```
import numpy as np

def BDM(p, q, m, t):
  s = p+q
  dt = m*p*s**2*np.exp(-s*t)/(p+q*np.exp(-s*t))**2
  Dt = m*(1-np.exp(-s*t))/(1+q/p*np.exp(-s*t))

  return round(dt, 2), round(Dt, 2)

def BDM_Peak(p, q, m):
  s = p+q
  t_star = 1/s*np.log(q/p)
  dt_star = m*s**2/(4*q)
  Dt_star = m*(q-p)/(2*q)

  return round(t_star, 2), round(dt_star, 2), round(Dt_star, 2)
```

```
p = 0.01; q = 0.65; m = 5000
t = 5

result1 = BDM(p, q, m, t)
print(f'Demand rate and cumulative demand at week {t} are {result1[0]} and {result1[1]}.')

result2 = BDM_Peak(p, q, m)
print(f'Peak demand time, peak demand rate, and cumulative demand at peak time are {result2[0]}, {result2[1]}, and {result2[2]} r
```

```
Demand rate and cumulative demand at week 5 are 695.97 and 1417.43.
Peak demand time, peak demand rate, and cumulative demand at peak time are 6.32, 837.69, and 2461.54 respectively.
```

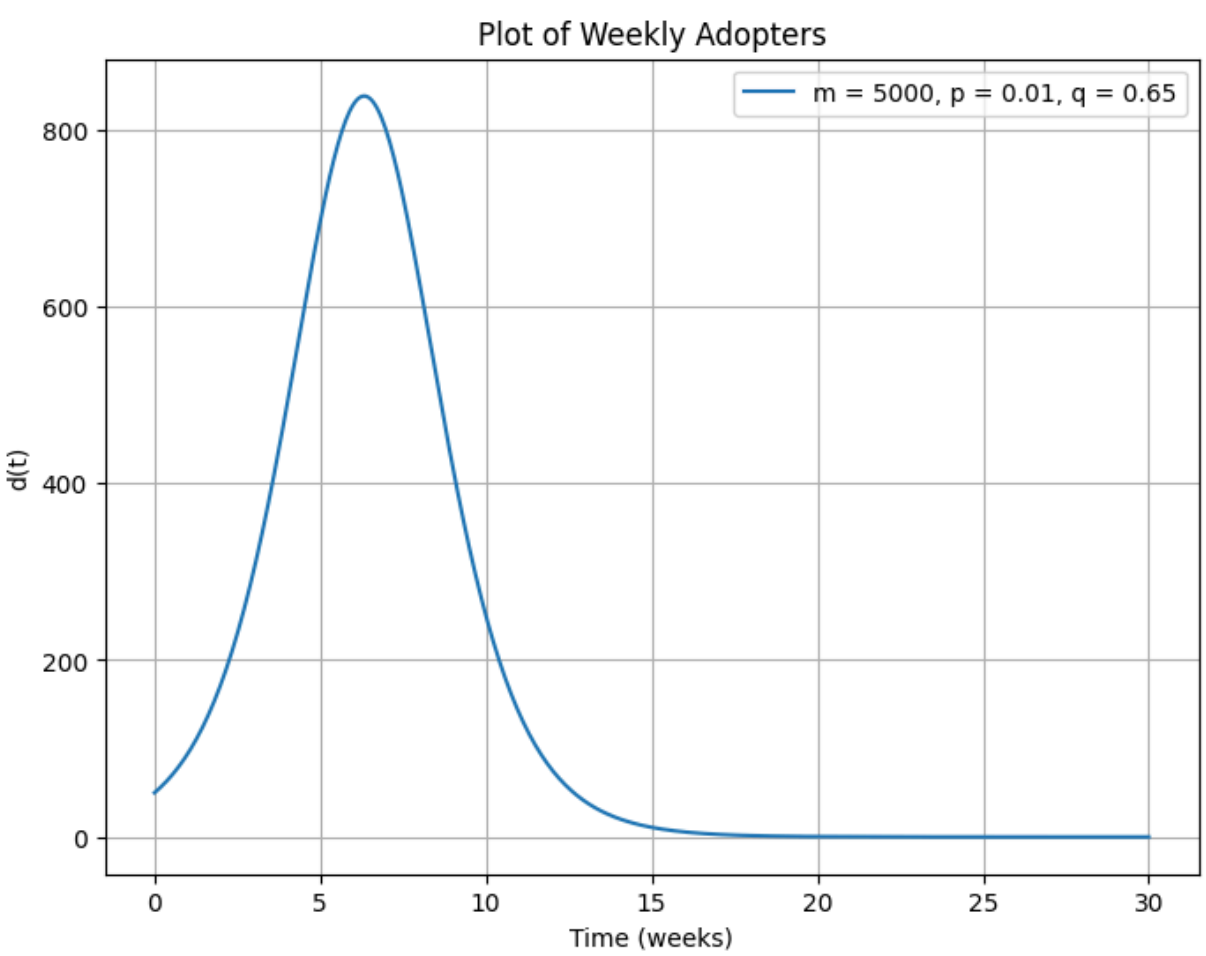
```
import matplotlib.pyplot as plt

p = 0.01; q = 0.65; m = 5000

t_values = np.linspace(0, 30, 500) #Adjust range and resolution if we need

#Compute d(t) and D(t)
d_values = []; D_values = []
for t in t_values:
  dt, Dt = BDM(p, q, m, t)
  d_values.append(dt)
  D_values.append(Dt)
```

```
#Plotting
plt.figure(figsize=(8, 6))
plt.plot(t_values, d_values, label=f'm = {m}, p = {p}, q = {q}')
plt.title('Plot of Weekly Adopters')
plt.xlabel('Time (weeks)')
plt.ylabel('d(t)')
plt.legend()
plt.grid(True)
plt.show()
```




```
#Plotting
plt.figure(figsize=(8, 6))
```

```
plt.plot(t_values, D_values, label=f'm = {m}, p = {p}, q = {q}')
plt.title('Plot of Cumulative Adopters')
plt.xlabel('Time (weeks)')
plt.ylabel('D(t)')
plt.legend()
plt.grid(True)
plt.show()
```