In [ ]:
```
import numpy as np
import matplotlib.pyplot as plt

print(" "*25,"Atul_Arya\n"," "*24,"CSC/22/11\n","-"*60,
'''
Problem!
obj = 12*x + 16*y
10*x + 20*y <= 120
8*x + 8*y <= 80
''')

# forming problem
def objective_function(x, y):
    return 12*x + 16*y
def constraint1(x1):
    return 6 - 0.5*x1
def constraint2(x2):
    return 10 - x2

x_range = 12-2*0
y_range = 10-0

#slicing array
def slicing(array1,array2):
    Slen = min(len(array1),len(array2))
    array1 = array1[:Slen]
    array2 = array2[:Slen]
    return array1,array2

#Defining coordinates
x1 = np.linspace(0,x_range,(x_range+1)*10)
x2 = np.linspace(0,y_range,(y_range+1)*10)
y1 = constraint1(x1)
y2 = constraint2(x2)
plt.plot(x1, y1, label="10x + 20y <= 120")
plt.plot(x2, y2, label="8x + 8y <= 80")

x1,x2 = slicing(x1,x2)
y1,y2 = slicing(y1,y2)


#Finding feasible_region coordinates
x = np.minimum(x1,x2)
y = np.minimum(y1,y2)

#plot objective function z = 3x + 2y

plt.fill_between(x,y,color="orange",label="Feasible")
plt.legend()
plt.grid(True)

# #solution
def solution(x,y):
    z = objective_function(x,y)
```

```
    max_index = np.argmax(z)
    print(f"Solution! \nX = {x[max_index]} \nY = {y[max_index]} \n{z[max_inc

solution(x,y)
```

```
                          Atul_Arya
                          CSC/22/11
 ------------------------------------------------------------
Problem!
obj = 12*x + 16*y
10*x + 20*y <= 120
8*x + 8*y <= 80

Solution!
X = 8.073394495412845
Y = 1.9069767441860463
127.39236185193089
```