

Task1

The MATLAB Editor window displays the script `task1.m` with the following code:

```
1 L=2;  
2 M=8;  
3 t=0;  
4 Q=[-L L; M -M];  
5 P=expm(Q*t);
```

The Workspace pane on the left shows the following variables:

Name	Value	Size	Class
L	2	1x1	double
M	8	1x1	double
P	[1.0, 0, 1]	2x2	double
Q	[-2, 2, 8, -8]	2x2	double
t	0	1x1	double

The Command Window is empty, showing the prompt `>>`.

At T=0

The MATLAB Editor window displays the same script `task1.m` as above.

The Workspace pane on the left shows the same variables as above.

The Plot pane on the right shows a 2x2 double matrix plot. The matrix is:

	1	2
1	1	0
2	0	1
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

The Command Window is empty, showing the prompt `>>`.

At T=100

The MATLAB R2020a interface displays the following workspace variables:

Name	Value	Size	Class
L	2	1x1	double
M	8	1x1	double
P	[0.8000 0.20...	2x2	double
Q	[-2.2 8 -8]	2x2	double
t	100	1x1	double

The Command Window shows the execution of the task2 function:

```
>> task2
>>
```

The task2.m code is as follows:

```
1 L=2;
2 M=8;
3 t=100;
4 Q=[-L L; M -M];
5 P=expm(Q*t);
```

The output of the task2 function is a 2x2 double matrix:

	1	2
1	0.8000	0.2000
2	0.8000	0.2000
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		

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Task2

The MATLAB R2020a interface displays the following workspace variables:

Name	Value	Size	Class
L	5	1x1	double
M	2	1x1	double
P	5x5 double	5x5	double
Q	5x5 double	5x5	double
t	10	1x1	double

The Command Window shows the execution of the task2 and task3 functions:

```
>> task2
>> task3
>>
```

The task3.m code is as follows:

```
1 L=5;
2 M=2;
3 Q=[-5 5 0 0 0; 2 -7 5 0 0; 0 4 -9 5 0; 0 0 4 -9 5; 0 0 0 4 -9];
4 t=10;
5 P=expm(Q*t);
```

The output of the task3 function is a 5x5 double matrix:

	1	2	3	4	5
1	0.0649	0.1622	0.2027	0.2534	0.3168
2	0.0649	0.1622	0.2027	0.2534	0.3168
3	0.0649	0.1622	0.2027	0.2534	0.3168
4	0.0649	0.1622	0.2027	0.2534	0.3168
5	0.0649	0.1622	0.2027	0.2534	0.3168
6					
7					
8					
9					
10					
11					
12					
13					
14					

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Task3

The change of the probabilities according to the time when $\lambda=2$ and $\mu=8$

