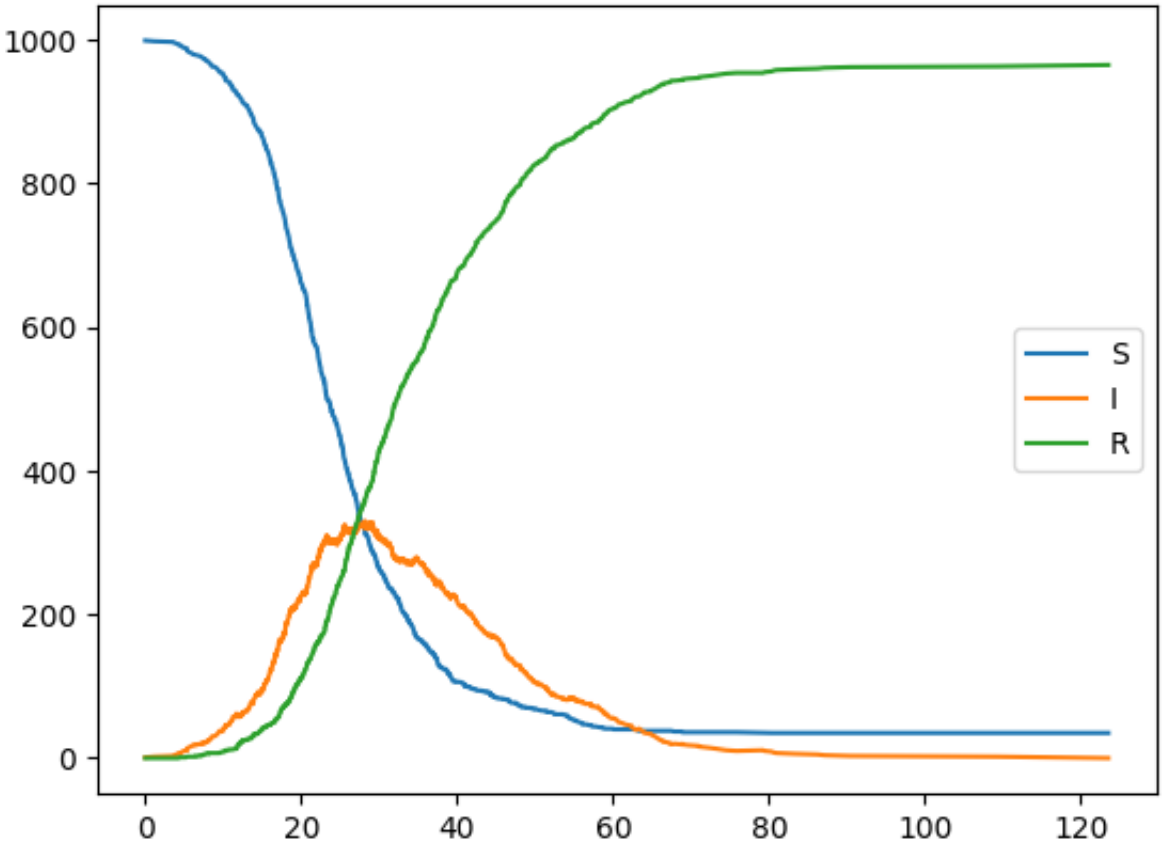
In [84]:
```
import numpy as np
import matplotlib.pyplot as plt
```

In [86]:
```
t=[0]
S=999
I=1
R=0
beta=0.0003
mu=0.1
t_all=[]
S_all=[]
I_all=[]
R_all=[]
fig = plt.figure()
for i in range(3000):
    t_all.append(t[0])
    S_all.append(S)
    I_all.append(I)
    R_all.append(R)
    if I==0:
        break
    r1=np.random.rand(1)
    r2=np.random.rand(1)
    t=t+1/(beta*S*I+mu*I)*np.log(1/r1)
    if r2<beta*S*I/(beta*S*I+mu*I):
        S=S-1
        I=I+1
    else:
        I=I-1
        R=R+1
plt.plot(t_all,S_all,label='S')
plt.plot(t_all,I_all,label='I')
plt.plot(t_all,R_all,label='R')
plt.legend()
plt.show()
```



In [ ]:

In [ ]: