

## 导入实验所用的包

```
1 from mlxtend.preprocessing import TransactionEncoder
2 from mlxtend.frequent_patterns import apriori
3 from mlxtend.frequent_patterns import association_rules
4 from mlxtend.frequent_patterns import fpmmax, fpgrowth
5 import pandas as pd
6 import numpy as np
7 from IPython.core.interactiveshell import InteractiveShell
8 InteractiveShell.ast_node_interactivity = "all"
9
```

## 进行数据的读取和预处理--将数据存到列表中

```
1 f = open(r"C:\Users\38061\Jupyter_Notebook\shujuwajue\TheTwo\数据集-T10I4D100K.txt")
2 line = f.readline()
3 lines = []
4 while line:
5     line_data = line.split()
6     lines.append(line_data)
7     line = f.readline()
8 f.close()
9 data = lines
10 data
```

```
1 [['25',
2   '52',
3   '164',
4   '240',
5   '274',
6   '328',
7   '368',
8   '448',
9   '538',
10  '561',
11  '630',
12  '687',
13  '730',
14  '775',
15  '825',
16  '834'],
17 ['39', '120', '124', '205', '401', '581', '704', '814', '825', '834'],
18 ['35', '249', '674', '712', '733', '759', '854', '950'],
19 ['39', '422', '449', '704', '825', '857', '895', '937', '954', '964'],
20 ['15',
21  '229',
22  '262',
23  '283',
24  '294',
25  '352',
26  '381',
27  '708',
28  '738',
29  '766',
30  '853',
31  '883',
32  '966',
33  '978'],
34 ['26', '104', '143', '320', '569', '620', '798'],
35 ['7',
36  '185',
37  '214',
38  '350',
39  '529',
40  '658',
41  '682',
42  '782',
43  '809',
44  '849',
45  '883',
46  '947',
```

```
47     '970',
48     '979'],
49     ['227', '390'],
50     ['71',
51      '192',
52      '208',
53      '272',
54      '279',
55      '280',
56      '300',
57      '333',
58      '496',
59      '529',
60      '530',
61      '597',
62      '618',
63      '674',
64      '675',
65      '720',
66      '855',
67      '914',
68      '932'],
69     ['183',
70      '193',
71      '217',
72      '256',
73      '276',
74      '277',
75      '374',
76      '474',
77      '483',
78      '496',
79      '512',
80      '529',
81      '626',
82      '653',
83      '706',
84      '878',
85      '939'],
86     ['161',
87      '175',
88      '177',
89      '424',
90      '490',
91      '571',
92      '597',
93      '623',
94      '766',
95      '795',
96      '853',
97      '910',
98      '960'],
99     ['125', '130', '327', '698', '699', '839'],
100    ['392', '461', '569', '801', '862'],
101    ['27', '78', '104', '177', '733', '775', '781', '845', '900', '921', '938'],
102    ['101',
103     '147',
104     '229',
105     '350',
106     '411',
107     '461',
108     '572',
109     '579',
110     '657',
111     '675',
112     '778',
113     '803',
114     '842',
115     '903'],
116    ['71',
117     '208',
118     '217',
119     '266',
120     '279',
121     '290',
122     '458',
123     '478',
124     '523',
```

```
125 '614',
126 '766',
127 '853',
128 '888',
129 '944',
130 '969'],
131 ['43',
132 '70',
133 '176',
134 '204',
135 '227',
136 '334',
137 '369',
138 '480',
139 '513',
140 '703',
141 '708',
142 '835',
143 '874',
144 '895'],
145 ['25', '52', '278', '730'],
146 ['151', '432', '504', '830', '890'],
147 ['71',
148 '73',
149 '118',
150 '274',
151 '310',
152 '327',
153 '388',
154 '419',
155 '449',
156 '469',
157 '484',
158 '706',
159 '722',
160 '795',
161 '810',
162 '844',
163 '846',
164 '918'],
165 ['130', '274', '432', '528', '967'],
166 ['188',
167 '307',
168 '326',
169 '381',
170 '403',
171 '523',
172 '526',
173 '722',
174 '774',
175 '788',
176 '789',
177 '834',
178 '950',
179 '975'],
180 ['89', '116', '198', '201', '333', '395', '653', '720', '846'],
181 ['70',
182 '171',
183 '227',
184 '289',
185 '462',
186 '538',
187 '541',
188 '623',
189 '674',
190 '701',
191 '805',
192 '946',
193 '964'],
194 ['143',
195 '192',
196 '317',
197 '471',
198 '487',
199 '631',
200 '638',
201 '640',
202 '678',
```

```
203 '735',
204 '780',
205 '865',
206 '888',
207 '935'],
208 ['17', '242', '471', '758', '763', '837', '956'],
209 ['52',
210 '145',
211 '161',
212 '283',
213 '375',
214 '385',
215 '676',
216 '721',
217 '731',
218 '790',
219 '792',
220 '885'],
221 ['182', '229', '276', '529'],
222 ['43', '522', '565', '617', '859'],
223 ['12',
224 '296',
225 '350',
226 '354',
227 '401',
228 '548',
229 '684',
230 '740',
231 '774',
232 '775',
233 '782',
234 '841',
235 '937'],
236 ['210',
237 '346',
238 '477',
239 '529',
240 '561',
241 '605',
242 '696',
243 '704',
244 '789',
245 '829',
246 '851',
247 '884',
248 '888'],
249 ['234', '296', '355', '460', '649', '684', '712', '735', '746', '829'],
250 ['177', '310', '600', '709', '970'],
251 ['28', '145', '157', '274', '346', '735', '742', '809'],
252 ['5',
253 '39',
254 '115',
255 '178',
256 '352',
257 '385',
258 '517',
259 '635',
260 '704',
261 '722',
262 '736',
263 '744',
264 '825',
265 '844',
266 '845',
267 '919'],
268 ['175',
269 '196',
270 '242',
271 '279',
272 '392',
273 '489',
274 '494',
275 '614',
276 '641',
277 '673',
278 '723',
279 '764',
280 '789',
```

```
281 '829',
282 '967'],
283 ['561', '758', '914', '919'],
284 ['118', '301', '362', '489', '522', '529', '591', '622', '930'],
285 ['31', '58', '59', '181', '329', '354', '417', '472', '573', '628', '651'],
286 ['39',
287 '111',
288 '154',
289 '164',
290 '168',
291 '213',
292 '272',
293 '392',
294 '436',
295 '489',
296 '580',
297 '628',
298 '632',
299 '832',
300 '871',
301 '988'],
302 ['368', '419', '517', '544', '740', '829', '914'],
303 ['72', '270', '295', '296', '368', '529', '541', '585', '937', '947'],
304 ['70',
305 '115',
306 '168',
307 '176',
308 '220',
309 '296',
310 '326',
311 '368',
312 '712',
313 '738',
314 '766',
315 '947',
316 '967',
317 '981'],
318 ['10', '183', '201', '334', '381', '419', '478', '569', '855', '874', '895'],
319 ['132', '172', '227', '277', '464', '538', '580', '795'],
320 ['21',
321 '32',
322 '54',
323 '136',
324 '192',
325 '213',
326 '239',
327 '274',
328 '348',
329 '411',
330 '487',
331 '638',
332 '753',
333 '764',
334 '888',
335 '935'],
336 ['26',
337 '72',
338 '100',
339 '172',
340 '194',
341 '276',
342 '460',
343 '500',
344 '871',
345 '874',
346 '885',
347 '888',
348 '960'],
349 ['48', '126', '175', '319', '494', '499', '614', '639', '641', '723', '765'],
350 ['70', '274', '296', '521', '639', '738', '855'],
351 ['112', '140', '285', '354', '387', '499', '511', '594', '614', '720'],
352 ['32', '72', '93', '354', '583', '606', '617', '937'],
353 ['71', '236', '419', '477', '489', '701', '706', '722', '736', '952'],
354 ['31', '90', '154', '198', '593', '722', '940', '941', '956'],
355 ['35', '122', '718', '723'],
356 ['1', '48', '236', '423', '516', '660', '744'],
357 ['6', '69', '183', '204', '415', '676', '797', '913', '980'],
358 ['217', '342', '577', '733', '805', '932'],
```

```
359 ['110',
360 '368',
361 '390',
362 '509',
363 '569',
364 '611',
365 '678',
366 '734',
367 '795',
368 '854',
369 '983',
370 '995'],
371 ['5', '155', '177', '343', '354', '430', '447', '487', '855'],
372 ['561', '591', '758', '919'],
373 ['376', '392', '496', '527', '533', '779', '789', '876', '919', '964'],
374 ['33',
375 '82',
376 '158',
377 '177',
378 '274',
379 '354',
380 '537',
381 '573',
382 '583',
383 '617',
384 '740',
385 '883'],
386 ['71',
387 '336',
388 '354',
389 '411',
390 '484',
391 '509',
392 '593',
393 '720',
394 '846',
395 '862',
396 '921',
397 '989'],
398 ['602', '704', '778', '884'],
399 ['93', '122', '161', '343', '390', '535', '538', '675', '874', '921', '932'],
400 ['101', '147', '657', '778', '903'],
401 ['21',
402 '52',
403 '97',
404 '147',
405 '183',
406 '368',
407 '381',
408 '424',
409 '574',
410 '676',
411 '793',
412 '857',
413 '947'],
414 ['172', '388', '464', '500', '529', '538', '598', '782', '945'],
415 ['447', '480', '529', '594', '708', '809', '841', '849', '874'],
416 ['127', '151', '161', '334', '427', '470', '494', '569'],
417 ['21', '32', '54', '136', '213', '239', '274', '348', '411', '753', '764'],
418 ['37',
419 '383',
420 '460',
421 '571',
422 '623',
423 '736',
424 '795',
425 '814',
426 '844',
427 '853',
428 '858',
429 '992'],
430 ['24', '55', '470', '522', '775', '940'],
431 ['95',
432 '143',
433 '159',
434 '347',
435 '460',
436 '481',
```

```
437 '517',
438 '682',
439 '697',
440 '722',
441 '774',
442 '883',
443 '897',
444 '919',
445 '966'],
446 ['196', '224', '279', '581', '674', '722', '814', '895', '946', '966'],
447 ['214', '354', '504', '956'],
448 ['17', '22', '234', '275', '276', '472', '489', '571', '715', '947'],
449 ['17',
450 '208',
451 '290',
452 '447',
453 '458',
454 '529',
455 '580',
456 '594',
457 '742',
458 '809',
459 '849',
460 '888',
461 '969'],
462 ['204', '334', '364', '579', '581', '699', '703', '895', '946', '966'],
463 ['51',
464 '78',
465 '136',
466 '177',
467 '259',
468 '283',
469 '581',
470 '631',
471 '651',
472 '775',
473 '781',
474 '964',
475 '966'],
476 ['147', '459', '580', '675', '701', '871', '921', '973'],
477 ['17',
478 '45',
479 '73',
480 '116',
481 '162',
482 '217',
483 '378',
484 '381',
485 '534',
486 '673',
487 '704',
488 '711',
489 '825',
490 '944',
491 '950',
492 '989'],
493 ['12', '39', '132', '181', '348', '562', '633', '672', '906', '912', '935'],
494 ['354', '470', '544', '966'],
495 ['44',
496 '72',
497 '96',
498 '117',
499 '183',
500 '204',
501 '315',
502 '509',
503 '533',
504 '541',
505 '569',
506 '576',
507 '594',
508 '642',
509 '825',
510 '879'],
511 ['12',
512 '18',
513 '205',
514 '234',
```

