EE379

September 11, 2017

1 EE 379K LAB 1

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```
In [307]: import numpy as np
          import pandas as pd
          import matplotlib.pyplot as plt
          %matplotlib inline
```

1.1 Question 1

```
In [308]: x = np.random.normal(-10,5,1000)

In [309]: y = np.random.normal(10,5,1000)

In [310]: sum = x+y

In [311]: plt.hist(sum,500)
```

```
Out[311]: (array([  1.,   0.,   1.,   0.,   0.,   0.,   0.,   0.,   0.,   0.,   0.,
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 <a list of 500 Patch objects>)
```

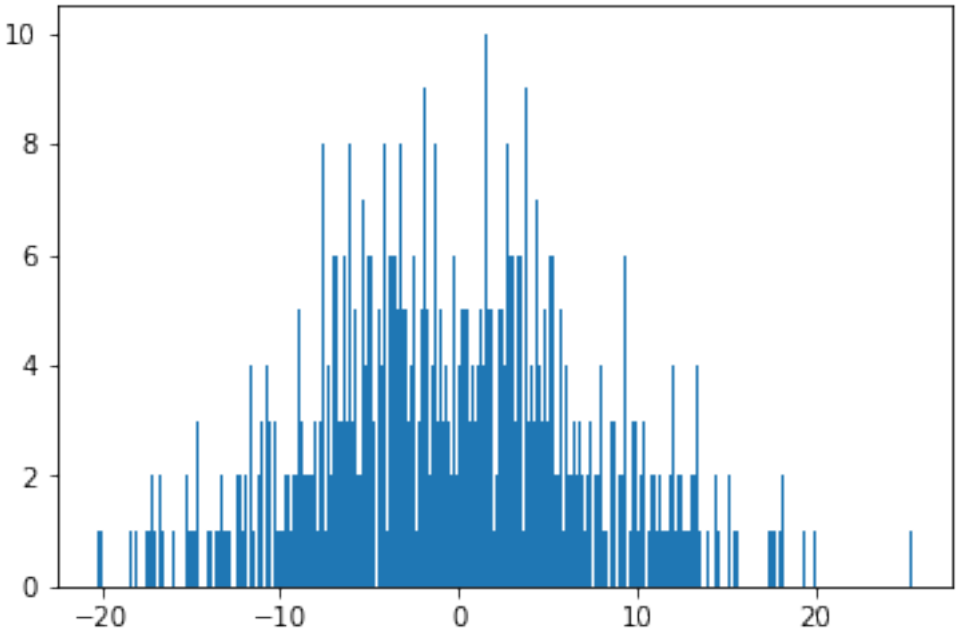


```
In [312]: np.var(sum)

Out[312]: 51.922293581198453

In [313]: np.mean(sum)

Out[313]: 0.023613291011677289

In [ ]:
```

1.2 Question 2

```
In [314]: def F(n):
              return np.sum([-1 if (x == 0) else 1 for x in np.random.binomial(1, 0.5, n)]) / n

          list = [F(5) for i in range (1000)];
          plt.hist(list)
          plt.figure()

          list = [F(50) for i in range(1000)]
          plt.hist(list, bins=10, range=[-1,1])
```

```
plt.figure()

list = [F(250) for i in range(1000)]
plt.hist(list, bins=50)
plt.figure()

list = [F(500) for i in range(1000)]
plt.hist(list, bins=100)
```

```
Out[314]: (array([  1.,   0.,   0.,   0.,   0.,   1.,   0.,   0.,   0.,   0.,   0.,
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                    6.,   1.,   0.,   4.,   2.,   0.,   0.,   1.,   0.,   2.,   0.,
                    1.]),
            array([-0.14   , -0.13728, -0.13456, -0.13184, -0.12912, -0.1264 ,
                   -0.12368, -0.12096, -0.11824, -0.11552, -0.1128 , -0.11008,
                   -0.10736, -0.10464, -0.10192, -0.0992 , -0.09648, -0.09376,
                   -0.09104, -0.08832, -0.0856 , -0.08288, -0.08016, -0.07744,
                   -0.07472, -0.072  , -0.06928, -0.06656, -0.06384, -0.06112,
                   -0.0584 , -0.05568, -0.05296, -0.05024, -0.04752, -0.0448 ,
                   -0.04208, -0.03936, -0.03664, -0.03392, -0.0312 , -0.02848,
                   -0.02576, -0.02304, -0.02032, -0.0176 , -0.01488, -0.01216,
                   -0.00944, -0.00672, -0.004  , -0.00128,  0.00144,  0.00416,
                    0.00688,  0.0096 ,  0.01232,  0.01504,  0.01776,  0.02048,
                    0.0232 ,  0.02592,  0.02864,  0.03136,  0.03408,  0.0368 ,
                    0.03952,  0.04224,  0.04496,  0.04768,  0.0504 ,  0.05312,
                    0.05584,  0.05856,  0.06128,  0.064  ,  0.06672,  0.06944,
                    0.07216,  0.07488,  0.0776 ,  0.08032,  0.08304,  0.08576,
                    0.08848,  0.0912 ,  0.09392,  0.09664,  0.09936,  0.10208,
                    0.1048 ,  0.10752,  0.11024,  0.11296,  0.11568,  0.1184 ,
                    0.12112,  0.12384,  0.12656,  0.12928,  0.132  ]),
            <a list of 100 Patch objects>)
```
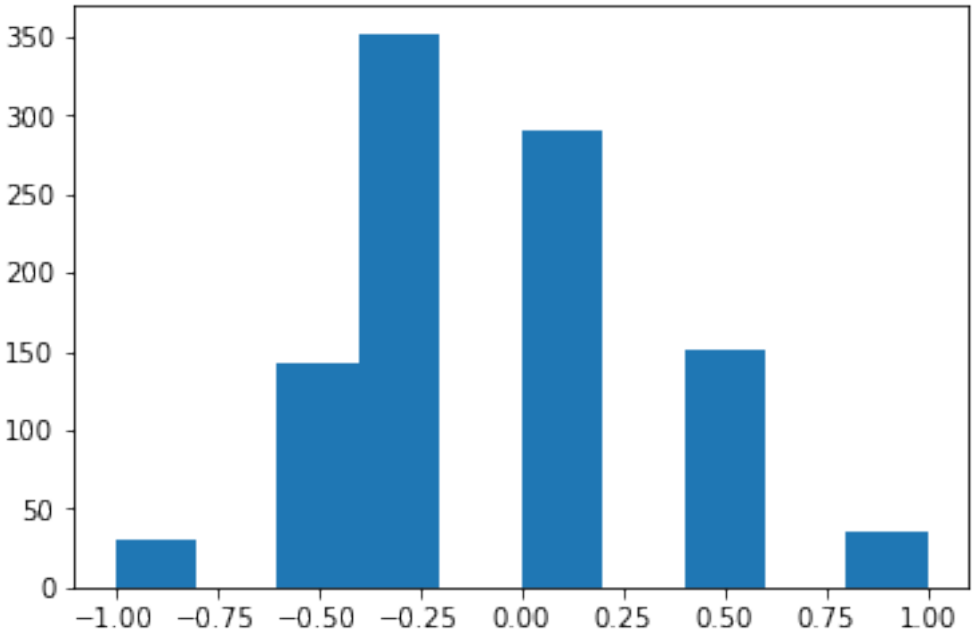
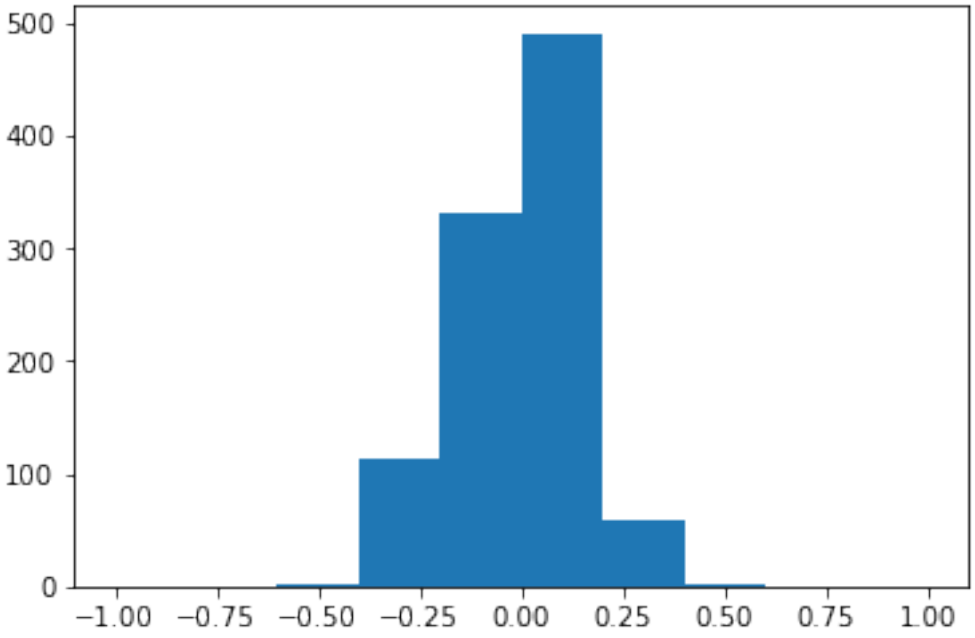
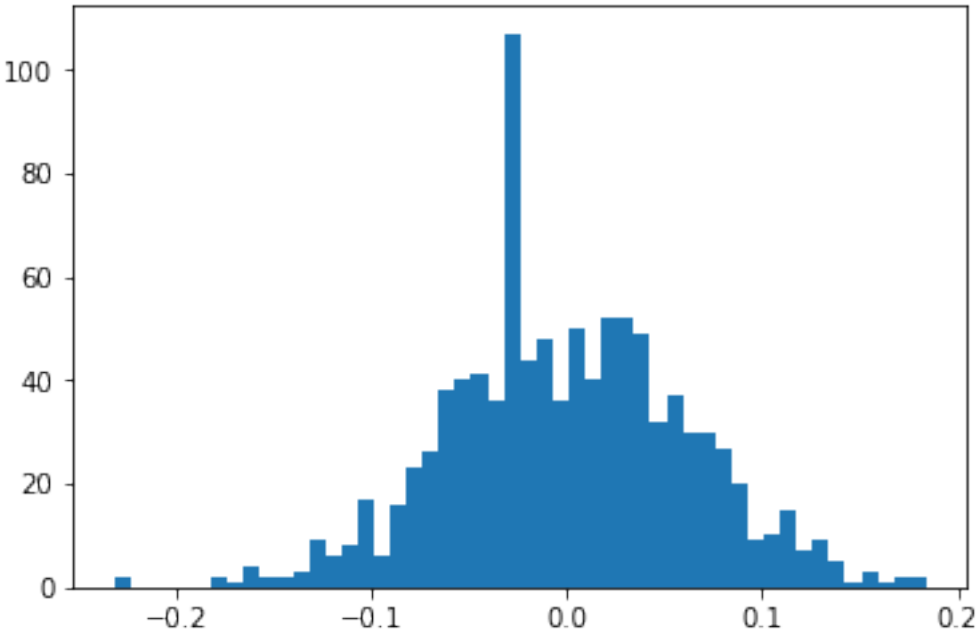
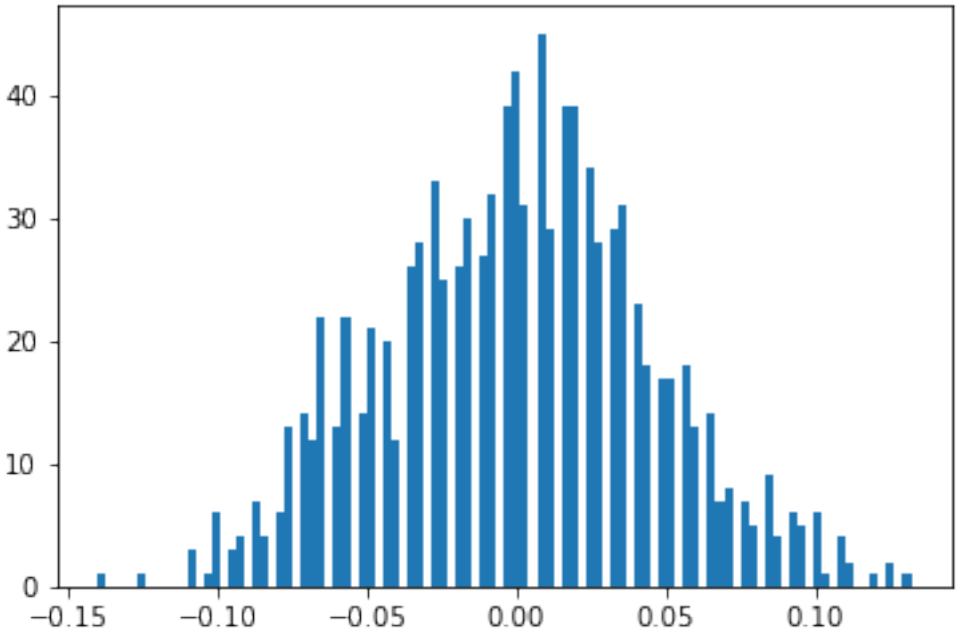


350
300
250
200
150
100
50
0
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00


500
400
300
200
100
0
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00





In [ ]:

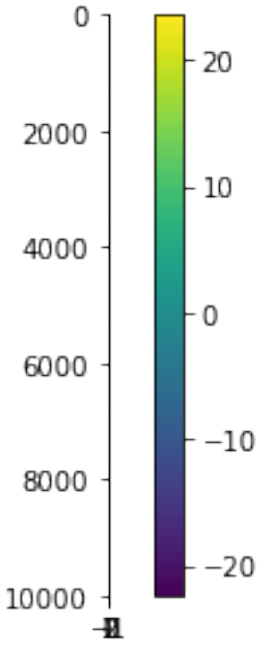
1.3 Question 3

```
In [315]: z = np.random.normal(0,5,25000)

In [316]: mean = np.sum(z)/25000

In [317]: mean

Out[317]: 0.0014462286755497144

In [318]: np.square(z - mean)

