Post_Processing

April 11, 2023

1 Question (1) (d):

1.1 Plot contours of the solution with appropriate x-y coordinates.

2 Answer (1) (d):

3 Import the necessary libraries

[1]:
```
import numpy as np;
import matplotlib.pyplot as plt;
import seaborn as sns;
import pandas as pd;
```

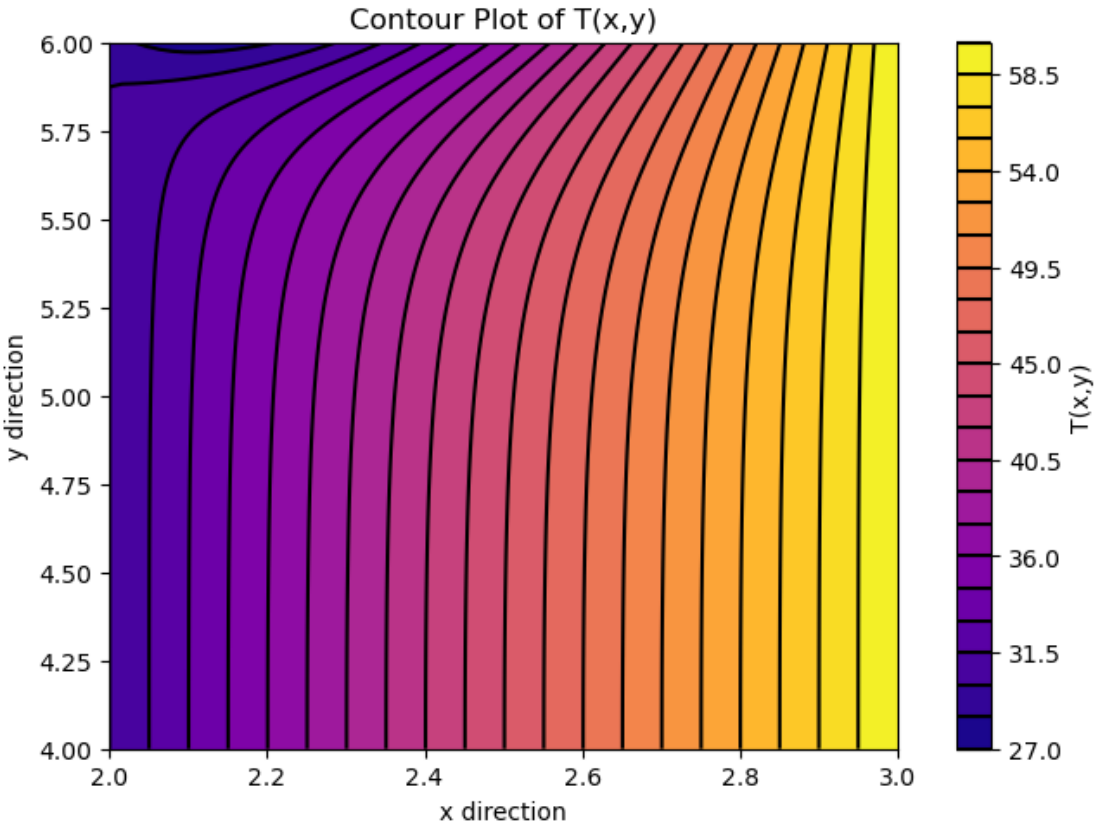
4 Reading the solution files

[2]:
```
Sol = pd.read_csv("Question_1_Solution.csv",header=None);
```

5 Plotting the contour plot

[3]:
```
xlist = np.linspace(2.0, 3.0, Sol.shape[1])
ylist = np.linspace(4, 6.0, Sol.shape[0])
X, Y = np.meshgrid(xlist, ylist)
fig1, ax2 = plt.subplots(layout='constrained')
CS = ax2.contourf(X, Y, Sol, 25, cmap='plasma')
CS2 = ax2.contour(CS, levels=CS.levels[::1], colors='k')

ax2.set_title('Contour Plot of T(x,y)')
ax2.set_xlabel('x direction')
ax2.set_ylabel('y direction')
cbar = fig1.colorbar(CS)
cbar.ax.set_ylabel('T(x,y)')
cbar.add_lines(CS2)
fig1.savefig("Question_1_Contour_Plot.png",dpi= 1000)
```



5.1 In some regions of the computational domain, T(x,y) is less than 30 (in the upper left corner of the contour plot). This is happening because of the negative value of $\frac{\partial T}{\partial y}$ in that region.