515 '242',  
516 '336',  
517 '373',  
518 '401',  
519 '460',  
520 '489',  
521 '716',  
522 '883',  
523 '918'],  
524 ['168', '427', '484', '874'],  
525 ['97',  
526 '120',  
527 '136',  
528 '147',  
529 '183',  
530 '210',  
531 '406',  
532 '538',  
533 '546',  
534 '568',  
535 '665',  
536 '789',  
537 '829',  
538 '878',  
539 '981'],  
540 ['82',  
541 '93',  
542 '228',  
543 '494',  
544 '511',  
545 '541',  
546 '574',  
547 '631',  
548 '713',  
549 '759',  
550 '785',  
551 '817',  
552 '963'],  
553 ['145', '234', '349', '419', '571', '623', '794', '795', '797', '853', '904'],  
554 ['8',  
555 '32',  
556 '72',  
557 '155',  
558 '193',  
559 '197',  
560 '348',  
561 '390',  
562 '401',  
563 '413',  
564 '423',  
565 '521',  
566 '577',  
567 '749',  
568 '823',  
569 '989'],  
570 ['94', '275', '390', '548', '605', '795', '982', '984'],  
571 ['274', '521', '639', '855'],  
572 ['37',  
573 '55',  
574 '71',  
575 '176',  
576 '201',  
577 '279',  
578 '449',  
579 '478',  
580 '515',  
581 '692',  
582 '694',  
583 '766',  
584 '853',  
585 '997'],  
586 ['423', '567', '824', '913'],  
587 ['2', '57', '183', '239', '577', '800', '812', '851', '937'],  
588 ['21',  
589 '41',  
590 '46',  
591 '57',  
592 '116',



593 '140',  
594 '174',  
595 '208',  
596 '414',  
597 '541',  
598 '577',  
599 '590',  
600 '606',  
601 '829',  
602 '935'],  
603 ['385', '460', '684', '775', '923'],  
604 ['348',  
605 '377',  
606 '459',  
607 '518',  
608 '571',  
609 '640',  
610 '672',  
611 '675',  
612 '701',  
613 '788',  
614 '865',  
615 '912',  
616 '921'],  
617 ['43', '160', '162', '456', '571', '734', '878', '960'],  
618 ['12', '150', '204', '236', '315', '419', '752', '852', '906', '966', '991'],  
619 ['17', '162', '217', '381', '711', '944'],  
620 ['172', '197', '464', '494', '538', '553', '623', '837'],  
621 ['274', '392', '461', '569', '801', '862'],  
622 ['905', '998'],  
623 ['33', '45', '71', '175', '217', '224', '239', '283', '346', '515', '910'],  
624 ['362', '387', '548', '573', '574', '709', '809', '811', '829', '854', '899'],  
625 ['320', '523', '620', '798', '905', '998'],  
626 ['48',  
627 '114',  
628 '175',  
629 '177',  
630 '275',  
631 '319',  
632 '352',  
633 '368',  
634 '527',  
635 '529',  
636 '595',  
637 '676',  
638 '710',  
639 '720',  
640 '782',  
641 '914'],  
642 ['120',  
643 '158',  
644 '192',  
645 '281',  
646 '354',  
647 '529',  
648 '583',  
649 '593',  
650 '617',  
651 '685',  
652 '813',  
653 '862',  
654 '867',  
655 '885',  
656 '895'],  
657 ['39',  
658 '43',  
659 '51',  
660 '69',  
661 '112',  
662 '170',  
663 '362',  
664 '438',  
665 '455',  
666 '563',  
667 '575',  
668 '620',  
669 '705',  
670 '738',