Out[318]: array([  2.89843072e-05,   1.14954910e+00,   5.47655257e+01, ...,
                   2.19550839e+00,   9.89885835e+00,   2.94308972e+01])

In [319]: sumZ = np.sum(np.square(z - mean))

In [320]: var = sumZ/(25000-1)

In [321]: stddevZ = np.sqrt(var)

In [322]: stddevZ

Out[322]: 4.9607221089277731

In [ ]:
```

1.4 Question 4

Generate data

```
In [323]: gauss2d = np.random.multivariate_normal((-5,5), np.matrix([[20, .8],[.8, 30]]), 1000

In [324]: plt.imshow(gauss2d, interpolation="nearest", origin="upper")
          plt.colorbar()
          plt.show()
```



Data generated, x values in first column, y values in second column

```
In [325]: gauss2d
```

```
Out[325]: array([[-10.76359554,  14.29345202],
                 [ -4.19325843,   9.33078281],
                 [ -0.16213733,  -0.31107979],
                 ...,
                 [  1.41583377,   8.13821567],
                 [ -4.50208525,  14.7599483 ],
                 [-10.58405567,   1.62716666]])
```

Calculate the mean for x and y

```
In [326]: mean2d = np.sum(gauss2d,axis=0)/10000
          mean_x = mean2d[0]
          mean_y = mean2d[1]
          mean_x, mean_y
```

```
Out[326]: (-4.9797652228062761, 5.0105657128232304)
```

FInd the covariance of x

```
In [327]: var_x = gauss2d[:,0]-  mean_x
```

```
In [328]: covar_x = np.sum(np.square(var_x))/10000
          covar_x
```

```
Out[328]: 19.996174582656547
```

Find the covariance of y

```
In [329]: var_y = gauss2d[:,1] - mean_y
```

```
In [330]: covar_y = np.sum(np.square(var_y))/10000
          covar_y
```

```
Out[330]: 29.629509877452218
```

Find the covariance of x and y

```
In [331]: covar_xy = np.sum(var_y*var_x)/10000
          covar_xy
```

```
Out[331]: 1.0263622538300172
```

Covariance matrix

```
In [332]: covar_matrix = [[covar_x, covar_xy], [covar_xy, covar_y]]
          covar_matrix

Out[332]: [[19.996174582656547, 1.0263622538300172],
           [1.0263622538300172, 29.629509877452218]]
```

1.5 Question 5

```
In [333]: df = pd.read_csv('PatientData.csv', header=None)
          pd.set_option('display.max_columns', None)
```

(a) 452 patients, 279 features

(b) The first four columns are most likely age, gender, height in cm, and weight in kg.

(c) The missing values '?' are replaced with NaN and then filled with the mean of the columns.

```
In [334]: df = df.replace('?', np.nan)
          df = df.apply(pd.to_numeric)

In [335]: df[10].map(type).unique()

Out[335]: array([<type 'float'>], dtype=object)

