```
1 C:\Users\97250\AppData\Local\Programs\Python\Python38
   \python.exe "C:/Users/97250/PycharmProjects/Graphical
   Models/main.py"
 2 Exercise 3 (2x2 lattice):
 3
       Z(temp=1) = 121.23293134406595
 4
       Z(temp=1.5) = 40.922799092745386
 5
       Z(temp=2)
                    = 27.048782764334526
 6
 7
 8 Exercise 4 (3x3 lattice):
 9
       Z(temp=1) = 365645.74913577037
10
       Z(temp=1.5) = 10565.421983514265
11
       Z(temp=2) = 2674.518123060087
12
13
14 Exercise 5 (2x2 lattice):
15
       Z(temp=1) = 121.23293134406595
       Z(temp=1.5) = 40.922799092745386
16
17
       Z(temp=2) = 27.048782764334526
18
19
20 Exercise 6: (3x3 lattice)
21
       Z(temp=1) = 365645.7491357704
22
       Z(temp=1.5) = 10565.421983514265
23
       Z(temp=2) = 2674.518123060087
24
25
26 Exercise 7: Printing images... (8x8 lattice)
27
       Printed successfully!
28
29
30 Exercise 8: Calculating empirical expectations (exact
    sampling)...
31
       E (temp=1
                  (x11, x22)
                              = 0.9508
       E_{\text{temp}}=1)(x11,x88)
32
                                 0.9038
33
       E_{\text{temp}}=1.5)(x11,x22) = 0.7566
34
       E_{\text{temp}}=1.5)(x11,x88) = 0.5446
35
       E_{\text{temp}=2} )(x11,x22) = 0.5230
       E_{\text{temp}=2} )(x11,x88)
                              = 0.1236
36
37
38
39 Exercise 9:
40
       Calculating empirical mean (Independent method
   ) . . .
```

```
File - main
                          )(x11, x22)
             E_{\text{-}}(\text{temp=1})
                                            0.9322000000000004
41
42
             E_{\text{temp}}=1
                          (x11, x88)
                                        =
                                            0.54160000000000004
             E_{\text{temp}}=1.5)(x11,x22)
43
                                            0.7484000000000007
                                        =
44
             E_{\text{temp}}=1.5)(x11,x88)
                                            0.35480000000000008
                                        =
                          )(x11, x22)
45
             E_(temp=2
                                            0.502799999999988
                                        =
46
                          )(x11,x88)
             E_{\text{temp}=2}
                                            0.1009999999999999
47
        Calculating empirical mean (Ergodicity method)...
                         )(x11,x22)
48
             E_(temp=1
                                            0.9518072289156628
             E_{\text{temp}}=1
                          )(x11,x88)
49
                                            0.9034538152610445
                                        =
             E_{\text{temp}}=1.5)(x11,x22)
50
                                            0.7722891566265037
51
             E_{\text{temp}}=1.5)(x11,x88)
                                            0.5562248995983924
                                        =
             E_{\text{temp=2}} )(x11,x22)
52
                                            0.5146184738955778
                                        =
             E_{\text{temp}=2}
                          )(x11,x88)
53
                                            0.12497991967871501
54
55
56
57 Total runtime: 6 minutes and 46 seconds.
58
59 Process finished with exit code 0
60
```