671 '752'],  
672 ['27', '58', '354', '357', '576', '752'],  
673 ['27',  
674 '58',  
675 '157',  
676 '354',  
677 '357',  
678 '470',  
679 '480',  
680 '659',  
681 '719',  
682 '752',  
683 '810',  
684 '960'],  
685 ['31',  
686 '48',  
687 '93',  
688 '126',  
689 '332',  
690 '361',  
691 '362',  
692 '421',  
693 '651',  
694 '812',  
695 '842',  
696 '878',  
697 '890'],  
698 ['33',  
699 '45',  
700 '116',  
701 '177',  
702 '274',  
703 '322',  
704 '534',  
705 '573',  
706 '673',  
707 '694',  
708 '740',  
709 '883',  
710 '897',  
711 '989'],  
712 ['97',  
713 '183',  
714 '379',  
715 '392',  
716 '438',  
717 '461',  
718 '569',  
719 '738',  
720 '775',  
721 '799',  
722 '801',  
723 '862',  
724 '918'],  
725 ['112',  
726 '162',  
727 '370',  
728 '568',  
729 '720',  
730 '797',  
731 '798',  
732 '805',  
733 '923',  
734 '926',  
735 '932',  
736 '947',  
737 '977'],  
738 ['71', '336', '354', '509', '989'],  
739 ['98',  
740 '113',  
741 '176',  
742 '236',  
743 '413',  
744 '419',  
745 '423',  
746 '516',  
747 '598',  
748 '701',

749 '722',  
750 '744',  
751 '788',  
752 '928'],  
753 ['220', '244', '790'],  
754 ['8', '71', '75', '108', '242', '438', '486', '684', '766', '958'],  
755 ['39', '101', '147', '229', '350', '778', '903', '970'],  
756 ['93', '381', '522', '597'],  
757 ['39', '438', '440', '778', '780', '825', '876', '879'],  
758 ['38', '71', '94', '252', '283', '401', '526', '784'],  
759 ['186',  
760 '205',  
761 '265',  
762 '326',  
763 '368',  
764 '403',  
765 '460',  
766 '526',  
767 '538',  
768 '722',  
769 '774',  
770 '895',  
771 '950'],  
772 ['187', '214', '296', '354', '368', '423', '548', '624'],  
773 ['116', '326', '343', '673', '686', '766', '943'],  
774 ['177', '350', '411', '572', '579', '797', '842', '992'],  
775 ['8',  
776 '36',  
777 '58',  
778 '274',  
779 '424',  
780 '460',  
781 '477',  
782 '651',  
783 '704',  
784 '884',  
785 '890',  
786 '903',  
787 '925',  
788 '944',  
789 '981'],  
790 ['71', '192', '196', '272', '300', '496', '935'],  
791 ['55', '108', '147', '201', '294', '332', '509', '540', '602'],  
792 ['21',  
793 '27',  
794 '346',  
795 '413',  
796 '435',  
797 '527',  
798 '605',  
799 '682',  
800 '793',  
801 '803',  
802 '830',  
803 '857',  
804 '940'],  
805 ['54',  
806 '192',  
807 '283',  
808 '375',  
809 '385',  
810 '438',  
811 '447',  
812 '598',  
813 '721',  
814 '731',  
815 '790',  
816 '885',  
817 '892'],  
818 ['48', '78', '147', '692', '738', '752', '964'],  
819 ['1',  
820 '32',  
821 '125',  
822 '283',  
823 '375',  
824 '385',  
825 '516',  
826 '721',

827 '731',  
828 '744',  
829 '790',  
830 '885'],  
831 ['118', '492', '500', '526', '803', '871', '874', '888'],  
832 ['276', '468', '612', '782', '789', '946', '960'],  
833 ['196', '406', '419', '631', '701', '704', '722', '735', '780', '884'],  
834 ['70', '280', '529', '663', '684', '758', '765', '819'],  
835 ['181', '387', '481', '581', '676', '789', '884', '914'],  
836 ['283', '368', '375', '385', '471', '721', '731', '790', '885'],  
837 ['5',  
838 '259',  
839 '262',  
840 '294',  
841 '352',  
842 '357',  
843 '403',  
844 '452',  
845 '708',  
846 '853',  
847 '882',  
848 '883',  
849 '886',  
850 '956',  
851 '978'],  
852 ['18', '57', '151', '266', '361', '381', '429', '471', '480', '988'],  
853 ['151', '266', '516', '523', '581', '733', '843', '883', '988', '998'],  
854 ['93',  
855 '97',  
856 '205',  
857 '265',  
858 '330',  
859 '470',  
860 '538',  
861 '620',  
862 '789',  
863 '874',  
864 '921',  
865 '932'],  
866 ['10', '129', '477', '487', '494', '578', '606', '651', '678', '928', '975'],  
867 ['147', '201', '296', '460', '477', '509', '540', '609', '903', '928', '944'],  
868 ['110', '111', '140', '197', '456', '510', '613', '788', '814', '988'],  
869 ['174', '236', '241', '692', '766', '950'],  
870 ['37', '68', '113', '179', '216', '377', '415', '738'],  
871 ['1', '48', '649', '660', '682', '716', '846', '860', '937'],  
872 ['120', '177', '185', '256', '357', '487', '675', '829'],  
873 ['32',  
874 '75',  
875 '78',  
876 '355',  
877 '427',  
878 '438',  
879 '461',  
880 '576',  
881 '638',  
882 '684',  
883 '752',  
884 '947'],  
885 ['118', '326', '343', '492', '526', '686', '766', '943'],  
886 ['33',  
887 '43',  
888 '68',  
889 '274',  
890 '373',  
891 '440',  
892 '472',  
893 '573',  
894 '666',  
895 '711',  
896 '740',  
897 '883'],  
898 ['97',  
899 '147',  
900 '183',  
901 '229',  
902 '276',  
903 '311',  
904 '318',

905 '348',  
906 '413',  
907 '500',  
908 '569',  
909 '788',  
910 '795',  
911 '912',  
912 '956'],  
913 ['346', '435', '527', '594', '785', '803'],  
914 ['4', '21', '145', '339', '563', '897'],  
915 ['48', '120', '145', '160', '304', '449', '580', '795', '887', '963'],  
916 ['6',  
917 '44',  
918 '45',  
919 '55',  
920 '140',  
921 '177',  
922 '265',  
923 '270',  
924 '283',  
925 '309',  
926 '472',  
927 '614',  
928 '682',  
929 '692',  
930 '804',  
931 '825',  
932 '832',  
933 '879',  
934 '983'],  
935 ['2', '33', '177', '193', '241', '496', '626', '897', '933'],  
936 ['32',  
937 '177',  
938 '276',  
939 '325',  
940 '470',  
941 '526',  
942 '579',  
943 '648',  
944 '745',  
945 '803',  
946 '874',  
947 '932',  
948 '934'],  
949 ['177',  
950 '239',  
951 '259',  
952 '489',  
953 '604',  
954 '784',  
955 '792',  
956 '804',  
957 '882',  
958 '937',  
959 '947',  
960 '956'],  
961 ['5', '28', '143', '283', '511', '832'],  
962 ['32',  
963 '115',  
964 '128',  
965 '154',  
966 '185',  
967 '234',  
968 '268',  
969 '377',  
970 '381',  
971 '541',  
972 '641',  
973 '697',  
974 '788',  
975 '812',  
976 '844'],  
977 ['75', '240', '262', '470', '597', '854', '899'],  
978 ['132', '217', '298', '318', '346', '561', '826', '888', '919'],  
979 ['110',  
980 '217',  
981 '394',  
982 '455',

983 '470',  
984 '487',  
985 '494',  
986 '510',  
987 '525',  
988 '534',  
989 '573',  
990 '707',  
991 '795',  
992 '867',  
993 '916',  
994 '995'],  
995 ['132', '158', '196', '217', '354', '394', '583', '617', '674', '885', '895'],  
996 ['204',  
997 '239',  
998 '283',  
999 '334',  
1000 '504',  
1001 '703',  
1002 '710',  
1003 '798',  
1004 '860',  
1005 '871',  
1006 '895',  
1007 '932',  
1008 '972'],  
1009 ['25',  
1010 '38',  
1011 '242',  
1012 '310',  
1013 '418',  
1014 '471',  
1015 '500',  
1016 '749',  
1017 '758',  
1018 '871',  
1019 '888',  
1020 '895'],  
1021 ['32',  
1022 '54',  
1023 '69',  
1024 '100',  
1025 '160',  
1026 '183',  
1027 '362',  
1028 '430',  
1029 '605',  
1030 '616',  
1031 '617',  
1032 '681',  
1033 '838',  
1034 '910'],  
1035 ['192', '281', '346', '453', '477', '526', '561', '605', '888'],  
1036 ['104', '175', '205', '368', '460', '538', '620', '752', '825'],  
1037 ['12',  
1038 '105',  
1039 '120',  
1040 '132',  
1041 '147',  
1042 '229',  
1043 '494',  
1044 '638',  
1045 '657',  
1046 '778',  
1047 '815',  
1048 '862',  
1049 '885',  
1050 '944'],  
1051 ['78', '177', '259', '775', '778', '781', '865', '920'],  
1052 ['7',  
1053 '45',  
1054 '68',  
1055 '117',  
1056 '122',  
1057 '161',  
1058 '178',  
1059 '343',  
1060 '347',

1061 '390',  
1062 '449',  
1063 '470',  
1064 '534',  
1065 '535',  
1066 '675',  
1067 '817',  
1068 '948'],  
1069 ['2',  
1070 '43',  
1071 '75',  
1072 '151',  
1073 '325',  
1074 '345',  
1075 '413',  
1076 '595',  
1077 '775',  
1078 '862',  
1079 '868',  
1080 '886'],  
1081 ['114', '308', '309', '368', '421', '658', '661', '665', '682', '750', '899'],  
1082 ['32',  
1083 '71',  
1084 '192',  
1085 '272',  
1086 '300',  
1087 '496',  
1088 '516',  
1089 '692',  
1090 '744',  
1091 '752',  
1092 '852',  
1093 '964'],  
1094 ['32',  
1095 '72',  
1096 '96',  
1097 '183',  
1098 '217',  
1099 '354',  
1100 '533',  
1101 '541',  
1102 '594',  
1103 '642',  
1104 '711',  
1105 '979'],  
1106 ['78',  
1107 '125',  
1108 '147',  
1109 '494',  
1110 '538',  
1111 '606',  
1112 '623',  
1113 '634',  
1114 '678',  
1115 '690',  
1116 '701',  
1117 '738',  
1118 '834',  
1119 '975'],  
1120 ['215', '349', '351', '464', '487', '577', '634', '693', '765', '826', '860'],  
1121 ['12',  
1122 '120',  
1123 '140',  
1124 '192',  
1125 '274',  
1126 '275',  
1127 '305',  
1128 '348',  
1129 '350',  
1130 '368',  
1131 '471',  
1132 '638',  
1133 '759',  
1134 '885'],  
1135 ['17', '204', '236', '240', '334', '541', '703', '895', '956'],  
1136 ['1', '21', '125', '413', '658', '765'],  
1137 ['17',  
1138 '171',

1139 '236',  
1140 '240',  
1141 '283',  
1142 '438',  
1143 '468',  
1144 '522',  
1145 '541',  
1146 '553',  
1147 '597',  
1148 '676',  
1149 '742',  
1150 '956'],  
1151 ['35',  
1152 '120',  
1153 '122',  
1154 '276',  
1155 '468',  
1156 '628',  
1157 '718',  
1158 '720',  
1159 '723',  
1160 '766',  
1161 '914',  
1162 '938',  
1163 '960',  
1164 '964'],  
1165 ['100', '122', '281', '343', '362', '368', '390', '535', '675', '681', '838'],  
1166 ['32',  
1167 '57',  
1168 '139',  
1169 '145',  
1170 '164',  
1171 '225',  
1172 '368',  
1173 '494',  
1174 '513',  
1175 '516',  
1176 '658',  
1177 '682',  
1178 '744',  
1179 '782',  
1180 '914',  
1181 '937'],  
1182 ['39', '204', '205', '210', '315', '350', '405', '800', '871', '970'],  
1183 ['411', '561', '857', '937', '954', '964'],  
1184 ['31',  
1185 '115',  
1186 '177',  
1187 '236',  
1188 '304',  
1189 '310',  
1190 '387',  
1191 '423',  
1192 '600',  
1193 '709',  
1194 '744',  
1195 '798',  
1196 '837',  
1197 '843',  
1198 '970'],  
1199 ['392', '408', '461', '569', '704', '801', '862', '900'],  
1200 ['376', '405', '694', '788'],  
1201 ['4',  
1202 '35',  
1203 '222',  
1204 '242',  
1205 '275',  
1206 '392',  
1207 '403',  
1208 '468',  
1209 '684',  
1210 '686',  
1211 '801',  
1212 '827',  
1213 '862'],  
1214 ['55', '57', '168', '268', '327', '652', '699', '793', '874', '885', '995'],  
1215 ['38',  
1216 '71',



1217 '72',  
1218 '111',  
1219 '181',  
1220 '210',  
1221 '252',  
1222 '283',  
1223 '349',  
1224 '354',  
1225 '419',  
1226 '421',  
1227 '778',  
1228 '888',  
1229 '913'],  
1230 ['177', '560', '653', '894', '911'],  
1231 ['39',  
1232 '154',  
1233 '168',  
1234 '242',  
1235 '279',  
1236 '280',  
1237 '354',  
1238 '392',  
1239 '484',  
1240 '489',  
1241 '597',  
1242 '618',  
1243 '711',  
1244 '722',  
1245 '764',  
1246 '932'],  
1247 ['280',  
1248 '381',  
1249 '405',  
1250 '427',  
1251 '477',  
1252 '518',  
1253 '571',  
1254 '630',  
1255 '672',  
1256 '871',  
1257 '883',  
1258 '897'],  
1259 ['167',  
1260 '216',  
1261 '387',  
1262 '409',  
1263 '458',  
1264 '485',  
1265 '531',  
1266 '672',  
1267 '688',  
1268 '692',  
1269 '798',  
1270 '935',  
1271 '949',  
1272 '998'],  
1273 ['43',  
1274 '75',  
1275 '129',  
1276 '140',  
1277 '163',  
1278 '279',  
1279 '395',  
1280 '438',  
1281 '440',  
1282 '472',  
1283 '496',  
1284 '651',  
1285 '707',  
1286 '829',  
1287 '854'],  
1288 ['43', '48', '126', '160', '162', '361', '593', '878'],  
1289 ['101', '147', '229', '569', '657', '778', '903'],  
1290 ['58', '132', '145', '354', '480', '672', '752', '795', '846', '935', '967'],  
1291 ['161',  
1292 '183',  
1293 '311',  
1294 '339',

1295 '368',  
1296 '414',  
1297 '460',  
1298 '472',  
1299 '516',  
1300 '523',  
1301 '536',  
1302 '573',  
1303 '580',  
1304 '733',  
1305 '998'],  
1306 ['90', '120', '309', '510', '620', '655', '793', '803', '804', '807', '970'],  
1307 ['196', '198', '204', '215', '252', '482', '487', '498', '529', '824', '913'],  
1308 ['78',  
1309 '177',  
1310 '193',  
1311 '236',  
1312 '259',  
1313 '276',  
1314 '279',  
1315 '455',  
1316 '483',  
1317 '529',  
1318 '598',  
1319 '752',  
1320 '775',  
1321 '782'],  
1322 ['132', '168', '298', '318', '403', '477', '591', '695', '874', '885'],  
1323 ['95', '280', '383', '419', '460', '622', '682', '690', '797', '838', '858'],  
1324 ['318', '413', '788', '956'],  
1325 ['8', '27', '69', '440', '494', '517', '746', '883', '893', '982'],  
1326 ['216', '376', '405', '694', '738'],  
1327 ['145', '686', '746', '788', '956', '973'],  
1328 ['32',  
1329 '112',  
1330 '285',  
1331 '387',  
1332 '499',  
1333 '511',  
1334 '594',  
1335 '614',  
1336 '631',  
1337 '720',  
1338 '735',  
1339 '780',  
1340 '920'],  
1341 ['6',  
1342 '32',  
1343 '158',  
1344 '164',  
1345 '279',  
1346 '327',  
1347 '405',  
1348 '472',  
1349 '484',  
1350 '581',  
1351 '783',  
1352 '829',  
1353 '960'],  
1354 ['70',  
1355 '259',  
1356 '335',  
1357 '350',  
1358 '385',  
1359 '398',  
1360 '509',  
1361 '523',  
1362 '684',  
1363 '778',  
1364 '844',  
1365 '884',  
1366 '937',  
1367 '967',  
1368 '970'],  
1369 ['26', '31', '283', '296', '326', '339', '349', '466', '486', '766', '982'],  
1370 ['112', '172', '185', '277', '464', '487', '538', '675', '713', '819'],  
1371 ['143', '443', '460', '481', '529', '601', '809', '841', '883', '919'],  
1372 ['10',

1373 '39',  
1374 '43',  
1375 '44',  
1376 '440',  
1377 '580',  
1378 '687',  
1379 '798',  
1380 '832',  
1381 '871',  
1382 '910',  
1383 '988'],  
1384 ['381', '812', '844'],  
1385 ['151',  
1386 '181',  
1387 '257',  
1388 '348',  
1389 '641',  
1390 '652',  
1391 '798',  
1392 '845',  
1393 '889',  
1394 '895',  
1395 '900',  
1396 '938'],  
1397 ['1', '32', '125', '206', '364', '524', '573', '742', '922'],  
1398 ['145',  
1399 '173',  
1400 '196',  
1401 '197',  
1402 '236',  
1403 '273',  
1404 '313',  
1405 '390',  
1406 '478',  
1407 '574',  
1408 '674',  
1409 '684',  
1410 '692',  
1411 '777',  
1412 '789',  
1413 '829',  
1414 '878',  
1415 '887'],  
1416 ['217', '394', '487', '510'],  
1417 ['70',  
1418 '138',  
1419 '203',  
1420 '307',  
1421 '308',  
1422 '334',  
1423 '423',  
1424 '486',  
1425 '684',  
1426 '765',  
1427 '800',  
1428 '819'],  
1429 ['89', '198', '300', '423', '442', '518', '521', '749', '823', '932'],  
1430 ['276',  
1431 '299',  
1432 '329',  
1433 '403',  
1434 '413',  
1435 '419',  
1436 '634',  
1437 '765',  
1438 '783',  
1439 '837',  
1440 '942',  
1441 '952'],  
1442 ['145', '354', '422', '487', '600', '885'],  
1443 ['205', '258', '614', '628', '629', '638', '658', '720', '766', '964'],  
1444 ['12', '158', '354', '401', '583', '597', '617', '663', '760', '912', '923'],  
1445 ['1', '66', '303', '314', '390', '470', '523', '823', '874', '884', '980'],  
1446 ['31',  
1447 '78',  
1448 '94',  
1449 '129',  
1450 '198',

1451 '313',  
1452 '390',  
1453 '394',  
1454 '480',  
1455 '515',  
1456 '644',  
1457 '692',  
1458 '738',  
1459 '829',  
1460 '922',  
1461 '926',  
1462 '981',  
1463 '992'],  
1464 ['169', '321', '523', '672', '788', '935'],  
1465 ['112', '140', '258', '270', '521', '804', '832', '914', '983'],  
1466 ['175', '183', '198', '239', '296', '510', '809', '840'],  
1467 ['31', '85', '125', '143', '145', '205', '381', '417', '706', '902'],  
1468 ['143', '348', '349', '460', '481', '778', '841', '862', '912', '919'],  
1469 ['78', '94', '126', '129', '198', '499', '644', '765', '922', '926'],  
1470 ['83', '110', '167', '427', '494', '573', '675', '707', '766', '867', '949'],  
1471 ['39',  
1472 '117',  
1473 '177',  
1474 '310',  
1475 '368',  
1476 '470',  
1477 '480',  
1478 '600',  
1479 '709',  
1480 '798',  
1481 '862',  
1482 '911'],  
1483 ['73', '115', '326', '469', '841', '948', '984'],  
1484 ['256', '313', '378', '390', '487', '510', '692', '829', '912', '978'],  
1485 ['11', '470', '534', '793', '995'],  
1486 ['40',  
1487 '45',  
1488 '71',  
1489 '120',  
1490 '175',  
1491 '196',  
1492 '224',  
1493 '239',  
1494 '593',  
1495 '674',  
1496 '814',  
1497 '895',  
1498 '910',  
1499 '966'],  
1500 ['32',  
1501 '41',  
1502 '105',  
1503 '112',  
1504 '116',  
1505 '145',  
1506 '208',  
1507 '403',  
1508 '494',  
1509 '541',  
1510 '590',  
1511 '593',  
1512 '606',  
1513 '676',  
1514 '694',  
1515 '815',  
1516 '862',  
1517 '944',  
1518 '963'],  
1519 ['171',  
1520 '192',  
1521 '450',  
1522 '487',  
1523 '631',  
1524 '638',  
1525 '735',  
1526 '760',  
1527 '780',  
1528 '886',

1529 '888',  
1530 '904',  
1531 '935'],  
1532 ['7',  
1533 '85',  
1534 '143',  
1535 '224',  
1536 '279',  
1537 '336',  
1538 '346',  
1539 '419',  
1540 '567',  
1541 '606',  
1542 '844',  
1543 '854',  
1544 '975'],  
1545 ['28', '395', '400', '419', '665', '793', '854', '895', '984'],  
1546 ['12', '350', '687', '782', '798', '841', '910'],  
1547 ['6', '70', '329', '368', '415', '417', '676', '692', '805', '860', '913'],  
1548 ['217', '394', '430', '487', '510', '579', '581', '966'],  
1549 ['8', '71', '75', '108', '242', '438', '486', '684', '766', '958'],  
1550 ['75', '112', '275', '279', '368', '428', '826', '829'],  
1551 ['12', '90', '227', '390', '675', '722', '886'],  
1552 ['27', '58', '354', '357', '480', '752'],  
1553 ['11', '192', '470', '534', '793', '935', '995'],  
1554 ['217', '345', '394', '401', '487', '510', '529', '571', '598', '782'],  
1555 ['95', '159', '249', '355', '517', '722', '883', '905', '966'],  
1556 ['28',  
1557 '39',  
1558 '214',  
1559 '239',  
1560 '521',  
1561 '580',  
1562 '627',  
1563 '658',  
1564 '705',  
1565 '832',  
1566 '871',  
1567 '979',  
1568 '988'],  
1569 ['177', '274', '521', '639', '855', '981'],  
1570 ['4', '35', '242', '392', '468', '472', '763', '801', '830', '862'],  
1571 ['263', '456', '550', '769', '886'],  
1572 ['279', '283', '307', '428', '574', '710', '826', '972'],  
1573 ['368', '522', '591', '692', '742'],  
1574 ['21',  
1575 '118',  
1576 '205',  
1577 '252',  
1578 '274',  
1579 '310',  
1580 '374',  
1581 '443',  
1582 '614',  
1583 '629',  
1584 '638',  
1585 '694',  
1586 '766',  
1587 '844',  
1588 '912',  
1589 '913'],  
1590 ['43', '120', '247', '272', '349', '562', '685', '804', '829', '948'],  
1591 ['138', '217', '280', '307', '486', '546', '571', '661', '672', '923', '947'],  
1592 ['52',  
1593 '54',  
1594 '322',  
1595 '541',  
1596 '571',  
1597 '598',  
1598 '600',  
1599 '623',  
1600 '633',  
1601 '795',  
1602 '853',  
1603 '897',  
1604 '992'],  
1605 ['388', '500', '945'],  
1606 ['33', '217', '249', '283', '346', '355', '515', '606', '883', '905', '950'],

1607 ['71', '210', '383', '413', '460', '522', '617', '631', '858', '885', '937'],  
1608 ['21',  
1609 '161',  
1610 '215',  
1611 '296',  
1612 '394',  
1613 '487',  
1614 '572',  
1615 '692',  
1616 '706',  
1617 '745',  
1618 '746',  
1619 '812',  
1620 '872'],  
1621 ['216',  
1622 '342',  
1623 '350',  
1624 '411',  
1625 '572',  
1626 '579',  
1627 '674',  
1628 '712',  
1629 '733',  
1630 '738',  
1631 '759',  
1632 '803',  
1633 '842',  
1634 '854',  
1635 '932'],  
1636 ['116', '381', '492', '523', '632', '706', '777', '778', '865', '893'],  
1637 ['117',  
1638 '132',  
1639 '256',  
1640 '298',  
1641 '318',  
1642 '378',  
1643 '487',  
1644 '510',  
1645 '578',  
1646 '628',  
1647 '651',  
1648 '849',  
1649 '887',  
1650 '912',  
1651 '978'],  
1652 ['75', '661', '720', '780', '849', '937', '964'],  
1653 ['154', '172', '205', '308', '381', '424', '464', '538', '812', '844'],  
1654 ['204', '579', '593', '611', '812', '832', '851'],  
1655 ['78',  
1656 '177',  
1657 '204',  
1658 '259',  
1659 '283',  
1660 '319',  
1661 '383',  
1662 '392',  
1663 '407',  
1664 '460',  
1665 '527',  
1666 '684',  
1667 '775',  
1668 '778',  
1669 '781',  
1670 '846',  
1671 '858',  
1672 '862'],  
1673 ['32', '33', '145', '217', '283', '346', '515', '593', '676', '694'],  
1674 ['95', '280', '419', '622', '682', '690', '797', '838'],  
1675 ['27', '440', '494', '517', '527', '647', '883', '893', '982'],  
1676 ['10',  
1677 '241',  
1678 '346',  
1679 '361',  
1680 '368',  
1681 '406',  
1682 '438',  
1683 '477',  
1684 '597',

1685 '897',  
1686 '935',  
1687 '944'],  
1688 ['72',  
1689 '80',  
1690 '120',  
1691 '239',  
1692 '278',  
1693 '354',  
1694 '520',  
1695 '522',  
1696 '707',  
1697 '775',  
1698 '822',  
1699 '832',  
1700 '844',  
1701 '970'],  
1702 ['46',  
1703 '80',  
1704 '120',  
1705 '147',  
1706 '158',  
1707 '201',  
1708 '354',  
1709 '490',  
1710 '509',  
1711 '540',  
1712 '571',  
1713 '583',  
1714 '617',  
1715 '623',  
1716 '795',  
1717 '853',  
1718 '906'],  
1719 ['12',  
1720 '71',  
1721 '151',  
1722 '440',  
1723 '482',  
1724 '579',  
1725 '706',  
1726 '736',  
1727 '752',  
1728 '778',  
1729 '846',  
1730 '972'],  
1731 ['5',  
1732 '27',  
1733 '58',  
1734 '354',  
1735 '357',  
1736 '403',  
1737 '452',  
1738 '480',  
1739 '653',  
1740 '708',  
1741 '752',  
1742 '886'],  
1743 ['21', '296', '423', '521', '529', '598', '749', '760', '782', '823'],  
1744 ['172',  
1745 '277',  
1746 '424',  
1747 '464',  
1748 '509',  
1749 '538',  
1750 '569',  
1751 '611',  
1752 '641',  
1753 '652',  
1754 '718',  
1755 '732',  
1756 '778',  
1757 '798',  
1758 '889',  
1759 '895',  
1760 '966'],  
1761 ['460', '477', '903', '944'],  
1762 ['205', '308', '424', '516', '523', '733', '998'],

1763 ['120', '136', '538', '546', '568', '665', '878', '981'],  
1764 ['68', '378', '405', '438', '449', '638', '674', '692', '839', '953'],  
1765 ['172', '684', '707', '778', '867', '943', '966'],  
1766 ['220', '448', '516', '557', '558', '641', '653', '670', '774', '913', '995'],  
1767 ['54',  
1768 '69',  
1769 '72',  
1770 '75',  
1771 '100',  
1772 '103',  
1773 '355',  
1774 '362',  
1775 '438',  
1776 '480',  
1777 '617',  
1778 '684',  
1779 '780',  
1780 '841',  
1781 '910',  
1782 '915',  
1783 '946'],  
1784 ['112', '215', '307', '521', '914', '966', '991'],  
1785 ['39',  
1786 '45',  
1787 '71',  
1788 '120',  
1789 '145',  
1790 '224',  
1791 '239',  
1792 '283',  
1793 '475',  
1794 '489',  
1795 '593',  
1796 '649',  
1797 '674',  
1798 '858',  
1799 '862',  
1800 '895',  
1801 '910'],  
1802 ['263', '279', '428', '597', '663', '826'],  
1803 ['16',  
1804 '201',  
1805 '358',  
1806 '385',  
1807 '450',  
1808 '460',  
1809 '684',  
1810 '710',  
1811 '763',  
1812 '867',  
1813 '923',  
1814 '944'],  
1815 ['43', '51', '583', '620', '687', '705', '722', '766', '784'],  
1816 ['33',  
1817 '35',  
1818 '197',  
1819 '217',  
1820 '283',  
1821 '335',  
1822 '346',  
1823 '509',  
1824 '515',  
1825 '537',  
1826 '878',  
1827 '884',  
1828 '937'],  
1829 ['25', '90', '120', '194', '304', '309', '368', '510', '569', '574', '793'],  
1830 ['39',  
1831 '227',  
1832 '277',  
1833 '348',  
1834 '450',  
1835 '468',  
1836 '489',  
1837 '632',  
1838 '661',  
1839 '692',  
1840 '704',



1841 '720',  
1842 '722',  
1843 '825',  
1844 '912',  
1845 '913'],  
1846 ['139', '151', '438', '440', '482', '526', '540', '608', '740', '790', '966'],  
1847 ['120',  
1848 '136',  
1849 '538',  
1850 '546',  
1851 '568',  
1852 '591',  
1853 '665',  
1854 '744',  
1855 '854',  
1856 '878',  
1857 '899',  
1858 '981'],  
1859 ['354', '486', '504', '572', '718', '914', '956'],  
1860 ['2',  
1861 '33',  
1862 '52',  
1863 '145',  
1864 '217',  
1865 '283',  
1866 '334',  
1867 '346',  
1868 '499',  
1869 '515',  
1870 '676',  
1871 '789',  
1872 '792',  
1873 '829'],  
1874 ['69', '90', '183', '198', '204', '285', '797', '854', '871', '940', '941'],  
1875 ['69', '130', '279', '362', '470', '534', '795', '914', '995'],  
1876 ['110', '138', '151', '351', '486', '605', '780', '935'],  
1877 ['116', '120', '276', '623', '652', '694'],  
1878 ['39', '145', '283', '475', '489', '649', '674'],  
1879 ['33', '45', '162', '197', '364', '430', '773', '883', '975'],  
1880 ['438', '738'],  
1881 ['43', '145', '160', '162', '571', '593', '686', '878', '973'],  
1882 ['6',  
1883 '28',  
1884 '31',  
1885 '32',  
1886 '130',  
1887 '132',  
1888 '274',  
1889 '349',  
1890 '432',  
1891 '472',  
1892 '528',  
1893 '661',  
1894 '818',  
1895 '966',  
1896 '967'],  
1897 ['6', '450', '507', '554', '569', '659', '718', '797'],  
1898 ['8',  
1899 '39',  
1900 '94',  
1901 '345',  
1902 '350',  
1903 '401',  
1904 '422',  
1905 '571',  
1906 '795',  
1907 '823',  
1908 '826',  
1909 '918',  
1910 '970'],  
1911 ['31', '122', '362', '437', '460', '509', '682', '890'],  
1912 ['8', '70', '90', '239', '354', '583'],  
1913 ['12',  
1914 '31',  
1915 '120',  
1916 '132',  
1917 '205',  
1918 '448',

1919	'494',
1920	'538',
1921	'638',
1922	'771',
1923	'780',
1924	'878',
1925	'887'],
1926	['100', '557', '687', '691', '934', '946'],
1927	['120', '136', '395', '538', '546', '568', '665', '854', '878', '895', '981'],
1928	['21', '35', '38', '57', '122', '362', '611', '718', '723', '918'],
1929	['104', '154', '168', '272', '436', '628', '649'],
1930	['139',
1931	'164',
1932	'183',
1933	'213',
1934	'225',
1935	'345',
1936	'366',
1937	'401',
1938	'494',
1939	'571',
1940	'674',
1941	'720',
1942	'782'],
1943	['35',
1944	'110',
1945	'249',
1946	'258',
1947	'265',
1948	'268',
1949	'350',
1950	'368',
1951	'411',
1952	'572',
1953	'579',
1954	'678',
1955	'733',
1956	'734',
1957	'763',
1958	'795',
1959	'803',
1960	'842',
1961	'950',
1962	'983',
1963	'995'],
1964	['72',
1965	'96',
1966	'183',
1967	'186',
1968	'265',
1969	'484',
1970	'496',
1971	'533',
1972	'541',
1973	'594',
1974	'626',
1975	'642',
1976	'895'],
1977	['120',
1978	'132',
1979	'183',
1980	'204',
1981	'280',
1982	'390',
1983	'746',
1984	'766',
1985	'797',
1986	'841',
1987	'874',
1988	'966'],
1989	['70',
1990	'177',
1991	'347',
1992	'419',
1993	'526',
1994	'579',
1995	'648',
1996	'665',

1997	'684',
1998	'745',
1999	'765',
2000	'793',
2001	'819',
2002	'914',
2003	'934',
2004	'984'],
2005	['197', '362', '561', '631', '752', '762', '838', '967'],
2006	['66', '144', '346', '373', '424', '494', '523', '815', '900'],
2007	['33',
2008	'217',
2009	'262',
2010	'265',
2011	'283',
2012	'294',
2013	'346',
2014	'352',
2015	'455',
2016	'708',
2017	'752',
2018	'853',
2019	'883',
2020	'978'],
2021	['129', '279', '496', '651', '707'],
2022	['2', '57', '234', '419', '577', '797', '812', '851', '904'],
2023	['256', '378', '487', '510', '912', '978'],
2024	['209',
2025	'267',
2026	'296',
2027	'326',
2028	'329',
2029	'403',
2030	'411',
2031	'440',
2032	'526',
2033	'722',
2034	'774',
2035	'803',
2036	'950'],
2037	['54', '210', '239', '406', '789', '800', '829', '854'],
2038	['82', '339', '348', '366', '750', '752', '776', '912'],
2039	['100', '368', '438', '512', '529', '735', '746', '813', '966'],
2040	['18', '39', '145', '371', '401', '419', '554', '769', '886'],
2041	['362', '392', '438', '567', '779', '867', '887'],
2042	['6', '236', '614', '658', '682', '785'],
2043	['12',
2044	'39',
2045	'343',
2046	'379',
2047	'412',
2048	'438',
2049	'580',
2050	'665',
2051	'682',
2052	'760',
2053	'832',
2054	'871',
2055	'886',
2056	'988'],
2057	['67', '571', '623', '692', '746', '795', '797', '853', '966'],
2058	['155', '177', '326', '541', '569', '694', '991'],
2059	['28',
2060	'75',
2061	'177',
2062	'310',
2063	'355',
2064	'400',
2065	'419',
2066	'438',
2067	'600',
2068	'665',
2069	'684',
2070	'689',
2071	'692',
2072	'709',
2073	'793',
2074	'970',