In [336]: df2 = df.fillna(df.mean())
          df2.astype(int)
```

Out[336]:

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	\
0	75	0	190	80	91	193	371	174	121	-16	13	64	-2	-13	
1	56	1	165	64	81	174	401	149	39	25	37	-17	31	-13	
2	54	0	172	95	138	163	386	185	102	96	34	70	66	23	
3	55	0	175	94	100	202	380	179	143	28	11	-5	20	-13	
4	75	0	190	80	88	181	360	177	103	-16	13	61	3	-13	
5	13	0	169	51	100	167	321	174	91	107	66	52	88	-13	
6	40	1	160	52	77	129	377	133	77	77	49	75	65	-13	
7	49	1	162	54	78	0	376	157	70	67	7	8	51	-13	
8	44	0	168	56	84	118	354	160	63	61	69	78	66	84	
9	50	1	167	67	89	130	383	156	73	85	34	70	71	-13	
10	62	0	170	72	102	135	401	156	83	72	71	68	72	-13	
11	45	1	165	86	77	143	373	150	65	12	37	49	26	-13	
12	54	1	172	58	78	155	382	163	81	-24	42	41	-13	-13	
13	30	0	170	73	91	180	355	157	104	68	51	60	63	-13	
14	44	1	160	88	77	158	399	163	94	46	20	45	40	-13	
15	47	1	150	48	75	132	350	169	65	36	45	68	40	-13	
16	47	0	171	59	82	145	347	169	61	77	75	77	75	-13	
17	46	1	158	58	70	120	353	122	52	57	49	-2	54	-13	
18	73	0	165	63	91	154	392	175	83	73	-24	61	42	-13	
19	57	1	166	72	82	181	399	158	79	-12	28	50	1	-13	

20	28	1	160	58	83	251	383	189	183	50	39	46	43	-13
21	45	0	169	67	90	122	336	177	78	81	78	67	80	-13
22	36	1	153	75	71	132	364	169	82	62	56	45	60	-13
23	57	1	165	59	75	157	406	143	92	4	10	58	5	-13
24	40	1	153	55	82	140	388	149	82	52	17	105	42	-13
25	44	0	169	80	109	128	382	195	60	-34	112	154	7	-13
26	34	0	170	73	94	186	373	224	125	90	52	60	77	-13
27	31	1	160	54	95	161	407	168	83	10	48	39	30	-13
28	56	1	164	65	90	164	420	381	99	-8	153	41	0	-13
29	51	1	160	83	96	147	400	301	82	-37	172	-5	-67	160
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	29	1	162	57	83	164	359	154	69	64	54	74	58	-13
423	51	0	186	95	94	203	367	171	106	-7	57	61	32	-13
424	7	0	119	21	140	157	438	226	81	-40	86	29	69	103
425	36	0	171	93	87	150	362	177	96	44	24	48	36	-13
426	35	1	160	53	55	163	340	162	102	40	35	69	37	-84
427	58	0	160	65	133	148	417	260	92	-158	13	63	-29	-13
428	64	0	160	63	83	0	364	120	90	29	100	60	40	-13
429	8	1	130	24	77	125	358	159	70	87	55	16	76	-13
430	11	0	138	29	123	145	361	221	80	112	-17	14	51	-44
431	47	0	166	56	79	145	381	173	101	52	47	60	49	-13
432	11	0	140	42	88	123	362	228	81	-18	52	67	33	-13
433	70	0	167	60	80	149	290	128	93	-67	111	26	-65	-13
434	20	0	178	65	88	155	360	163	71	-22	18	86	-6	-13
435	39	1	164	62	79	155	367	153	95	50	36	72	46	-13
436	32	1	164	57	77	144	340	148	82	27	55	76	41	-13
437	35	1	155	63	87	142	391	137	88	66	48	57	59	-13
438	37	0	175	82	88	146	357	179	72	1	149	51	4	-13
439	49	1	168	66	94	170	383	152	115	92	-5	65	77	-13
440	37	0	176	72	88	153	389	172	89	67	48	58	58	-90
441	37	1	160	50	74	143	374	146	75	68	14	49	55	-13
442	65	1	160	50	85	143	363	146	84	-40	-10	54	-28	-13
443	41	1	154	75	88	157	384	132	112	65	44	45	55	-13
444	29	0	166	63	81	143	325	218	74	24	27	32	25	-13
445	45	0	175	75	91	134	376	160	83	91	68	31	80	-13
446	20	1	157	57	81	151	363	166	80	43	42	72	42	-13
447	53	1	160	70	80	199	382	154	117	-37	4	40	-27	-13
448	37	0	190	85	100	137	361	201	73	86	66	52	79	-13
449	36	0	166	68	108	176	365	194	116	-85	-19	-61	-70	84
450	32	1	155	55	93	106	386	218	63	54	29	-22	43	103
451	78	1	160	70	79	127	364	138	78	28	79	52	47	-13

	14	15	16	17	18	19	20	21	22	23	24	25	26	27	\
0	63	0	52	44	0	0	32	0	0	0	0	0	0	0	
1	53	0	48	0	0	0	24	0	0	0	0	0	0	0	
2	75	0	40	80	0	0	24	0	0	0	0	0	0	20	
3	71	0	72	20	0	0	48	0	0	0	0	0	0	0	
4	74	0	48	40	0	0	28	0	0	0	0	0	0	0	

5	84	0	36	48	0	0	20	0	0	0	0	0	0	20
6	70	0	44	0	0	0	24	0	0	0	0	0	0	0
7	67	0	44	36	0	0	24	0	0	0	0	0	0	0
8	64	0	40	0	0	0	20	0	0	0	0	0	0	0
9	63	0	44	40	0	0	28	0	0	0	0	0	0	0
10	70	20	36	48	0	0	36	0	0	0	0	0	0	0
11	72	0	40	28	0	0	20	0	0	0	0	0	0	0
12	73	0	72	0	0	0	24	0	0	0	0	0	0	0
13	56	0	92	0	0	0	32	0	0	0	0	0	0	28
14	72	0	80	0	0	0	28	0	0	0	0	0	0	20
15	76	0	48	0	0	0	24	0	0	0	0	0	0	0
16	67	0	48	0	0	0	20	0	0	0	0	0	0	0
17	70	0	48	0	0	0	24	0	0	0	0	0	0	0
18	66	0	44	56	0	0	20	0	0	0	0	0	0	0
19	66	0	56	16	0	0	28	0	0	0	0	0	0	0
20	76	16	36	28	0	0	32	0	0	0	0	0	0	0
21	66	0	36	24	0	0	20	0	0	0	0	0	0	0
22	77	0	44	12	0	0	24	0	0	0	0	0	0	0
23	69	0	72	0	0	0	24	0	0	0	0	0	0	0
24	68	0	80	0	0	0	40	0	0	0	0	0	0	0
25	63	20	80	0	0	0	44	0	0	0	0	0	0	0
26	83	0	44	36	0	0	20	0	0	0	0	0	0	16
27	67	0	52	36	0	0	28	0	0	0	0	0	0	0
28	79	0	72	0	0	0	32	0	0	0	0	0	0	0
29	71	0	60	0	0	0	40	0	0	0	0	0	0	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	71	0	60	16	16	0	36	0	0	0	0	0	0	0
423	71	0	80	0	0	0	28	0	0	0	0	0	0	0
424	70	0	124	0	0	0	84	0	0	0	0	0	0	0
425	80	0	68	0	0	0	28	0	0	0	0	0	0	0
426	81	0	64	0	0	0	28	0	0	0	0	0	0	0
427	70	0	36	68	0	0	16	0	0	0	0	0	0	0
428	65	0	60	0	0	0	24	0	0	0	0	0	0	0
429	80	0	36	48	0	0	24	0	0	0	0	0	0	0
430	93	0	36	68	0	0	20	0	0	0	0	0	0	28
431	49	0	44	28	0	0	24	0	0	0	0	0	0	0
432	74	0	40	16	0	0	20	0	0	0	0	0	0	0
433	120	0	52	0	0	0	24	0	0	0	0	0	0	0
434	71	16	80	0	0	0	36	0	0	1	0	0	0	0
435	81	0	52	16	0	0	32	0	0	0	0	0	0	0
436	81	24	44	0	0	0	44	0	0	0	0	0	0	24
437	62	0	44	44	0	0	24	0	0	0	0	0	0	20
438	62	16	64	0	0	0	40	0	0	0	0	0	0	0
439	72	0	36	60	0	0	20	0	0	0	0	0	0	0
440	55	0	40	32	0	0	20	0	0	0	0	0	0	0
441	65	0	48	20	0	0	24	0	0	0	0	0	0	0
442	68	20	36	36	0	0	36	0	0	0	0	0	0	0
443	62	0	40	40	0	0	20	0	0	0	0	0	0	0

444	78	0	48	16	0	0	28	0	0	0	0	0	0	0
445	70	0	32	32	0	0	20	0	0	0	0	0	0	0
446	75	0	48	0	0	0	28	0	0	0	0	0	0	0
447	63	0	52	24	0	0	28	0	0	0	0	0	0	0
448	73	0	44	36	0	0	24	0	0	0	0	0	0	0
449	84	16	40	40	0	0	40	0	0	0	0	0	0	0
450	80	0	56	0	0	0	32	0	0	0	0	0	0	16
451	75	0	44	28	0	0	24	0	0	0	0	0	0	0

	28	29	30	31	32	33	34	35	36	37	38	39	40	41	\
0	44	20	36	0	28	0	0	0	0	0	0	52	40	0	
1	64	0	0	0	24	0	0	0	0	0	0	32	24	0	
2	56	52	0	0	40	0	0	0	0	0	0	28	116	0	
3	64	36	0	0	36	0	0	0	0	0	0	20	52	48	
4	40	24	0	0	24	0	0	0	0	0	0	52	36	0	
5	44	36	0	0	44	0	0	0	0	0	0	24	64	0	
6	40	32	0	0	24	0	0	0	0	0	0	0	44	28	
7	52	32	0	0	28	0	0	0	0	0	0	0	56	28	
8	44	12	0	0	28	0	0	0	0	0	0	0	36	8	
9	56	24	0	0	32	0	0	0	0	0	0	0	72	0	
10	52	0	0	0	28	0	0	0	0	0	0	0	104	0	
11	40	20	0	0	20	0	0	0	0	0	0	32	44	0	
12	44	44	0	0	28	0	0	0	0	0	0	80	0	0	
13	48	20	0	0	52	0	0	0	0	0	0	36	40	0	
14	72	0	0	0	44	0	0	0	0	0	0	24	64	0	
15	44	28	0	0	28	0	0	0	0	0	0	0	40	40	
16	52	36	0	0	28	0	0	0	0	0	0	0	52	36	
17	48	0	0	0	28	0	0	0	0	0	0	0	44	12	
18	84	0	0	0	28	0	0	0	0	0	0	16	72	0	
19	64	32	0	0	44	0	0	0	0	0	0	0	20	72	
20	44	28	0	0	24	0	0	0	0	0	0	0	52	28	
21	52	36	0	0	28	0	0	0	0	0	0	0	60	32	
22	72	0	0	0	24	0	0	0	0	0	0	16	56	0	
23	48	36	0	0	28	0	0	0	0	0	0	0	28	52	
24	52	28	0	0	32	0	0	0	0	0	0	20	40	32	
25	52	68	0	0	36	0	0	0	0	0	0	0	28	76	
26	48	20	0	0	40	0	0	0	0	0	0	24	72	0	
27	48	52	0	0	28	0	0	0	0	0	0	0	44	68	
28	60	36	0	0	40	0	0	0	0	0	0	0	16	64	
29	40	56	0	0	24	0	0	0	0	0	0	84	0	0	
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
422	52	40	0	0	32	0	0	0	0	0	0	0	48	40	
423	40	28	0	0	24	0	0	0	0	0	0	48	0	0	
424	64	52	0	0	44	0	0	0	0	0	0	0	52	60	
425	68	0	0	0	28	0	0	0	0	0	0	0	56	0	
426	44	0	0	0	24	0	0	0	0	0	0	0	28	0	
427	40	76	0	0	20	0	0	0	0	0	0	0	32	16	
428	80	0	0	0	28	0	0	0	0	0	0	0	36	32	

429	60	0	0	0	24	0	0	0	0	0	0	0	60	0
430	32	68	0	0	40	0	0	0	0	0	0	32	52	0
431	56	0	0	0	28	0	0	0	0	0	0	0	72	0
432	40	36	0	0	24	0	0	0	0	0	0	0	32	52
433	28	48	0	0	16	0	0	0	0	0	0	0	20	52
434	40	32	0	0	24	0	0	0	0	0	0	0	28	68
435	60	0	0	0	24	0	0	0	0	0	0	24	52	0
436	40	24	0	0	44	0	0	0	0	0	0	16	20	24
437	68	0	0	0	40	0	0	0	0	0	0	20	64	0
438	44	48	0	0	28	0	0	0	0	0	0	0	40	60
439	92	0	0	0	32	0	0	0	0	0	0	0	80	0
440	56	32	0	0	36	0	0	0	0	0	0	0	60	32
441	60	16	0	0	36	0	0	0	0	0	0	0	72	0
442	44	52	0	0	32	0	0	0	0	0	0	0	32	48
443	48	40	0	0	28	0	0	0	0	0	0	0	48	40
444	40	20	0	0	20	0	0	0	0	0	0	20	16	28
445	40	20	0	0	20	0	0	0	0	0	0	0	72	0
446	56	24	0	0	36	0	0	0	0	0	0	0	56	36
447	44	40	0	0	32	0	0	0	0	0	0	0	24	48
448	56	0	0	0	32	0	0	0	0	0	0	0	76	0
449	40	56	0	0	32	0	0	0	0	0	0	0	28	60
450	64	0	0	0	40	0	0	0	0	0	0	16	60	0
451	56	0	0	0	36	0	0	0	0	0	0	0	20	36

	42	43	44	45	46	47	48	49	50	51	52	53	54	55	\
0	0	0	60	0	0	0	0	0	0	52	0	0	0	0	
1	0	0	40	0	0	0	0	0	0	48	0	0	0	0	
2	0	0	52	0	0	0	0	0	0	52	64	0	0	0	
3	0	0	56	0	0	0	0	0	0	64	32	0	0	0	
4	0	0	60	0	0	0	0	0	0	48	28	0	0	0	
5	0	0	48	0	0	0	0	0	0	44	36	0	0	0	
6	0	0	24	0	0	0	0	0	0	44	16	0	0	0	
