000
6/6 [==============================] - 0s 995us/step - loss: 39213704.0000
Epoch 995/1000
6/6 [==============================] - 0s 904us/step - loss: 39214608.0000
Epoch 996/1000
6/6 [==============================] - 0s 1ms/step - loss: 39208292.0000
Epoch 997/1000
6/6 [==============================] - 0s 821us/step - loss: 39206960.0000
Epoch 998/1000
6/6 [==============================] - 0s 212us/step - loss: 39205316.0000
Epoch 999/1000
6/6 [==============================] - 0s 2ms/step - loss: 39191684.0000
Epoch 1000/1000
6/6 [==============================] - 0s 2ms/step - loss: 39184868.0000


********** ANN training complete **********



******* WEIGHTS OF ANN *******

Weights W0:
 [[3.403694   3.075585   3.0070298  3.404669  ]
 [0.9210794  0.55378467 0.65832984 1.1319507 ]
 [3.3602848  3.964342   3.752914   2.7538948 ]
 [2.0072436  1.8732651  2.93709    2.393149  ]
 [4.305574   4.9481816  4.9937296  4.2898507 ]
 [4.7575746  4.9845557  4.7338347  4.833948  ]]
Bias b0:
 [4.6615386 4.8734465 4.955996  4.625056 ]
Weights W1:
 [[ 0.68883914  2.4887607  -0.605471    2.824834  ]
 [-0.5815831   3.2751265  -0.6252498   2.5087445 ]
 [-0.7868391   2.587593    0.18852456  2.3928082 ]
 [-0.6383406   2.0626142  -0.12354828  1.0656595 ]]
Bias b1:
 [ 0.         4.10615    -0.02406734  3.8436544 ]
Weights W2:
 [[-0.98849607]
```

```
 [ 2.4027445 ]
 [-0.04952754]
 [ 3.2559335 ]]
Bias b2:
 [2.788389]


********** Press ENTER to start using the ANN **********


1/1 [==============================] - 0s 68ms/step

*****************************************
ANN Predicted number of passengers departing from Newark Liberty International Airport:
17889
*****************************************



***** ANN MODEL SUCCESSFULLY SAVED AS Super.h5 *****
C:\Users\hskay\OneDrive\Documents\Master\Semester I\Artificial Intelligence for Engineering
Applications\Projects\myproject\pro_5_ann\pro_5_ann_nwk_flights\Newark_departures.py:174:
DeprecationWarning: Conversion of an array with ndim > 0 to a scalar is deprecated, and will
error in future. Ensure you extract a single element from your array before performing this
operation. (Deprecated NumPy 1.25.)
  print('ANN Predicted number of passengers departing from Newark Liberty International
Airport: ', int (prediction))
C:\Users\hskay\anaconda3\lib\site-packages\keras\src\engine\training.py:3000: UserWarning:
You are saving your model as an HDF5 file via `model.save()`. This file format is considered
legacy. We recommend using instead the native Keras format, e.g.
`model.save('my_model.keras')`.
  saving_api.save_model(
```

In [3]:
Out[3]: 'C:\\Users\\hskay\\OneDrive\\Documents\\Master\\Semester I\\Artificial Intelligence
for Engineering Applications\\Projects\\myproject\\pro_5_ann\\pro_5_ann_nwk_flights'

In [4]: