

Machine Learning for Computer Vision

Exercise 2

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1 Iterated Conditional Models

The missing code is:

```
# unary terms
energy += unaries[x0,x1,1]

# pairwise terms
energy += 4 - [labels[x0-1,x1], labels[x0+1,x1],
               labels[x0,x1-1], labels[x0,x1+1]].count(1)
```

2 Higher order factors

The domain of x_z is 0, 1, 2, 3, 4, 5, 6, 7. Each variable value represents one energy state. The pairwise factors are given in the following table:

x_z	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
x_0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
ϕ_{0z}	a	b	c	d	∞				∞				e	f	g	h
x_z	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
x_1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
ϕ_{1z}	0	0	∞	0	0	∞	∞	0	0	∞	0	0				
x_z	0	1	2	3	4	5	6	7	0	1	2	3	4	5	6	7
x_1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
ϕ_{1z}	0	∞	0	∞	0	∞	0	∞	0	∞	0	∞	0	∞	0	∞