7	0	0	24	0	0	0	0	0	0	48	32	0	0	0	
8	0	0	20	0	0	0	0	0	0	40	12	0	0	0	
9	0	0	28	0	0	0	0	0	0	56	28	0	0	0	
10	0	0	36	0	0	0	0	0	0	40	36	0	0	0	
11	0	0	36	0	0	0	0	0	0	40	28	0	0	0	
12	0	0	0	0	0	0	0	0	0	44	36	0	0	0	
13	0	0	52	0	0	0	0	0	0	56	0	0	0	0	
14	0	0	52	0	0	0	1	0	0	80	0	0	0	0	
15	0	0	24	0	0	0	0	0	0	40	32	0	0	0	
16	0	0	28	0	0	0	0	0	0	52	32	0	0	0	
17	0	0	24	0	0	0	0	0	0	48	16	0	0	0	
18	0	0	44	0	0	0	0	0	0	76	0	0	0	0	
19	0	0	8	0	0	0	0	0	0	68	20	0	0	0	
20	0	0	32	0	0	0	0	0	0	48	24	0	0	0	
21	0	0	40	0	0	0	0	0	0	52	24	0	0	0	
22	0	0	32	0	0	0	0	0	0	72	0	0	0	0	

23	0	0	12	0	0	0	0	0	0	76	0	0	0	0
24	0	0	44	0	0	0	0	0	0	64	0	0	0	0
25	0	0	16	0	0	0	0	0	0	76	0	0	0	0
26	0	0	40	0	0	0	0	0	0	0	12	48	32	0
27	0	0	32	0	0	0	0	0	0	48	48	0	0	0
28	0	0	8	0	0	0	0	0	0	72	0	0	0	0
29	0	0	0	0	0	0	0	0	0	48	48	0	0	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	0	0	28	0	0	0	0	0	0	56	24	0	0	0
423	0	0	0	0	0	0	0	0	0	44	20	0	0	0
424	0	0	40	0	0	0	0	0	0	76	36	0	0	0
425	0	0	16	0	0	0	0	0	0	64	0	0	0	0
426	0	0	16	0	0	0	0	0	0	48	0	0	0	0
427	12	24	16	0	0	0	0	0	0	0	16	32	84	0
428	0	0	12	0	0	0	0	0	0	72	0	0	0	0
429	0	0	40	0	0	0	0	0	0	44	40	0	0	0
430	0	0	44	0	0	0	0	0	0	0	16	36	60	0
431	0	0	28	0	1	0	0	0	0	52	28	0	0	0
432	0	0	20	0	0	0	0	0	0	40	32	0	0	0
433	0	0	12	0	0	0	0	0	0	28	52	0	0	0
434	0	0	12	0	0	0	0	0	0	40	20	0	0	0
435	0	0	48	0	0	0	0	0	0	72	0	0	0	0
436	0	0	24	0	0	0	0	0	0	0	20	44	0	0
437	0	0	40	0	0	0	0	0	0	88	0	0	0	0
438	0	0	16	0	0	0	0	0	0	48	36	0	0	0
439	0	0	24	0	0	0	0	0	0	60	0	0	0	0
440	0	0	40	1	0	0	0	0	0	48	20	0	0	0
441	0	0	36	0	0	0	0	0	0	52	20	0	0	0
442	0	0	20	0	0	0	0	0	0	40	44	0	0	0
443	0	0	28	0	0	0	0	0	0	48	28	0	0	0
444	0	0	24	0	0	0	0	0	0	40	20	0	0	0
445	0	0	20	0	1	0	0	0	0	32	24	0	0	0
446	0	0	40	0	0	0	0	0	0	52	24	0	0	0
447	0	0	12	0	0	0	0	0	0	40	36	0	0	0
448	0	0	28	0	0	0	0	0	0	48	28	0	0	0
449	0	0	12	0	0	0	0	0	0	36	48	0	0	0
450	0	0	32	0	1	0	0	0	0	72	0	0	0	0
451	28	0	60	0	0	0	0	0	0	48	28	0	0	0

	56	57	58	59	60	61	62	63	64	65	66	67	68	69	\
0	0	0	0	0	0	0	0	0	56	36	0	0	32	0	
1	0	0	0	0	0	0	0	0	44	20	0	0	24	0	
2	88	0	0	0	0	0	0	0	36	92	0	0	24	0	
3	72	0	0	0	0	0	0	0	60	12	0	0	44	0	
4	56	0	0	0	0	0	0	0	48	36	0	0	28	0	
5	52	0	0	0	0	0	0	0	28	64	0	0	16	0	
6	48	0	0	0	0	0	0	36	0	0	0	0	0	0	
7	56	0	0	0	0	0	0	52	0	0	0	0	0	0	

8	44	0	0	0	0	0	0	0	0	0	0	0	0	0
9	60	0	0	0	0	0	0	0	28	56	0	0	16	0
10	48	0	0	0	0	0	0	28	24	40	0	0	40	0
11	48	0	0	0	0	0	0	0	40	28	0	0	20	0
12	48	0	0	0	0	0	0	0	84	0	0	0	28	0
13	0	0	0	0	0	0	0	0	40	36	0	0	28	0
14	0	0	0	0	0	0	0	0	36	36	0	0	20	0
15	44	0	0	0	0	0	0	0	60	0	0	0	20	0
16	56	0	0	0	0	0	0	48	32	0	0	0	60	0
17	52	0	0	0	0	0	0	0	24	0	0	0	8	0
18	0	0	0	0	0	0	0	0	36	40	0	0	12	0
19	72	1	0	0	0	0	0	0	56	0	0	0	32	0
20	52	0	0	0	0	0	0	12	76	0	0	0	24	0
21	56	0	0	0	0	0	0	44	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	28	32	0	0	16	0
23	0	0	0	0	0	0	0	20	56	0	0	0	36	0
24	0	0	0	0	0	0	0	28	28	0	0	0	36	0
25	0	0	0	0	0	0	0	24	76	0	0	0	56	0
26	68	0	0	0	0	0	0	0	24	68	0	0	12	0
27	52	0	0	0	0	0	0	0	100	0	0	0	36	0
28	0	0	0	0	0	0	0	0	68	0	0	0	24	0
29	56	0	0	0	0	0	0	0	64	0	0	0	40	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	60	0	0	0	0	0	0	32	40	0	0	0	40	0
423	48	0	0	0	0	0	0	0	76	0	0	0	32	0
424	92	0	0	0	0	0	0	20	64	0	0	0	56	0
425	0	0	0	0	0	0	0	0	44	0	0	0	24	0
426	0	0	0	0	0	0	0	0	64	0	0	0	36	0
427	72	0	0	0	0	0	0	0	32	92	0	0	16	0
428	0	0	0	0	0	0	0	16	56	0	0	0	40	0
429	52	0	0	0	0	0	0	0	32	48	0	0	24	0
430	60	0	0	0	0	0	0	0	32	64	0	0	24	0
431	56	0	0	0	0	0	0	0	36	28	0	0	20	0
432	48	0	0	0	0	0	0	0	80	0	0	0	20	0
433	40	0	0	0	0	0	0	16	52	0	0	0	36	0
434	44	0	0	0	0	0	0	16	80	0	0	0	52	0
435	0	0	0	0	0	0	0	0	48	24	0	0	36	0
436	8	0	0	0	0	0	0	0	56	0	0	0	32	0
437	0	0	0	0	0	0	0	0	40	44	0	0	20	0
438	52	0	0	0	0	0	0	20	76	0	0	0	44	0
439	0	0	0	0	0	0	0	0	24	68	0	0	12	0
440	52	0	0	0	0	0	0	24	0	0	0	0	0	0
441	60	0	0	0	0	0	0	0	16	0	0	0	8	0
442	48	0	0	0	0	0	0	24	48	0	0	0	40	0
443	56	0	0	0	0	0	0	0	0	0	0	0	0	0
444	44	0	0	0	0	0	0	0	52	0	0	0	28	0
445	40	0	0	0	0	0	0	52	0	0	0	0	0	0
446	56	0	0	0	0	0	0	20	40	0	0	0	36	0

447	48	0	0	0	0	0	0	0	52	0	0	0	28	0
448	56	0	0	0	0	0	0	64	0	0	0	0	0	0
449	52	0	0	0	0	0	0	24	52	40	0	0	48	0
450	0	0	0	0	0	0	0	0	64	0	0	0	12	0
451	52	0	0	0	0	0	0	20	36	28	0	0	36	0

	70	71	72	73	74	75	76	77	78	79	80	81	82	83	\
0	0	0	0	0	0	48	32	0	0	0	56	0	0	0	
1	0	0	0	0	0	0	60	0	0	0	20	0	0	0	
2	0	0	0	0	0	0	128	0	0	0	24	0	1	0	
3	0	0	0	0	0	0	60	44	0	0	32	0	0	0	
4	0	0	0	0	0	44	0	0	0	0	0	0	0	0	
5	0	0	0	0	0	24	44	40	0	0	44	0	0	0	
6	0	0	0	0	0	0	44	16	0	0	24	0	0	0	
7	0	0	0	0	0	0	52	28	0	0	28	0	0	0	
8	0	0	0	0	0	0	36	12	0	0	20	0	0	0	
9	0	0	0	0	0	0	60	0	0	0	32	0	0	0	
10	0	0	0	0	0	0	84	0	0	0	28	0	0	0	
11	0	0	0	0	0	12	24	16	0	0	20	0	0	0	
12	0	0	0	0	0	72	0	0	0	0	0	0	0	0	
13	0	0	0	0	0	32	44	0	0	0	52	0	0	0	
14	0	0	0	0	0	0	80	0	0	0	32	0	0	0	
15	0	0	0	0	0	0	40	36	0	0	24	0	0	0	
16	0	0	0	0	0	0	52	32	0	0	28	0	0	0	
17	0	0	0	0	0	0	48	0	0	0	28	0	0	0	
18	0	0	0	0	0	0	68	0	0	0	32	0	0	0	
19	0	0	0	0	0	0	24	64	0	0	8	0	0	0	
20	1	0	0	0	0	0	48	24	0	0	28	0	0	0	
21	0	0	0	0	0	0	56	28	0	0	32	0	0	0	
22	0	0	0	0	0	0	72	0	0	0	32	0	0	0	
23	0	0	0	0	0	0	40	40	0	0	24	0	0	0	
24	0	0	0	0	0	0	52	24	0	0	32	0	0	0	
25	0	0	0	0	0	0	44	60	0	0	20	0	0	0	
26	0	0	0	0	0	20	48	0	0	0	40	0	0	0	
27	0	0	0	0	0	0	36	60	0	0	20	0	0	0	
28	0	0	0	0	0	0	24	60	0	0	12	0	0	0	
29	0	0	0	0	0	88	0	0	0	0	0	1	0	0	
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
422	0	0	0	0	0	0	52	36	0	0	32	0	0	0	
423	0	0	0	0	0	0	32	44	0	0	20	0	0	0	
424	0	0	0	0	0	0	64	56	0	0	48	0	0	0	
425	0	0	0	0	0	0	64	0	0	0	24	0	0	0	
426	0	0	0	0	0	0	40	0	0	0	24	0	0	0	
427	0	0	0	0	0	28	28	80	0	0	40	0	0	0	
428	0	0	0	0	0	0	48	16	20	0	28	0	0	0	
429	0	0	0	0	0	0	64	8	0	0	24	0	0	0	
430	0	0	0	0	0	28	32	64	0	0	40	0	0	0	
431	0	0	0	0	0	0	68	0	0	0	32	0	0	0	

432	0	0	0	0	0	0	36	44	0	0	24	0	0	0
433	0	0	0	0	0	0	24	48	0	0	12	0	0	0
434	0	0	0	0	0	0	40	52	0	0	28	0	0	0
435	0	0	0	0	0	16	56	0	0	0	40	0	0	0
436	0	0	0	0	0	12	36	16	0	0	32	0	0	0
437	0	0	0	0	0	0	76	0	0	0	20	0	0	0
438	0	0	0	0	0	0	44	48	0	0	28	0	0	0
439	0	0	0	0	0	0	92	0	0	0	32	0	0	0
440	0	0	0	0	0	0	56	0	0	0	36	0	0	0
441	0	0	0	0	0	0	56	0	0	0	32	0	0	0
442	0	0	0	0	0	0	36	48	0	0	20	0	0	0
443	0	0	0	0	0	0	48	40	0	0	28	0	0	0
444	0	0	0	0	0	0	32	20	0	0	16	0	0	0
445	0	0	0	0	0	0	40	0	0	0	20	0	0	0
446	0	0	0	0	0	0	56	20	0	0	36	0	0	0
447	0	0	0	0	0	0	24	56	0	0	8	0	0	0
448	0	0	0	0	0	0	76	0	0	0	32	0	0	0
449	0	0	0	0	0	0	32	60	0	0	16	0	0	0
450	0	0	0	0	0	12	64	0	0	0	36	0	0	0
451	0	0	0	0	0	0	84	0	0	0	36	0	0	0

	84	85	86	87	88	89	90	91	92	93	94	95	96	97	\
0	0	0	0	80	0	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	24	52	0	0	16	0	0	0	0	0	
2	0	0	0	0	24	36	76	0	100	0	0	0	0	0	
3	0	0	0	56	0	0	0	0	0	0	0	0	0	0	
4	0	0	0	88	0	0	0	0	0	0	0	0	0	0	
5	0	0	0	0	36	60	0	0	24	0	0	0	0	0	
6	0	0	0	0	20	56	0	0	12	0	0	0	0	0	
7	0	0	0	0	20	44	0	0	8	0	0	0	0	0	
8	0	0	0	0	20	56	0	0	12	0	0	0	0	0	
9	0	0	0	0	24	36	32	0	68	0	0	0	0	0	
10	0	0	0	0	24	64	0	0	12	0	0	0	0	0	
11	0	0	0	0	20	44	0	0	12	0	0	0	0	0	
12	0	0	0	0	24	36	28	0	72	0	0	0	0	0	
13	0	0	0	0	44	44	0	0	28	0	0	0	0	0	
14	0	0	0	0	28	48	0	0	20	0	0	1	0	0	
15	0	0	0	0	20	44	0	0	12	0	0	0	0	0	
16	0	0	0	0	16	48	20	0	72	0	0	0	0	0	
17	0	0	0	60	0	0	0	0	0	0	0	0	0	0	
18	0	0	0	72	0	0	0	0	0	0	0	0	0	0	
19	0	0	0	60	20	0	0	0	64	0	0	0	0	0	
20	0	0	0	0	24	68	0	0	16	0	0	0	0	0	
21	0	0	0	0	32	44	0	0	20	0	0	0	0	0	
22	0	0	0	0	32	40	0	0	20	0	0	0	0	0	
23	0	0	0	0	28	60	0	0	16	0	0	0	0	0	
24	0	0	0	0	24	48	0	0	12	0	0	0	0	0	
25	0	0	0	76	0	0	0	0	0	0	0	0	0	0	

26	0	0	0	0	28	48	32	0	12	0	0	0	0	0
27	0	0	0	0	24	40	32	0	72	0	0	0	0	0
28	0	0	0	76	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	20	52	0	0	8	0	0	0	0	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	0	0	0	0	24	52	0	0	16	0	0	0	0	0
423	0	0	0	76	0	0	0	0	0	0	0	0	0	0
424	0	0	0	0	20	92	0	0	12	0	0	0	0	0
425	0	0	0	0	32	56	0	0	20	0	0	0	0	0
426	0	0	0	0	24	44	0	0	12	0	0	0	0	0
427	0	0	0	0	28	36	80	0	96	0	0	0	0	0
428	0	0	0	0	20	64	0	0	12	0	0	0	0	0
429	0	0	0	0	20	20	52	0	52	0	0	0	0	0
430	0	0	0	0	32	24	56	0	88	0	0	0	1	0
431	0	0	0	0	28	52	0	0	20	0	0	0	0	0
432	0	0	0	0	20	32	0	0	8	0	0	0	0	0
433	0	0	0	52	0	0	0	0	0	0	0	0	0	0
434	0	0	0	0	28	60	0	0	20	0	0	0	0	0
435	0	0	0	0	24	52	0	0	8	0	0	0	0	0
436	0	0	0	0	28	48	0	0	20	0	0	0	0	0
437	0	0	0	0	20	60	0	0	8	0	0	0	0	0
438	0	0	0	0	28	40	0	0	16	0	0	0	0	0
