9021 assignment2 copy for part2(5.24)

# Insert your code here

# written by Jiaquan Xu

import os

class FriezeError(Exception):

def \_\_init\_\_(self, message):

self.message = message

class FileNotFoundError(Exception):

def \_\_init\_\_(self, message):

self.message = message

class Frieze():

def \_\_init\_\_(self, filename):

self.file = filename

if os.path.exists(self.file) == False:

raise FileNotFoundError('File Not Found')

with open(self.file) as datafile:

self.L = []

for line in datafile:

LL = []

for s in line.split(' '):

if s == '\n' or s == '':

continue

else:

if s.isdigit:

if int(s) >= 0 and int(s) <= 15:

LL.append(int(s))

if len(LL):

self.L.append(LL)

if len(self.L) < 3 or len(self.L) > 17 or len(self.L[0]) < 5 or len(self.L[0]) > 51 :

raise FriezeError('Incorrect input.')

for i in range(len(self.L)-1):

if len(self.L[i]) != len(self.L[i+1]):

raise FriezeError('Incorrect input.')

for i in range(len(self.L)):

if self.L[i][-1] != 0 and self.L[i][-1] != 1:

raise FriezeError('Input does not represent a frieze.')

for j in range(len(self.L)):

if self.L[0][j] not in [0,4,8,12] or self.L[-1][j] not in [0,1,2,3,4,5,6,7]:

raise FriezeError('Input does not represent a frieze.')

def display(self):

new\_file = self.file[:-4] + '.tex'

with open(new\_file, 'w') as output\_file:

print(r'''\documentclass[10pt]{article}

\usepackage{tikz}

\usepackage[margin=0cm]{geometry}

\pagestyle{empty}

\begin{document}

\vspace\*{\fill}

\begin{center}

\begin{tikzpicture}[x=0.2cm, y=-0.2cm, thick, purple]''', file = output\_file)

print(r'''% North to South lines''', file = output\_file)

L = self.L

# for i in range(len(L)):

# print(L[i])

for j in range(len(L[0])):

L1 = []

for i in range(1, len(L)):

if L[i][j] % 2 == 1:

L1.append(i-1)

L1.append(i)

if not L1:

continue

elif len(L1) < 3:

print(f' \draw ({j},{L1[0]}) -- ({j},{L1[1]});', file = output\_file)

else:

L2 = [L1[0]]

for k in range(1, len(L1)-1):

if L1[k] == L1[k-1] or L1[k] == L1[k+1]:

continue

else:

L2.append(L1[k])

L2.append(L1[-1])

for k in range(0,len(L2),2):

print(f' \draw ({j},{L2[k]}) -- ({j},{L2[k+1]});', file = output\_file)

# print(f'{j}L1 is:',L1)

# print(f'{j}L2 is:',L2)

print(r'''% North-West to South-East lines''', file = output\_file)

S1 = set()

for i in range(len(L)-1):

for j in range(len(L[0])-1):

if (i,j) in S1:

continue

if L[i][j] in [8,9,10,11,12,13,14,15]:

S1.add((i,j))

k = 0

while L[i+k][j+k] in [8,9,10,11,12,13,14,15]:

k += 1

S1.add((i+k,j+k))

print(f' \draw ({j},{i}) -- ({j+k},{i+k});', file = output\_file)

print(r'''% West to East lines''', file = output\_file)

for i in range(len(L)):

L1 = []

for j in range(0, len(L[0])-1):

if L[i][j] in [4,5,6,7,12,13,14,15]:

L1.append(j)

L1.append(j+1)

if not L1:

continue

elif len(L1) < 3:

print(f' \draw ({L1[0]},{i}) -- ({L1[1]},{i});', file = output\_file)

else:

L2 = [L1[0]]

for k in range(1, len(L1)-1):

if L1[k] == L1[k-1] or L1[k] == L1[k+1]:

continue

else:

L2.append(L1[k])

L2.append(L1[-1])

for k in range(0,len(L2),2):

print(f' \draw ({L2[k]},{i}) -- ({L2[k+1]},{i});', file = output\_file)

print(r'''% South-West to North-East lines''', file = output\_file)

S1 = set()

L2 = []

for i in range(len(L)-1,0,-1):

for j in range(len(L[0])-2,-1,-1):

if (i,j) in S1:

continue

if L[i][j] in [2,3,6,7,10,11,14,15]:

S1.add((i,j))

k = 0

while L[i-k][j+k] in [2,3,6,7,10,11,14,15]:

k += 1

S1.add((i-k,j+k))

L2.append((j,i))

L2.append((j+k,i-k))

for t in range(len(L2)-1,-1,-2):

print(f' \draw ({L2[t-1][0]},{L2[t-1][1]}) -- ({L2[t][0]},{L2[t][1]});', file = output\_file)

print(r'''\end{tikzpicture}

\end{center}

\vspace\*{\fill}

\end{document}''', file = output\_file)