439	0	0	0	0	24	44	0	0	12	0	0	0	0	0
440	0	0	0	0	28	60	0	0	16	0	0	0	0	0
441	0	0	0	0	32	56	0	0	20	0	0	0	0	0
442	0	0	0	0	24	48	0	0	12	0	0	0	0	0
443	0	0	0	0	36	20	44	0	68	0	0	0	0	0
444	0	0	0	0	20	52	0	0	12	0	0	0	0	0
445	0	0	0	0	32	60	0	0	20	0	0	0	0	0
446	0	0	0	0	20	60	0	0	12	0	0	0	0	0
447	0	0	0	60	0	0	0	0	0	0	0	0	0	0
448	0	0	0	44	36	0	0	0	52	0	0	0	0	0
449	0	0	0	0	20	16	44	28	56	0	0	0	0	0
450	0	0	0	0	28	52	0	0	16	0	0	0	0	0
451	0	0	0	0	28	40	0	0	16	0	0	0	0	0

	98	99	100	101	102	103	104	105	106	107	108	109	110	111	\
0	0	0	40	52	0	0	28	0	0	0	0	0	0	0	
1	0	0	32	52	0	0	20	0	0	0	0	0	0	0	
2	0	0	40	28	60	0	96	0	0	0	0	0	0	0	
3	0	0	40	44	0	0	20	0	0	0	0	0	0	0	
4	0	0	40	52	0	0	28	0	0	0	0	0	0	0	
5	0	20	32	60	0	0	40	0	0	0	0	0	0	24	
6	0	0	24	56	0	0	16	0	0	0	0	0	0	0	
7	0	0	24	48	0	0	16	0	0	0	0	0	0	0	
8	0	0	24	48	0	0	12	0	0	0	0	0	0	0	
9	0	0	36	44	0	0	20	0	0	0	0	0	0	0	
10	0	20	16	56	0	0	28	0	0	0	0	0	0	24	

11	0	0	36	48	0	0	24	0	0	0	0	0	0	0
12	0	0	36	32	0	0	24	0	0	0	0	0	0	0
13	0	0	48	24	0	0	32	0	0	0	0	0	0	0
14	0	0	36	36	0	0	20	0	0	0	0	0	0	0
15	0	0	28	44	0	0	20	0	0	0	0	0	0	0
16	0	0	20	48	20	0	76	0	0	0	0	0	0	0
17	1	60	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	24	64	0	0	16	0	0	0	0	0	0	0
19	0	0	44	24	0	0	20	0	0	0	0	0	0	0
20	0	0	36	48	0	0	24	0	0	0	0	0	0	0
21	0	0	40	36	24	0	24	0	0	0	0	0	0	0
22	0	0	40	28	0	0	24	0	0	0	0	0	0	0
23	0	0	32	44	0	0	20	0	0	0	0	0	0	0
24	0	0	28	44	0	0	16	0	0	0	0	0	0	0
25	0	0	20	64	0	0	12	0	0	0	0	0	0	0
26	0	0	32	48	0	0	20	0	0	1	1	0	0	0
27	0	0	36	44	0	0	24	0	0	0	0	0	0	0
28	0	72	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	36	48	0	0	20	0	0	0	0	0	0	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	0	0	32	52	0	0	20	0	0	0	0	0	0	0
423	0	0	36	52	0	0	24	0	0	0	0	0	0	0
424	0	0	28	80	0	0	16	0	0	0	0	0	0	0
425	0	0	36	44	0	0	24	0	0	0	0	0	0	0
426	0	0	24	48	0	0	16	0	0	0	0	0	0	0
427	0	0	40	60	0	0	24	0	0	0	0	0	0	0
428	0	0	24	64	0	0	12	0	0	0	0	0	0	0
429	0	0	40	40	0	0	24	0	0	0	0	0	0	0
430	0	0	32	28	72	0	20	0	0	1	0	0	0	0
431	0	0	32	52	0	0	20	0	0	0	0	0	0	0
432	0	0	24	20	48	0	56	0	0	0	0	0	0	0
433	0	44	0	0	0	0	0	0	0	0	0	0	0	60
434	0	0	44	48	0	0	36	0	0	0	0	0	0	0
435	0	0	44	32	0	0	32	0	0	0	0	0	0	0
436	0	0	36	40	0	0	24	0	0	0	0	0	0	0
437	0	0	24	60	0	0	16	0	0	0	0	0	0	0
438	0	0	36	40	0	0	20	0	0	0	0	0	0	0
439	0	0	44	64	0	0	32	0	0	0	0	0	0	0
440	0	0	32	48	0	0	20	0	0	0	0	0	0	0
441	0	0	36	44	0	0	24	0	0	0	0	0	0	0
442	0	0	40	20	0	0	24	0	0	0	0	0	0	0
443	0	0	44	32	28	0	28	0	0	0	0	0	0	0
444	0	0	28	44	0	0	20	0	0	0	0	0	0	0
445	0	0	28	64	0	0	16	0	0	0	0	0	0	0
446	0	0	44	48	0	0	28	0	0	0	0	0	0	0
447	0	0	16	56	0	0	8	0	0	0	0	0	0	0
448	0	0	32	44	0	0	20	0	0	0	0	0	0	0
449	0	0	84	28	0	0	60	0	0	0	0	0	0	0

450	0	0	36	44	0	0	20	0	0	0	0	0	0	0	
451	0	0	44	40	0	0	24	0	0	0	0	0	0	0	

	112	113	114	115	116	117	118	119	120	121	122	123	124	125	\
0	48	48	0	0	32	0	0	0	0	0	0	0	52	52	
1	44	48	0	0	32	0	0	0	0	0	0	0	48	44	
2	48	20	56	24	32	0	0	0	0	0	0	0	44	88	
3	52	40	0	0	32	0	0	0	0	0	0	0	56	48	
4	48	48	0	0	32	0	0	0	0	0	0	0	48	52	
5	32	60	0	0	44	0	0	0	0	0	0	0	52	40	
6	36	48	0	0	24	0	0	0	0	0	0	0	40	44	
7	36	44	0	0	24	0	0	0	0	0	0	0	44	48	
8	28	44	0	0	16	0	0	0	0	0	0	0	44	32	
9	40	48	0	0	24	0	0	0	0	0	0	0	56	40	
10	28	52	0	0	40	0	0	0	0	0	0	24	32	56	
11	40	48	0	0	24	0	0	0	0	0	0	0	36	56	
12	44	44	0	0	28	0	0	0	0	0	0	0	48	52	
13	52	36	0	0	36	0	0	0	0	0	0	0	60	12	
14	52	20	0	0	32	0	0	0	0	0	0	0	48	12	
15	48	20	0	0	20	0	0	0	0	0	0	0	48	24	
16	24	52	0	0	12	0	0	0	0	0	0	0	56	28	
17	32	44	0	0	16	0	0	0	0	0	0	0	48	40	
18	40	52	0	0	28	0	0	0	0	0	0	0	44	52	
19	52	28	0	0	32	0	0	0	0	0	0	0	60	20	
20	48	32	0	0	32	0	0	0	0	0	0	0	48	28	
21	40	44	0	0	24	0	0	0	0	0	0	0	44	56	
22	44	28	0	0	28	0	0	0	0	0	0	0	48	24	
23	40	64	0	0	24	0	0	0	0	0	0	0	44	48	
24	40	40	0	0	24	0	0	0	0	0	0	0	48	40	
25	32	56	0	0	20	0	0	0	0	0	0	0	36	68	
26	36	48	0	0	24	0	0	1	1	0	0	0	56	24	
27	64	36	0	0	40	0	0	0	0	0	0	0	48	52	
28	48	52	0	0	32	0	0	0	0	0	0	0	44	56	
29	44	52	0	0	28	0	0	0	0	1	0	0	44	68	
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
422	56	32	0	0	28	0	0	0	0	0	0	0	60	40	
423	44	48	0	0	32	0	0	0	0	0	0	0	40	60	
424	28	84	0	0	20	0	0	0	0	0	0	0	32	88	
425	48	32	0	0	24	0	0	0	0	0	0	0	44	24	
426	36	40	0	0	20	0	0	0	0	0	0	0	48	24	
427	48	84	0	0	36	0	0	0	0	0	0	0	44	80	
428	32	60	0	0	16	0	0	0	0	0	0	0	48	52	
429	64	16	0	0	48	0	0	0	0	0	0	0	64	20	
430	36	96	0	0	24	0	0	0	0	0	0	0	52	72	
431	48	40	0	0	24	0	0	0	0	0	0	0	48	40	
432	32	40	0	0	20	0	0	0	0	0	0	0	40	40	
433	0	0	0	0	0	0	0	0	0	0	1	0	28	60	
434	52	44	0	0	40	0	0	0	0	0	0	0	44	36	

435	52	28	0	0	36	0	0	0	0	0	0	0	52	36
436	48	16	0	0	32	0	0	0	0	0	0	0	44	20
437	32	56	0	0	20	0	0	0	0	0	0	0	40	48
438	44	36	0	0	28	0	0	0	0	0	0	0	48	44
439	56	60	0	0	40	0	0	0	0	0	0	0	44	56
440	36	48	0	0	24	0	0	0	0	0	0	0	56	48
441	60	24	0	0	36	0	0	0	0	0	0	0	68	20
442	48	28	0	0	32	0	0	0	0	0	0	0	48	40
443	44	48	0	0	28	0	0	0	0	0	0	0	52	36
444	40	32	0	0	24	0	0	0	0	0	0	0	44	24
445	32	56	0	0	16	0	0	0	0	0	0	0	48	52
446	72	20	0	0	56	1	0	0	0	0	0	0	52	36
447	28	52	0	0	16	0	0	0	0	0	0	0	32	48
448	56	24	0	0	36	0	0	0	0	0	0	0	64	20
449	44	68	0	0	32	0	0	0	0	0	0	0	52	68
450	44	40	0	0	28	0	0	0	0	0	0	0	52	40
451	48	36	0	0	32	0	0	0	0	0	0	0	48	40

	126	127	128	129	130	131	132	133	134	135	136	137	138	139	\
0	0	0	36	0	0	0	0	0	0	0	52	48	0	0	
1	0	0	32	0	0	0	0	0	0	0	48	40	0	0	
2	0	0	28	0	0	0	0	0	0	0	44	76	0	0	
3	0	0	36	0	0	0	0	0	0	0	60	48	0	0	
4	0	0	32	0	0	0	0	0	0	0	52	44	0	0	
5	0	0	36	0	0	0	0	0	0	0	44	40	0	0	
6	0	0	28	0	0	0	0	0	0	0	40	44	0	0	
7	0	0	28	0	0	0	0	0	0	0	48	44	0	0	
8	0	0	32	0	0	0	0	0	0	0	44	28	0	0	
9	0	0	40	0	0	0	0	0	0	0	52	36	0	0	
10	0	0	40	0	0	0	0	0	0	20	36	56	0	0	
11	0	0	24	0	0	0	0	0	0	0	40	52	0	0	
12	0	0	32	0	0	0	0	0	0	0	44	52	0	0	
13	20	0	36	0	0	0	0	0	0	24	52	12	0	0	
14	0	0	24	0	0	0	0	0	0	16	44	12	0	0	
15	0	0	28	0	0	0	0	0	0	0	48	36	0	0	
16	0	0	40	0	0	0	0	0	0	0	52	36	0	0	
17	0	0	32	0	0	0	0	0	0	0	48	36	0	0	
18	0	0	32	0	0	0	0	0	0	0	48	52	0	0	
19	0	0	36	0	0	0	0	0	0	0	64	24	0	0	
20	0	0	32	0	0	0	0	0	0	16	40	28	0	0	
21	0	0	32	0	0	0	0	0	0	0	40	56	0	0	
22	0	0	32	0	0	0	0	0	0	0	48	36	0	0	
23	0	0	28	0	0	0	0	0	0	0	48	44	0	0	
24	0	0	28	0	0	0	0	0	0	0	52	36	0	0	
25	0	0	24	0	0	0	0	0	0	0	44	68	0	0	
26	0	0	36	0	0	0	0	0	0	0	56	40	0	0	
27	0	0	28	0	0	0	0	0	0	0	48	56	0	0	
28	0	0	28	0	0	0	0	0	0	0	52	48	0	0	

29	0	0	28	0	0	0	0	0	0	0	44	68	0	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	0	0	40	0	0	0	0	0	0	0	52	40	0	0
423	0	0	28	0	0	0	0	0	0	0	44	56	0	0
424	0	0	20	0	0	0	0	0	0	0	40	80	0	0
425	0	0	32	0	0	0	0	0	0	0	48	20	0	0
426	24	16	32	0	0	0	0	0	0	0	52	72	0	0
427	0	0	32	0	0	0	0	0	0	0	36	88	0	0
428	0	0	32	0	0	0	0	0	0	0	52	44	0	0
429	0	0	44	0	0	0	0	0	0	0	60	20	0	0
430	0	0	36	0	0	0	0	0	0	24	32	72	0	0
431	0	0	32	0	0	0	0	0	0	0	48	36	0	0
432	0	0	24	0	0	0	0	0	0	0	40	44	0	0
433	0	0	20	0	0	0	0	0	0	0	32	56	0	0
434	0	0	32	0	0	0	0	0	0	0	40	48	0	0
435	0	0	32	0	0	0	0	0	0	0	52	36	0	0
436	16	0	28	0	0	0	0	0	0	16	40	16	0	0
437	0	0	28	0	0	0	0	0	0	0	44	40	0	0
438	0	0	28	0	0	0	0	0	0	0	48	40	0	0
439	0	0	28	0	0	0	0	0	0	0	44	52	0	0
440	0	0	40	0	0	0	0	0	0	16	40	48	0	0
441	0	0	48	0	0	0	0	0	0	0	68	20	0	0
442	0	0	32	0	0	0	0	0	0	0	44	56	0	0
443	0	0	32	0	0	0	0	0	0	0	52	40	0	0
444	0	0	28	0	0	0	0	0	0	0	44	20	0	0
445	0	0	32	0	0	0	0	0	0	0	40	52	0	0
446	0	0	36	0	0	0	0	0	0	0	52	36	0	0
447	0	0	20	0	0	0	0	0	0	0	40	40	0	0
448	16	0	44	0	0	0	0	0	0	0	52	32	0	0
449	0	0	40	0	0	0	0	0	0	0	48	60	0	0
450	0	0	36	0	0	0	0	0	0	0	48	40	0	0
451	0	0	32	0	0	0	0	0	0	0	52	40	0	0

	140	141	142	143	144	145	146	147	148	149	150	151	152	153	\
0	32	0	0	0	0	0	0	0	56	44	0	0	32	0	
1	28	0	0	0	0	0	0	0	48	0	0	0	28	0	
2	28	0	0	0	0	0	0	0	44	72	0	0	24	0	
3	36	0	0	0	0	0	0	0	64	40	0	0	40	0	
4	28	0	0	0	0	0	0	0	52	48	0	0	32	0	
5	32	0	0	0	0	0	0	20	36	56	0	0	40	0	
6	24	0	0	0	0	0	0	0	44	0	0	0	24	0	
7	28	0	0	0	0	0	0	0	48	40	0	0	24	0	
8	28	0	0	0	0	0	0	0	40	24	0	0	24	0	
9	32	0	0	0	0	0	0	20	44	36	0	0	44	0	
10	40	0	0	0	0	0	0	20	40	52	0	0	40	0	
11	28	0	0	0	0	0	0	0	40	36	0	0	24	0	
12	32	0	0	0	0	0	0	0	44	48	0	0	28	0	
13	52	0	0	0	0	0	0	24	48	0	0	0	48	0	

14	36	0	0	0	0	0	0	16	64	0	0	0	40	0
15	28	0	0	0	0	0	0	0	48	32	0	0	28	0
16	32	0	0	0	0	0	0	0	48	36	0	0	28	0
17	28	0	0	0	0	0	0	0	52	0	0	0	28	0
18	28	0	0	0	0	0	0	0	64	0	0	0	28	0
19	40	0	0	0	0	0	0	0	68	20	0	0	40	0
20	40	0	0	0	0	0	0	16	44	36	0	0	40	0
21	24	0	0	0	0	0	0	20	40	48	0	0	40	0
22	28	0	0	0	0	0	0	0	48	32	0	0	24	0
23	28	0	0	0	0	0	0	0	56	12	0	0	36	0
24	32	0	0	0	0	0	0	0	52	0	0	0	28	0
25	24	0	0	0	0	0	0	0	60	0	0	0	24	0
26	32	0	0	0	0	0	0	0	60	36	0	0	32	0
27	24	0	0	0	0	0	0	0	48	56	0	0	28	0
28	32	0	0	0	0	0	0	0	64	0	0	0	36	0
29	28	0	0	0	0	0	0	0	44	64	0	0	28	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	32	0	0	0	0	0	0	0	52	36	0	0	28	0
423	28	0	0	0	0	0	0	0	40	56	0	0	24	0
424	24	0	0	0	0	0	0	0	80	32	0	0	40	0
425	32	0	0	0	0	0	0	0	48	16	0	0	28	0
426	32	0	0	0	0	0	0	0	52	68	0	0	28	0
427	20	0	0	0	0	0	0	16	40	88	0	0	36	0
428	32	0	0	0	0	0	0	0	72	20	0	0	28	0
429	24	0	0	0	0	0	0	0	36	40	0	0	20	0
430	40	0	0	0	0	0	0	24	32	72	0	0	40	0
431	24	0	0	0	0	0	0	0	48	0	0	0	28	0
432	28	0	0	0	0	0	0	0	36	44	0	0	20	0
433	20	0	0	0	0	0	0	0	28	40	0	0	16	0
434	20	0	0	0	0	0	0	16	48	0	0	0	36	0
435	32	0	0	0	0	0	0	0	52	32	0	0	28	0
436	36	0	0	0	0	0	0	16	40	12	0	0	36	0
437	24	0	0	0	0	0	0	0	48	0	0	0	28	0
438	28	0	0	0	0	0	0	12	48	36	0	0	36	0
439	24	0	0	0	0	0	0	0	56	40	0	0	28	0
440	40	0	0	0	0	0	0	20	40	44	0	0	40	0
441	44	0	0	0	0	0	0	0	72	20	0	0	48	1
442	32	0	0	0	0	0	0	0	40	56	0	0	28	0
443	32	0	0	0	0	0	0	16	44	40	0	0	40	0
444	24	0	0	0	0	0	0	0	40	24	0	0	24	0
445	28	0	0	0	0	0	0	0	40	48	0	0	24	0
446	32	0	0	0	0	0	0	0	52	32	0	0	28	0
447	24	0	0	0	0	0	0	0	40	52	0	0	24	0
448	28	0	0	0	0	0	0	0	52	32	0	0	28	0
449	32	0	0	0	0	0	0	0	44	56	0	0	32	0
450	28	0	0	0	0	0	0	16	44	32	0	0	36	0
451	36	0	0	0	0	0	0	0	48	40	0	0	32	0

	154	155	156	157	158	159	160	161	162	163	164	165	166	167	\
0	0	0	0	0	0	0	0	6	-1	0	0	0	2	13	
1	0	0	0	0	0	0	0	7	0	0	0	0	1	17	
2	0	0	0	0	0	1	0	4	-2	0	0	0	2	-2	
3	0	0	0	0	0	0	0	7	0	0	0	1	1	27	
4	0	0	0	0	0	0	0	5	-1	0	0	0	2	9	
5	0	0	0	0	0	0	0	2	-6	0	0	0	1	-10	
6	0	0	0	0	0	0	0	1	0	0	0	0	1	3	
7	0	0	0	0	0	0	0	4	-1	0	0	0	1	7	
8	0	0	0	0	0	0	0	2	0	0	0	0	1	4	
9	0	0	0	0	0	0	0	3	-2	0	0	0	1	3	
10	0	0	0	0	0	0	0	5	-1	0	0	0	0	5	
11	0	0	0	0	0	0	0	6	-1	0	0	0	1	9	
12	0	0	0	0	0	0	0	6	0	0	0	0	0	22	
13	0	0	0	0	0	0	0	3	0	0	0	0	1	14	
14	0	0	0	0	0	0	0	10	0	0	0	0	2	40	
15	0	0	0	0	0	0	0	5	0	0	0	0	1	13	
16	0	0	0	0	0	0	0	2	0	0	0	0	0	5	
17	0	0	0	0	0	0	0	3	0	0	0	0	0	7	
18	0	0	0	0	0	0	0	2	0	0	0	0	1	3	
19	0	0	0	0	0	0	0	9	0	0	0	0	1	26	
20	0	0	0	0	0	0	0	4	0	0	0	0	3	7	
21	0	0	0	0	0	0	0	3	-1	0	0	0	0	3	
22	0	0	0	0	0	0	0	5	0	0	0	0	1	11	
23	0	0	0	0	0	0	0	5	0	0	0	0	1	21	
24	0	0	0	0	0	0	0	4	0	0	0	0	1	18	
25	0	0	0	0	0	0	0	8	0	0	0	0	-1	31	
26	0	0	0	0	0	0	0	1	-1	0	0	0	1	1	
27	0	0	0	0	0	0	0	7	0	0	0	0	1	18	
28	0	0	0	0	0	0	0	10	0	0	0	0	-1	37	
29	0	0	0	0	0	-1	0	12	0	0	0	0	-1	38	
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
422	0	0	0	0	0	0	0	3	0	0	0	0	1	11	
423	0	0	0	0	0	0	0	4	0	0	0	0	1	16	
424	0	0	0	0	0	0	0	3	0	0	0	1	1	19	
425	0	0	0	0	0	0	0	6	0	0	0	1	2	23	
426	0	0	0	0	0	0	0	4	0	0	0	0	1	14	
427	0	0	0	0	0	0	0	2	-3	0	0	0	0	-6	
428	0	0	0	0	0	0	0	4	0	0	0	0	0	13	
429	0	0	0	0	0	0	0	6	-5	0	0	1	1	-1	
430	0	0	0	0	0	1	0	3	-3	0	0	1	2	-4	
431	0	0	0	0	0	0	0	4	-1	0	0	0	0	8	
432	0	0	0	0	0	0	0	5	0	0	0	0	2	9	
433	0	0	0	0	0	0	0	4	0	0	0	0	0	10	
434	0	0	0	0	0	0	0	6	0	0	0	0	1	26	
435	0	0	0	0	0	0	0	6	0	0	0	0	1	15	
436	0	0	0	0	0	0	0	7	0	0	0	0	1	16	
437	0	0	0	0	0	0	0	4	-1	0	0	0	1	6	

438	0	0	0	0	0	0	0	8	0	0	0	0	0	26
439	0	0	0	0	0	0	0	3	-2	0	0	0	1	-2
440	0	0	0	0	0	0	0	5	0	0	0	0	1	9
441	0	1	0	0	0	0	0	3	0	0	0	0	1	8
442	0	0	0	0	0	0	0	7	-1	0	0	0	1	11
443	0	0	0	0	0	0	0	3	-1	0	0	0	0	2
444	0	0	0	0	0	0	0	5	0	0	0	0	2	12
445	0	0	0	0	0	0	0	2	-1	0	0	0	0	1
446	0	0	0	0	0	0	0	6	0	0	0	0	1	14
447	0	0	0	0	0	0	0	6	0	0	0	0	0	15
448	0	0	0	0	0	0	0	3	-1	0	0	0	1	4
449	0	0	0	0	0	0	0	8	-5	0	0	1	2	4
450	0	0	0	0	0	0	0	5	0	0	0	0	2	14
451	0	0	0	0	0	0	0	10	-1	0	0	0	0	20

	168	169	170	171	172	173	174	175	176	177	178	179	180	181	\
0	30	0	0	1	-1	0	0	1	1	3	14	0	-5	1	
1	26	0	0	5	0	0	0	0	1	17	29	0	-1	0	
2	19	0	0	6	-1	0	0	0	2	14	37	0	0	4	
3	45	0	0	9	-2	0	0	0	1	24	36	0	0	1	
4	31	0	0	1	0	0	0	1	1	2	18	0	-3	1	
5	7	0	-1	19	-2	0	0	1	4	36	84	0	-2	21	
6	10	0	0	7	-1	0	0	0	1	13	22	0	0	5	
7	13	0	0	8	-1	0	0	0	0	19	22	0	0	4	
8	11	1	0	5	0	0	0	1	2	11	31	1	0	3	
9	13	0	0	9	0	0	0	1	1	26	35	0	0	8	
10	8	0	0	7	0	0	0	1	1	19	29	0	0	1	
11	22	0	0	4	-1	0	0	1	1	7	21	0	-2	1	
12	26	0	0	3	-2	0	0	0	0	2	7	0	-3	0	
13	21	0	-1	14	0	0	0	0	1	32	44	0	-2	13	
14	58	0	0	12	0	0	0	0	2	45	61	0	0	4	
15	25	0	0	7	-1	0	0	1	2	14	31	0	0	2	
16	10	0	0	9	-1	0	0	1	2	22	42	0	0	7	
17	10	0	0	6	0	0	0	0	0	14	18	0	0	3	
18	11	0	0	3	0	0	0	0	0	15	17	0	0	3	
19	39	0	0	3	-1	0	0	1	1	9	23	0	0	0	
20	37	0	0	7	-1	0	0	1	3	13	50	0	0	2	
21	5	0	0	8	-1	0	0	1	1	18	26	0	0	6	
22	17	0	0	7	0	0	0	1	1	28	39	0	0	5	
23	27	0	0	4	-1	0	0	0	0	9	12	0	0	1	
24	31	0	0	11	0	0	0	0	1	27	39	0	0	6	
25	16	0	0	4	-4	0	0	0	1	-4	13	0	0	1	
26	10	0	0	9	0	0	0	1	2	21	36	0	0	8	
27	33	0	0	9	-3	0	0	0	3	15	39	0	0	2	
28	21	0	0	4	0	0	0	1	0	11	13	0	0	0	
29	12	0	0	4	-4	0	0	0	0	-4	-16	1	-10	0	
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
422	22	0	0	12	-3	0	0	0	2	26	45	0	0	8	

423	27	0	0	4	-2	0	0	1	2	4	25	0	-3	0
424	31	1	0	5	-9	0	0	1	7	-5	76	2	0	3
425	42	0	0	9	0	0	0	1	2	30	48	0	0	2
426	23	0	0	7	0	0	0	1	1	15	24	-1	0	2
427	0	0	0	4	-2	0	0	0	1	-2	4	0	0	2
428	12	0	0	4	0	0	0	0	0	17	20	0	0	0
429	5	0	0	10	0	0	0	1	2	31	44	0	0	5
430	19	0	-2	15	-2	0	0	0	0	13	24	-1	-5	16
431	15	0	0	5	0	0	0	1	1	16	25	0	0	1
432	25	0	0	6	-5	0	0	1	3	3	30	0	0	1
433	9	0	0	0	-7	0	0	0	0	-15	-12	0	0	0
434	40	0	0	6	-4	0	0	1	1	4	18	0	0	0
435	23	0	0	9	0	0	0	1	1	28	36	0	0	3
436	27	0	0	9	0	0	0	1	2	16	36	0	0	1
437	15	0	0	9	0	0	0	1	1	31	43	0	0	5
438	22	0	0	8	-2	0	0	1	0	12	17	0	0	1
439	5	0	0	7	0	0	0	1	0	34	37	0	0	7
440	21	0	0	10	-1	0	0	0	2	27	46	0	0	5
441	17	0	0	8	0	0	0	1	1	25	32	0	0	5
442	23	0	0	3	-4	0	0	0	0	-3	2	0	0	2
443	8	0	0	6	-3	0	0	0	0	9	14	0	0	3
444	35	0	0	6	-1	0	0	1	2	11	33	0	0	1
445	6	0	0	6	-1	0	0	0	1	11	25	0	0	4
446	27	0	0	7	0	0	0	1	2	20	37	0	0	1
447	20	0	0	1	-2	0	0	1	0	-1	2	0	0	0
448	11	0	0	10	0	0	0	0	2	29	47	0	0	7
449	20	1	0	1	-16	0	0	-1	0	-43	-38	1	0	1
450	33	0	0	9	0	0	0	0	2	29	44	1	0	4
451	21	0	0	7	0	0	0	1	2	21	33	0	0	0

	182	183	184	185	186	187	188	189	190	191	192	193	194	195	\
0	0	0	0	0	0	-10	-15	0	-3	0	0	0	0	0	
1	0	0	0	0	0	-1	1	0	-6	0	0	0	0	0	
2	0	0	0	0	0	24	26	-1	-5	1	0	0	0	0	
3	-2	0	0	-1	0	-1	-9	0	-8	1	0	0	0	0	
4	0	0	0	1	0	-7	-13	0	-3	0	0	0	0	-1	
5	0	0	0	0	2	66	95	0	-9	3	0	0	0	-1	
6	0	0	0	0	0	12	15	0	-4	0	0	0	0	0	
7	0	0	0	0	0	11	6	0	-6	1	0	0	0	0	
8	0	0	0	1	1	5	17	0	-3	0	0	0	0	-1	
9	0	0	0	0	0	29	32	0	-6	1	0	0	0	0	
10	0	0	0	1	1	8	16	0	-5	1	0	0	0	-1	
11	0	0	0	0	0	-1	0	0	-5	1	0	0	0	-1	
12	0	0	0	0	0	-14	-13	0	-5	0	0	0	0	-1	
13	0	0	0	0	0	21	25	0	-8	0	0	0	0	0	
14	0	0	0	0	0	12	7	0	-11	0	0	0	0	0	
15	-1	0	0	0	0	1	6	0	-6	1	0	0	0	0	
16	-1	0	0	1	2	17	32	0	-6	1	0	0	0	0	

17	0	0	0	0	0	6	7	0	-4	0	0	0	0	0
18	0	0	0	0	-1	11	3	0	-2	0	0	0	0	0
19	-6	0	0	0	0	-23	-23	0	-6	0	0	0	0	-1
20	-1	0	0	0	0	5	12	0	-6	1	0	0	0	0
21	-1	0	0	1	1	16	23	0	-5	1	0	0	0	-1
22	0	0	0	0	0	13	18	0	-6	0	0	0	0	-1
23	-4	0	0	0	0	-8	-11	0	-4	0	0	0	0	0
24	-1	0	0	0	0	9	6	0	-7	0	0	0	0	0
25	-10	0	0	0	2	-38	-14	0	-5	0	0	0	0	0
26	0	0	0	0	0	28	33	0	0	0	-5	1	0	-1
27	-3	0	0	0	1	-7	1	0	-8	1	0	0	0	0
28	-6	0	0	0	0	-19	-13	0	-7	0	0	0	0	0
29	0	0	0	0	1	-44	-27	0	-8	3	0	0	0	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	-2	0	0	0	1	15	22	0	-8	1	0	0	0	0
423	0	0	0	0	1	-7	2	0	-4	1	0	0	0	-1
424	-12	0	0	0	7	-27	53	0	-4	2	0	0	0	-1
425	0	0	0	0	0	6	3	0	-7	0	0	0	0	-1
426	0	0	0	0	0	3	5	0	-5	0	0	0	0	0
427	0	0	-1	0	0	1	-2	0	0	0	-3	2	0	0
428	-1	0	0	0	0	-1	3	0	-4	0	0	0	0	0
429	0	0	0	0	0	17	21	0	-8	2	0	0	0	-1
430	0	0	0	0	-1	35	13	0	0	0	-7	2	0	0
431	0	0	0	0	0	4	6	0	-5	0	0	0	0	0
432	-4	0	0	0	1	-8	1	0	-5	3	0	0	0	0
433	-10	0	0	0	0	-25	-19	0	-1	2	0	0	0	0
434	-7	0	0	1	0	-23	-27	0	-6	1	0	0	0	0
435	0	0	0	1	0	8	10	0	-7	0	0	0	0	-1
436	-2	0	0	1	1	-1	6	0	0	0	-8	0	0	0
437	0	0	0	0	0	15	18	0	-8	0	0	0	0	-1
438	-4	0	0	0	0	-11	-8	0	-8	1	0	0	0	0
439	0	0	0	0	-1	30	22	0	-4	0	0	0	0	0
440	-1	0	0	0	0	14	19	0	-7	1	0	0	0	0
441	0	0	0	0	0	18	15	0	-6	0	0	0	0	0
442	-8	0	0	0	-1	-16	-24	0	-4	2	0	0	0	0
443	-1	0	0	0	0	5	7	0	-4	2	0	0	0	0
444	-1	0	0	0	0	-1	-3	0	-6	1	0	0	0	0
445	0	0	0	0	1	16	26	0	-4	1	0	0	0	0
446	0	0	0	1	0	3	5	0	-6	0	0	0	0	0
447	-6	0	0	0	0	-15	-17	0	-3	1	0	0	0	0
448	0	0	0	0	1	29	40	0	-6	1	0	0	0	0
449	-16	0	0	-2	-1	-46	-58	0	-3	10	0	0	0	0
450	0	0	0	-1	0	11	13	0	-7	0	0	0	0	0
451	-2	1	0	0	1	-2	7	0	-9	1	0	0	0	0

	196	197	198	199	200	201	202	203	204	205	206	207	208	209	\
0	-1	-10	-22	0	0	5	-1	0	0	0	1	14	22	0	
1	-1	-15	-25	0	0	4	0	0	0	0	0	8	12	0	

2	-2	-8	-28	0	0	1	-2	0	0	0	1	-9	-1	0
3	-1	-23	-35	0	0	3	0	0	0	0	1	9	18	0
4	-1	-7	-17	0	0	4	-1	0	0	0	1	8	16	0
5	-2	-14	-39	0	0	1	-12	0	0	0	0	-38	-42	0
6	0	-9	-14	0	-2	0	0	0	0	0	0	-3	-1	0
7	0	-13	-17	0	0	0	0	0	0	0	0	-2	2	0
8	-1	-7	-20	0	0	0	0	0	0	0	0	0	-3	1
9	-1	-15	-24	0	0	0	-4	0	0	0	0	-10	-4	0
10	-1	-9	-15	0	0	1	-1	0	0	0	0	-2	-4	0
11	-1	-8	-23	0	0	4	0	0	0	0	0	8	13	0
12	0	-10	-14	0	0	5	0	0	0	0	0	21	22	0
13	-1	-22	-31	0	0	2	-5	0	0	0	0	-5	-4	0
14	-2	-46	-59	0	0	3	0	0	0	0	1	4	9	0
15	-1	-11	-24	0	0	1	0	0	0	0	0	5	8	0
16	-1	-13	-26	0	-2	0	0	0	0	0	0	-5	-10	0
17	0	-10	-14	0	0	0	0	0	0	0	0	0	1	0
18	0	-11	-13	0	0	0	-2	0	0	0	0	-2	2	0
19	-1	-20	-33	0	0	7	0	0	0	0	0	22	28	0
20	-2	-13	-40	0	0	1	0	0	0	0	1	4	14	0
21	-1	-12	-18	0	-3	0	0	0	0	0	0	-7	-9	0
22	-1	-22	-30	0	0	2	-2	0	0	0	0	0	0	0
23	0	-18	-22	0	0	4	0	0	0	0	0	12	15	0
24	-1	-24	-35	0	-1	1	0	0	0	0	1	0	7	0
25	-1	-21	-31	0	-1	8	0	0	0	0	-1	31	13	0
26	-1	-10	-22	0	0	0	-3	0	0	0	0	-11	-9	0
27	-2	-16	-33	0	0	2	0	0	0	0	0	14	20	0
28	0	-27	-29	0	0	9	0	0	0	0	-1	30	7	0
29	1	-12	6	-1	0	11	0	0	0	0	-1	35	14	0
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	-2	-21	-36	0	-2	1	0	0	0	0	0	-1	1	0
423	-1	-8	-23	0	0	2	0	0	0	0	0	8	11	0
424	-3	-10	-50	-1	0	7	0	0	0	0	-3	24	-14	2
425	-2	-22	-39	0	0	1	0	0	0	0	1	3	12	0
426	-1	-13	-22	0	0	1	0	0	0	0	0	5	10	0
427	0	4	-1	0	0	1	0	0	0	0	0	-1	3	0
428	0	-17	-19	0	0	2	0	0	0	0	0	6	5	0
429	-1	-14	-23	0	0	1	-5	0	0	0	0	-11	-10	0
430	-1	-5	-19	1	0	4	-9	0	0	0	1	-23	-6	0
431	-1	-12	-20	0	0	2	-1	0	0	0	0	2	4	0
432	-2	-6	-26	0	0	2	0	0	0	0	0	9	12	0
433	0	4	3	0	0	6	0	0	0	0	0	17	14	0
434	-1	-11	-25	0	0	5	0	0	0	0	1	20	29	0
435	-1	-28	-34	0	0	1	-1	0	0	0	0	1	5	0
436	-2	-18	-34	0	0	3	0	0	0	0	0	10	11	0
437	-1	-35	-45	0	0	1	-2	0	0	0	0	-2	0	0
438	0	-17	-10	0	0	5	0	0	0	0	0	19	12	0
439	-1	-14	-19	0	0	1	-4	0	0	0	1	-14	-7	0
440	-1	-17	-32	0	0	0	0	0	0	0	0	0	3	-1

441	-1	-15	-22	0	0	0	0	0	0	0	0	0	5	0
442	-1	-5	-12	0	-1	7	0	0	0	0	1	17	26	0
443	0	-8	-10	0	0	0	0	0	0	0	0	0	1	0
444	-2	-10	-31	0	0	2	0	0	0	0	1	5	16	0
445	-1	-4	-15	0	-2	0	0	0	0	0	0	-6	-8	0
446	-2	-17	-30	0	0	2	0	0	0	0	0	3	7	0
447	0	-5	-10	0	0	6	0	0	0	0	0	16	21	0
448	-1	-14	-27	0	-3	0	0	0	0	0	0	-12	-14	0
449	-1	18	10	0	-1	10	-1	0	0	2	1	24	38	1
450	-2	-27	-43	0	0	1	0	0	0	0	1	3	14	1
451	-1	-20	-27	0	0	6	-1	0	0	0	0	8	4	0

	210	211	212	213	214	215	216	217	218	219	220	221	222	223	\
0	-2	0	0	0	0	1	0	-4	-2	0	-6	0	0	0	
1	0	2	0	0	0	0	0	6	11	0	0	1	-8	0	
2	0	4	0	0	0	0	1	31	42	0	0	0	-3	6	
3	0	5	-2	0	0	0	0	9	12	1	-6	0	0	0	
4	-1	0	0	0	0	1	0	-3	-1	0	-5	0	0	0	
5	-1	19	0	0	0	1	3	40	65	0	0	6	-24	0	
6	0	6	0	0	0	0	0	14	17	1	0	1	-11	0	
7	0	6	-1	0	0	0	0	14	16	0	0	0	-7	0	
8	0	4	0	0	0	1	2	7	22	0	0	0	-5	0	
9	0	8	0	0	0	0	0	26	30	0	0	1	-5	1	
10	0	4	0	0	0	1	1	18	25	0	0	0	-8	0	
11	0	1	0	0	0	0	1	0	10	0	0	0	-4	0	
12	-2	0	0	0	0	0	0	-10	-7	0	0	0	-5	1	
13	-1	13	0	0	0	0	1	27	34	0	0	3	-7	0	
14	0	8	0	0	0	0	1	33	41	0	0	3	-10	0	
15	0	5	-1	0	0	0	1	7	17	1	0	1	-13	0	
16	0	8	-1	0	0	1	2	19	36	1	0	0	-8	1	
17	0	4	0	0	0	0	0	10	12	0	-10	0	0	0	
18	0	3	0	0	0	0	0	10	8	1	-9	0	0	0	
19	0	0	-2	0	0	0	0	-6	-1	0	-4	1	0	0	
20	0	5	-1	0	0	0	1	11	26	0	0	2	-6	0	
21	0	7	-1	0	0	1	1	18	26	0	0	2	-4	0	
22	0	6	0	0	0	0	1	21	28	0	0	1	-5	0	
23	0	2	-2	0	0	0	0	0	1	0	0	2	-7	0	
24	0	8	-1	0	0	0	0	21	24	0	0	1	-10	0	
25	0	1	-7	0	0	0	2	-19	0	2	-18	0	0	0	
26	0	8	0	0	0	1	1	20	31	0	0	1	-9	1	
27	0	6	-2	0	0	0	1	3	15	1	0	1	-11	2	
28	0	0	-2	0	0	0	0	-6	-18	0	-7	0	0	0	
29	-5	0	0	0	0	0	0	-24	-16	1	0	0	-13	0	
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
422	0	10	-2	0	0	0	2	23	35	0	0	1	-9	0	
423	0	2	-3	0	0	1	1	-2	11	0	-3	0	0	0	
424	0	4	-10	0	0	0	7	-14	62	2	0	0	-20	0	
425	0	5	0	0	0	0	1	17	24	1	0	1	-11	0	

426	0	4	0	0	0	0	0	9	14	0	0	0	-7	0
427	0	3	-2	0	0	0	0	-4	-2	0	0	1	-4	5
428	0	2	0	0	0	0	0	6	9	0	0	0	-9	0
429	0	7	0	0	0	0	1	23	32	1	0	1	-3	8
430	-3	16	-1	0	0	0	-1	14	3	-1	0	4	-8	4
431	0	3	0	0	0	0	0	12	18	0	0	1	-7	0
432	0	3	-4	0	0	1	2	-3	13	0	0	0	-5	0
433	0	0	-8	0	0	0	0	-19	-16	0	-3	0	0	0
434	0	2	-5	0	0	1	0	-9	-5	1	0	2	-15	0
435	0	6	0	0	0	1	0	17	19	0	0	0	-6	0
436	0	5	-1	0	0	1	2	8	22	0	0	3	-14	0
437	0	7	0	0	0	1	1	27	34	0	0	0	-7	0
438	0	4	-3	0	0	0	0	1	0	0	0	1	-10	0
439	0	7	0	0	0	0	0	33	34	0	0	1	-5	0
440	0	8	0	0	0	0	1	22	32	0	0	2	-9	0
441	0	6	0	0	0	0	0	19	20	0	0	2	-10	0
442	0	2	-5	0	0	0	0	-9	-10	0	0	0	-1	0
443	0	5	-2	0	0	0	0	6	7	0	0	2	-1	2
444	0	4	-1	0	0	0	1	5	14	0	0	0	-8	0
445	0	6	0	0	0	0	1	12	22	0	0	1	-5	0
446	0	4	0	0	0	1	1	12	22	0	0	0	-7	0
447	0	0	-4	0	0	0	0	-11	-11	0	-6	0	0	0
448	0	9	0	0	0	0	1	36	49	1	-4	2	0	0
449	0	1	-15	0	0	-2	0	-44	-49	-1	0	0	-1	12
450	0	6	0	0	0	0	0	20	26	1	0	2	-12	0
451	0	2	0	0	0	0	1	10	22	0	0	2	-3	0

	224	225	226	227	228	229	230	231	232	233	234	235	236	237	\
0	0	0	0	-24	-29	0	0	2	-6	0	0	0	2	-12	
1	0	0	0	-21	-26	0	0	2	-7	0	0	0	2	-16	
2	0	0	-3	18	-13	0	0	2	-4	7	0	0	-2	20	
3	0	0	0	-18	-22	2	0	1	-6	0	0	0	2	-12	
4	0	0	0	-25	-30	0	0	1	-6	0	0	0	2	-12	
5	0	-1	0	-61	-59	0	0	11	-43	0	0	0	3	-111	
6	0	0	1	-30	-13	1	0	2	-17	0	0	0	4	-46	
7	0	0	0	-15	-16	0	0	0	-8	0	0	0	2	-20	
8	0	0	1	-14	-5	0	0	1	-6	0	0	0	2	-13	
9	0	0	0	-5	2	0	0	4	-8	0	0	0	3	-10	
10	0	0	-1	-26	-39	0	0	2	-12	0	0	0	-2	-35	
11	0	0	-1	-9	-27	0	0	3	-6	0	0	0	0	-10	
12	0	0	0	-7	-11	1	0	2	-3	0	0	0	0	-1	
13	0	0	0	-9	-12	2	0	8	-8	0	0	0	1	11	
14	0	0	0	-20	-23	1	0	5	-5	0	0	0	3	0	
15	0	0	0	-28	-21	1	0	2	-11	0	0	0	4	-22	
16	0	0	0	-18	-22	2	0	0	-9	3	0	0	0	-19	
17	0	0	0	-31	-24	0	-6	0	0	0	0	0	0	-20	
18	0	0	2	-32	-2	2	0	0	-13	0	0	0	6	-41	
19	0	0	0	-11	-17	0	0	4	-2	0	0	0	1	7	

20	0	0	-2	-19	-41	0	0	4	-7	0	0	0	2	-8
21	0	0	0	-6	0	1	0	6	-9	2	0	0	3	-1
22	0	0	0	-7	-1	1	0	5	-7	0	0	0	2	0
23	0	0	0	-20	-28	1	0	6	-10	0	0	0	0	-13
24	0	0	-1	-23	-43	1	0	2	-10	0	0	0	1	-20
25	0	0	5	-69	-8	1	0	3	-16	0	0	1	4	-50
26	0	-2	0	-18	-12	1	0	1	-11	0	0	-1	2	-25
27	0	0	-2	-18	-38	1	0	2	-7	0	0	0	1	-12
28	0	0	2	-27	-4	0	-4	0	0	0	0	0	2	-16
29	0	0	1	-33	-5	0	0	0	-8	0	0	0	1	-19
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	0	0	-1	-24	-36	0	0	3	-12	0	0	0	2	-26
423	0	0	0	-14	-12	0	0	2	-7	0	0	0	2	-15
424	0	-1	-1	-92	-107	5	0	3	-39	0	0	0	4	-151
425	0	0	0	-29	-31	3	0	3	-12	0	0	0	6	-21
426	0	0	0	-15	-24	1	0	2	-8	0	0	0	2	-18
427	0	0	-1	17	-7	1	0	2	-9	0	0	0	1	-21
428	0	0	1	-28	-14	0	0	1	-6	0	0	0	0	-20
429	0	0	1	18	29	1	0	4	-4	0	0	0	2	-1
430	0	1	-4	10	-45	0	0	11	-14	1	0	1	-5	4
431	0	0	0	-17	-18	0	0	4	-10	0	0	0	3	-20
432	0	-1	-2	-7	-35	0	0	2	-3	5	0	0	-1	12
433	0	-1	0	-10	-11	0	-4	0	0	0	0	0	0	-9
434	0	0	1	-44	-26	3	0	2	-15	0	0	0	7	-31
435	0	0	0	-16	-21	1	0	3	-7	0	0	0	1	-3
436	0	0	-1	-31	-42	1	0	3	-4	0	0	0	2	-2
437	0	0	0	-21	-31	1	0	2	-13	0	0	0	2	-37
438	0	0	1	-18	-8	0	0	2	-6	0	0	0	2	-7
439	0	0	-1	-10	-23	0	0	3	-10	0	0	0	1	-25
440	0	0	0	-25	-32	0	0	4	-9	0	0	0	3	-15
441	0	0	0	-25	-30	0	0	3	-12	0	0	0	3	-21
442	0	0	0	-3	-10	1	0	4	-1	0	0	0	0	6
443	0	0	0	7	8	0	0	3	-1	1	0	0	1	7
444	0	0	0	-22	-19	2	0	2	-13	0	0	0	6	-25
445	0	0	1	-13	0	0	0	1	-8	0	0	0	2	-23
446	0	0	-1	-22	-34	1	0	1	-7	0	0	0	3	-13
447	0	0	0	-18	-19	1	0	0	-8	0	0	0	1	-22
448	0	0	2	-5	21	1	0	3	-8	0	0	0	8	-14
449	-2	1	-2	23	0	-4	0	19	-6	0	0	3	-7	72
450	0	0	1	-28	-16	2	0	7	-14	0	0	0	6	-16
451	0	0	1	-3	4	0	0	11	-6	0	0	0	2	13

	238	239	240	241	242	243	244	245	246	247	248	249	250	251	\
0	15	0	0	8	-10	0	0	0	5	-3	52	0	0	15	
1	1	0	0	5	-7	0	0	0	3	-5	27	0	0	9	
2	-2	0	0	5	-4	4	0	0	0	20	23	0	0	10	
3	18	0	0	9	-7	0	0	0	4	7	51	0	0	15	
4	8	0	0	8	-10	0	0	-1	4	-4	43	0	0	15	

5	-95	2	0	19	-48	0	0	1	8	-114	-72	2	0	31
6	-1	1	0	3	-11	0	0	0	4	-19	21	0	0	7
7	4	0	0	2	-9	0	0	0	3	-16	21	0	0	6
8	10	1	0	2	-10	0	0	0	6	-19	43	0	0	7
9	25	0	0	4	-7	0	0	1	4	-8	27	0	0	7
10	-54	0	-2	11	-18	0	0	0	-5	-34	-76	-1	-1	16
11	-17	0	0	6	-9	0	0	0	0	-8	-5	0	0	3
12	4	0	0	5	-5	0	0	0	1	-1	7	0	0	8
13	22	1	0	11	-3	0	0	0	4	23	63	0	0	20
14	35	0	0	8	-2	0	0	0	3	19	52	0	0	12
15	33	1	0	5	-3	0	0	0	7	10	107	0	0	9
16	-12	1	0	1	-11	0	0	0	4	-29	10	0	0	7
17	-12	0	0	1	-4	0	0	0	1	-6	11	0	0	8
18	24	1	0	5	-17	0	0	0	7	-34	50	0	0	11
19	20	0	0	14	-2	0	0	0	4	33	67	0	0	18
20	19	0	0	7	-6	0	0	0	5	6	67	0	0	11
21	33	1	0	14	-22	0	0	1	7	-21	49	0	0	18
22	23	0	0	8	-7	0	0	0	3	8	39	0	0	8
23	-2	0	0	10	-10	0	0	0	1	-10	8	0	0	10
24	-8	0	0	4	-8	0	0	0	2	-7	29	0	0	12
25	-3	1	0	9	-22	0	0	1	6	-48	23	0	0	12
26	2	3	0	5	-14	0	0	1	8	-25	59	1	0	18
27	0	0	0	5	-3	0	0	0	3	11	45	0	0	11
28	8	0	0	6	-7	0	0	0	0	-4	0	0	0	9
29	0	-1	0	4	-6	0	0	0	-1	-8	-33	0	0	7
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	-5	0	0	5	-4	0	0	0	2	7	32	0	0	13
423	5	0	0	5	-11	0	0	0	2	-14	7	0	0	10
424	-85	10	0	6	-46	0	0	0	10	-184	-24	6	0	5
425	50	2	0	3	-5	0	0	0	6	0	74	0	0	8
426	3	0	0	3	-4	0	0	0	4	-2	47	0	0	11
427	-3	1	0	9	-18	0	0	0	2	-56	-23	1	0	15
428	-10	0	0	2	-8	0	0	0	0	-19	-8	0	0	9
429	17	1	0	8	-3	0	0	0	2	24	43	0	0	12
430	-50	0	0	14	-8	0	0	1	-5	-16	-88	0	0	17
431	13	0	0	6	-9	0	0	0	5	-2	47	-1	0	20
432	3	1	0	5	-9	0	0	0	2	-10	13	1	0	11
433	-12	0	-10	0	0	0	0	0	0	-32	-24	0	0	1
434	64	3	0	3	-13	0	0	0	6	-19	67	1	0	9
435	10	0	0	10	-7	0	0	0	2	17	38	0	0	10
436	23	1	0	8	-2	0	0	0	5	18	64	0	0	13
437	-7	1	0	4	-13	0	0	0	3	-28	12	0	0	8
438	18	0	0	4	-6	0	0	0	5	0	46	0	0	14
439	-15	0	0	7	-9	0	0	0	3	-9	19	0	0	10
440	16	0	0	7	-10	0	0	0	6	-10	51	0	0	16
441	11	0	0	7	-2	0	0	0	4	18	63	0	0	17
442	16	0	0	7	-4	0	0	0	1	10	24	0	0	5
443	17	0	0	5	-6	0	0	1	3	-4	18	0	0	6

444	54	2	0	4	-4	0	0	0	7	2	99	0	0	7
445	-1	0	0	3	-11	0	0	0	4	-27	12	0	0	5
446	22	0	0	8	-4	0	0	0	6	26	89	0	0	14
447	-4	1	0	1	-9	0	0	0	2	-22	3	0	0	2
448	75	1	0	12	-5	0	0	0	10	27	137	0	0	22
449	12	0	0	18	-34	0	0	1	-8	-75	-146	0	0	20
450	63	2	0	8	-7	0	0	0	7	3	94	0	0	11
451	33	0	0	20	-6	0	0	0	2	38	60	-1	0	23

	252	253	254	255	256	257	258	259	260	261	262	263	264	265	\
0	-8	0	0	0	5	17	70	0	0	13	-4	0	0	0	
1	-5	0	0	0	2	11	34	0	0	11	-2	0	0	0	
2	-5	0	0	0	2	-3	20	1	0	11	-3	0	0	0	
3	-5	0	0	0	3	28	63	0	0	15	-3	0	0	0	
4	-7	0	0	0	4	16	63	0	0	9	0	0	0	0	
5	-25	0	0	0	5	29	85	0	0	19	-11	0	0	0	
6	-6	0	0	0	1	1	15	0	0	7	-2	0	0	0	
7	-4	0	0	0	1	4	14	0	0	8	-2	0	0	0	
8	-7	0	0	0	6	5	62	0	0	9	-3	0	0	0	
9	-3	0	0	1	1	13	22	0	0	10	-2	0	0	1	
10	-13	0	0	0	-3	-12	-37	0	0	12	-5	0	0	0	
11	-5	0	0	0	0	-8	-6	0	0	4	-4	0	0	0	
12	-5	0	0	0	1	4	13	0	0	7	-4	0	0	0	
13	-2	0	0	0	5	61	103	0	-1	19	-1	0	0	0	
14	-1	0	0	0	1	29	47	0	0	13	0	0	0	0	
15	-2	0	0	0	3	19	45	0	0	9	-1	0	0	0	
16	-3	0	0	0	4	16	60	0	0	11	-2	0	0	0	
17	-2	0	0	0	0	14	20	0	0	8	-1	0	0	0	
18	-9	0	0	0	3	-1	26	0	0	8	-1	0	0	0	
19	-2	0	0	0	3	54	86	0	0	9	-1	0	0	0	
20	-4	0	0	0	4	21	62	0	0	11	-2	0	0	0	
21	-17	0	0	1	2	-8	15	0	0	12	-5	0	0	1	
22	-3	0	0	0	2	17	39	0	0	9	-2	0	0	0	
23	-6	0	0	0	0	9	18	0	0	9	-3	0	0	0	
24	-4	0	0	0	1	20	37	0	0	15	-2	0	0	0	
25	-15	0	0	0	3	-30	-1	0	0	9	-4	0	0	0	
26	-5	0	0	1	7	45	129	0	0	21	-2	0	0	1	
27	-3	0	0	0	3	19	49	0	0	13	-2	0	0	0	
28	-6	0	0	0	-1	2	-14	0	0	6	-2	0	0	0	
29	-7	0	0	0	-1	-9	-20	0	0	6	-6	0	0	0	
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
422	-4	0	0	0	2	31	49	0	0	15	-3	0	0	0	
423	-10	0	0	0	1	-9	6	0	0	11	-7	0	0	1	
424	-30	0	0	0	8	-124	2	3	0	4	-8	0	0	0	
425	-4	0	0	0	4	13	56	0	0	11	-2	0	0	0	
426	-4	0	0	0	5	23	74	0	0	12	-2	0	0	0	
427	-15	0	0	0	1	-26	-6	0	0	10	-6	0	0	0	
428	-5	0	0	0	0	8	12	0	0	9	-1	0	0	0	

429	-2	0	0	1	-4	37	-4	0	0	11	-1	0	0	0
430	-7	0	0	0	0	17	24	0	-3	29	-7	0	0	0
431	-7	0	0	0	2	34	57	0	0	14	-2	0	0	0
432	-14	0	0	0	6	-6	79	0	0	23	-13	0	0	0
433	-8	0	0	0	0	-24	-25	0	0	2	-6	0	0	0
434	-9	0	0	0	0	4	2	0	0	10	-4	0	0	0
435	-2	0	0	0	1	23	33	0	0	11	-1	0	0	0
436	-2	0	0	0	4	28	62	0	0	12	-1	0	0	0
437	-4	0	0	1	1	5	15	0	0	11	-2	0	0	1
438	-5	0	0	0	3	23	50	0	0	16	-3	0	0	0
439	-5	0	0	0	2	8	25	0	0	9	-1	0	0	0
440	-8	0	0	0	4	24	65	-1	0	23	-6	0	0	0
441	-2	0	0	0	2	57	82	0	0	16	-1	0	0	0
442	-5	0	0	0	0	2	10	0	0	6	-6	0	0	0
443	-7	0	0	1	3	5	37	0	0	16	-4	0	0	0
444	-3	0	0	0	3	12	49	0	0	9	-2	0	0	0
445	-9	0	0	0	3	-11	17	0	0	8	-5	0	0	0
446	-4	0	0	0	5	28	84	0	0	9	-1	0	0	0
447	-10	0	0	0	1	-20	-9	0	0	4	-8	0	0	0
448	-3	0	0	0	5	69	129	0	0	21	-2	0	0	0
449	-36	0	0	1	-8	-71	-161	0	0	22	-30	0	0	1
450	-6	0	0	0	3	17	56	0	0	15	-3	0	0	0
451	-6	0	0	0	2	44	60	0	0	12	-2	0	0	0

	266	267	268	269	270	271	272	273	274	275	276	277	278	279
0	3	25	62	0	0	9	0	0	0	0	2	23	49	8
1	2	21	43	0	0	8	0	0	0	0	2	20	38	6
2	3	11	48	0	0	9	-2	0	0	0	3	12	49	10
3	3	36	68	0	0	12	-2	0	0	0	2	34	61	1
4	2	21	48	0	0	13	-3	0	0	0	3	25	62	7
5	3	20	49	0	0	12	-2	0	0	0	2	13	31	14
6	1	9	18	0	0	6	0	0	0	0	1	14	20	1
7	0	14	20	0	0	8	-1	0	0	0	0	15	19	1
8	3	15	48	0	0	7	-1	0	0	0	2	12	30	1
9	1	23	29	0	0	10	-1	0	0	0	0	20	25	10
10	0	6	3	0	0	9	-2	0	0	0	0	12	19	3
11	0	-1	5	0	0	4	-2	0	0	0	1	4	17	1
12	0	4	8	0	0	6	-2	0	0	0	0	8	12	10
13	3	47	79	0	0	12	0	0	0	0	2	28	48	6
14	1	29	46	0	0	12	0	0	0	0	1	39	54	1
15	2	20	41	0	0	7	0	0	0	0	1	17	31	1
16	2	25	47	0	0	9	-1	0	0	0	2	19	41	10
17	0	16	19	0	0	6	0	0	0	0	0	17	20	1
18	1	16	25	0	0	5	0	0	0	0	0	18	22	1
19	2	28	43	0	0	7	0	0	0	0	1	25	38	1
20	4	18	64	0	0	9	-1	0	0	0	3	17	54	1
21	1	10	21	0	0	8	-1	0	0	0	1	11	19	1
22	2	19	37	0	0	8	-1	0	0	0	1	19	34	1

23	1	16	28	0	0	6	0	0	0	0	1	18	28	1
24	2	35	57	0	0	13	0	0	0	0	2	35	57	1
25	2	5	22	0	0	6	0	0	0	0	1	20	29	16
26	4	54	98	0	0	15	-1	0	0	0	2	44	68	14
27	3	25	57	0	0	12	-1	0	0	0	3	25	54	10
28	-1	11	-3	0	0	5	0	0	0	0	-1	17	3	2
29	-1	-5	-16	0	0	7	-3	0	0	0	-1	3	-6	2
..	...	...	...	...	...	...	...	...	...	...	...	...	...	...
422	3	33	57	0	0	14	-2	0	0	0	3	32	56	1
423	1	4	18	0	0	9	-3	0	0	1	1	9	23	1
424	7	-24	82	0	0	10	-2	0	0	1	5	36	115	9
425	3	24	60	0	0	10	0	0	0	0	3	24	52	1
426	3	24	59	0	0	8	0	0	0	0	2	20	40	1
427	1	-9	2	0	0	6	-3	0	0	0	0	-2	6	10
428	0	20	22	0	0	6	0	0	0	0	0	23	26	1
429	1	32	45	0	0	11	-2	0	0	0	3	16	49	16
430	1	17	30	0	-3	19	-4	0	0	0	1	12	25	10
431	1	30	42	0	0	8	0	0	0	0	1	20	29	6
432	8	18	127	0	0	17	-7	0	0	0	5	15	84	10
433	0	-13	-16	0	0	2	-5	0	0	0	0	-7	-8	3
434	-1	11	1	0	0	10	0	0	0	0	0	24	25	1
435	1	25	37	0	0	9	0	0	0	0	1	24	33	1
436	3	24	49	0	0	9	0	0	0	0	2	19	36	1
437	1	19	35	0	0	10	0	0	0	1	2	25	43	1
438	1	33	41	0	0	13	-1	0	0	0	0	30	35	1
439	1	17	30	0	0	8	0	0	0	0	1	21	33	1
440	2	30	53	-1	0	16	-3	0	0	0	1	24	41	1
441	2	54	75	0	0	11	0	0	0	0	1	40	55	1
442	0	-4	2	0	0	6	-6	0	0	0	0	-3	0	1
443	2	33	58	0	0	10	-2	0	0	0	1	17	29	10
444	3	18	50	0	0	7	-1	0	0	0	2	14	37	1
445	1	3	17	0	0	7	-2	0	0	0	1	8	17	1
446	3	20	49	0	0	7	0	0	0	0	2	17	39	1
447	1	-8	0	0	0	4	-5	0	0	0	0	-4	0	1
448	3	50	82	0	0	15	-1	0	0	0	2	38	62	10
449	-2	-39	-63	1	0	16	-28	0	0	1	1	-44	-33	2
450	3	29	61	0	0	12	0	0	0	0	2	25	46	1
451	1	26	38	0	0	10	-1	0	0	0	1	21	32	1

[452 rows x 280 columns]

(d) The way to do this is to build a model, that relates features, to outcomes. In this case with multiple numerical outcomes, you could use linear regression. Once you've fit that model, you put the new patients's features into that model, to predict how likely they are to have a certain condition.

After this, if any features don't help the prediction, or if there are too many features, some can be removed from the model.

Written Questions

1. (a) $P(X=1) = \frac{1}{4} + \frac{1}{3} = \frac{7}{12}$

   (b) $P(X=1|Y=1) = \frac{P(X=1 \cap Y=1)}{P(Y=1)} = \frac{2}{3}$

   (c) $E(X) = 0(\frac{1}{4} + \frac{1}{6}) + 1(\frac{1}{4} + \frac{1}{3}) = \frac{7}{12}$

   $var(X) = 0^2(\frac{5}{12}) + 1^2(\frac{7}{12}) - (\frac{7}{12})^2 = \frac{35}{144} = 0.243$

   (d) $var(X|Y=1) = E((X - E(X \mid Y=1))^2 \mid Y=1)$

   $= E(X^2 \mid Y=1) - E(X \mid Y=1)^2$

   $= 0(\frac{1}{6}) + (\frac{1}{3}) - 0^2(\frac{1}{6}) - 1^2(\frac{1}{3}) = 0$

   (e) $E(X^3 + X^2 + 3Y^7 \mid Y=1) = E(X^3 \mid Y=1) + E(X^2 \mid Y=1) + 3E(Y^7 \mid Y=1)$

   $= 0^3(\frac{1}{6}) + 1^3(\frac{1}{3}) + 0^2(\frac{1}{6}) + 1^2(\frac{1}{3}) + 3 * (1^7)(1)$

   $= \frac{11}{3}$

2. Normal of 2d subspace = [1,1,1] x [1,0,0] = [0,1,-1]

   point p1 = [3,3,3]

   p2 = [1,2,3]

   p3 = [0,0,1]

3. Let $Xi = \begin{cases} 1, & \text{if ith toss is heads} \\ 0, & \text{otherwise} \end{cases}$

   Since the Xi are i.i.d. and binomially distributed we know

   $\mu = EX_i = np = 1(2/3) = \frac{2}{3}$,

   $\sigma^2 = var(X_i) = np(1-p) = 1(\frac{2}{3})(\frac{1}{3}) = \frac{2}{9}$

   Now let $S_{100} = \sum_{100}^{i=1} X_i$ count the number of heads we get out of 100 coin tosses.

   By the central limit theorem we get

   $$P(S_{100} \leq 50) = P(\frac{S_{100} - 100\mu}{\sqrt{100\sigma^2}} \leq \frac{50 - \frac{200}{3}}{\sqrt{\frac{200}{9}}})$$

   $= P(Z \leq -3.535) \approx 0.0003$