2075 '984'],  
2076 ['10', '130', '758', '766'],  
2077 ['32', '285', '385', '396', '561', '883', '894', '944', '947'],  
2078 ['234', '349', '351', '419', '464', '500', '634', '797', '904'],  
2079 ['52',  
2080 '90',  
2081 '120',  
2082 '309',  
2083 '373',  
2084 '469',  
2085 '510',  
2086 '529',  
2087 '593',  
2088 '620',  
2089 '653',  
2090 '661',  
2091 '774',  
2092 '793',  
2093 '846',  
2094 '918'],  
2095 ['53', '373', '611', '651', '829', '835'],  
2096 ['32',  
2097 '94',  
2098 '112',  
2099 '206',  
2100 '217',  
2101 '429',  
2102 '529',  
2103 '590',  
2104 '594',  
2105 '598',  
2106 '614',  
2107 '738',  
2108 '742'],  
2109 ['5',  
2110 '38',  
2111 '123',  
2112 '356',  
2113 '357',  
2114 '362',  
2115 '403',  
2116 '452',  
2117 '480',  
2118 '522',  
2119 '583',  
2120 '653',  
2121 '694',  
2122 '708',  
2123 '712',  
2124 '809',  
2125 '886'],  
2126 ['6', '90', '132', '198', '415', '580', '795', '913', '940', '941'],  
2127 ['259', '405', '477', '630', '882', '883', '937', '956'],  
2128 ['72',  
2129 '132',  
2130 '177',  
2131 '239',  
2132 '278',  
2133 '661',  
2134 '753',  
2135 '775',  
2136 '820',  
2137 '821',  
2138 '822',  
2139 '832',  
2140 '960',  
2141 '970'],  
2142 ['39', '579', '580', '736', '778', '832', '871', '972', '988'],  
2143 ['39', '43', '440'],  
2144 ['10', '145', '161', '220', '241', '361', '379', '406', '438', '597'],  
2145 ['57',  
2146 '117',  
2147 '159',  
2148 '576',  
2149 '614',  
2150 '658',  
2151 '771',  
2152 '814',

2153 '886',  
2154 '887',  
2155 '927',  
2156 '952'],  
2157 ['419', '450', '641', '797', '956'],  
2158 ['38', '181', '450', '620', '758', '811'],  
2159 ['130',  
2160 '274',  
2161 '342',  
2162 '362',  
2163 '392',  
2164 '460',  
2165 '600',  
2166 '658',  
2167 '733',  
2168 '744',  
2169 '820',  
2170 '932'],  
2171 ['114',  
2172 '308',  
2173 '309',  
2174 '368',  
2175 '579',  
2176 '593',  
2177 '658',  
2178 '661',  
2179 '665',  
2180 '682',  
2181 '812',  
2182 '832'],  
2183 ['132', '203', '204', '419', '581', '688', '732', '752', '949'],  
2184 ['35', '537'],  
2185 ['162', '173', '183', '204', '351', '507', '649', '771', '900'],  
2186 ['97', '707', '755', '918', '938'],  
2187 ['28', '112', '516', '523', '530', '561', '733', '998'],  
2188 ['23', '71', '140', '172', '280', '355', '395', '775', '895', '935'],  
2189 ['71',  
2190 '97',  
2191 '120',  
2192 '210',  
2193 '438',  
2194 '483',  
2195 '509',  
2196 '513',  
2197 '522',  
2198 '529',  
2199 '591',  
2200 '617',  
2201 '840',  
2202 '885',  
2203 '937'],  
2204 ['4', '112', '275', '591', '617', '661', '744'],  
2205 ['18', '180', '371', '385', '401', '460', '554', '684', '886', '918', '923'],  
2206 ['10', '159', '192', '620', '741', '784', '895', '952', '956', '972'],  
2207 ['25', '217', '304', '368', '529', '579', '581', '594', '738', '966'],  
2208 ['37', '68', '113', '179', '265', '377', '411', '415', '422', '449', '895'],  
2209 ['68', '378', '400', '449', '692', '758', '798', '839', '862', '866', '895'],  
2210 ['68', '449', '663', '694', '775', '839', '862'],  
2211 ['325', '354', '424', '480', '622', '692', '732', '736', '803', '893'],  
2212 ['32',  
2213 '57',  
2214 '75',  
2215 '192',  
2216 '206',  
2217 '281',  
2218 '325',  
2219 '368',  
2220 '595',  
2221 '742',  
2222 '775',  
2223 '897',  
2224 '937'],  
2225 ['5', '28', '143', '283', '511', '832'],  
2226 ['173', '202', '368', '684', '829'],  
2227 ['8', '71', '75', '108', '242', '438', '486', '684', '766', '958'],  
2228 ['55', '212', '362', '419', '682', '694', '722', '789', '829', '919'],  
2229 ['38',  
2230 '71',

2231 '120',  
2232 '252',  
2233 '283',  
2234 '526',  
2235 '628',  
2236 '720',  
2237 '766',  
2238 '914',  
2239 '938',  
2240 '964'],  
2241 ['5',  
2242 '28',  
2243 '93',  
2244 '143',  
2245 '283',  
2246 '322',  
2247 '511',  
2248 '694',  
2249 '832',  
2250 '874',  
2251 '897',  
2252 '921'],  
2253 ['100', '368', '438', '735', '966'],  
2254 ['12',  
2255 '72',  
2256 '96',  
2257 '97',  
2258 '183',  
2259 '193',  
2260 '438',  
2261 '533',  
2262 '541',  
2263 '642',  
2264 '682',  
2265 '986'],  
2266 ['10',  
2267 '130',  
2268 '161',  
2269 '326',  
2270 '368',  
2271 '460',  
2272 '477',  
2273 '580',  
2274 '634',  
2275 '676',  
2276 '903',  
2277 '944'],  
2278 ['7', '55', '108', '156', '185', '294', '682'],  
2279 ['598'],  
2280 ['27',  
2281 '58',  
2282 '78',  
2283 '183',  
2284 '205',  
2285 '354',  
2286 '357',  
2287 '424',  
2288 '480',  
2289 '676',  
2290 '752',  
2291 '909',  
2292 '980'],  
2293 ['23',  
2294 '25',  
2295 '71',  
2296 '217',  
2297 '236',  
2298 '240',  
2299 '280',  
2300 '336',  
2301 '354',  
2302 '395',  
2303 '509',  
2304 '517',  
2305 '593',  
2306 '614',  
2307 '744',  
2308 '895',

2309 '921',  
2310 '956',  
2311 '975',  
2312 '989'],  
2313 ['75',  
2314 '129',  
2315 '144',  
2316 '213',  
2317 '265',  
2318 '280',  
2319 '355',  
2320 '368',  
2321 '438',  
2322 '684',  
2323 '691',  
2324 '805',  
2325 '921'],  
2326 ['55', '174', '241', '618', '692', '766', '950'],  
2327 ['31', '205', '296', '362', '494', '598', '771', '825'],  
2328 ['66', '85', '175', '419', '581', '675', '752', '886', '952', '967', '984'],  
2329 ['12',  
2330 '38',  
2331 '39',  
2332 '82',  
2333 '283',  
2334 '285',  
2335 '470',  
2336 '598',  
2337 '789',  
2338 '793',  
2339 '829',  
2340 '922',  
2341 '992'],  
2342 ['242', '279', '392', '489', '764'],  
2343 ['72',  
2344 '80',  
2345 '270',  
2346 '295',  
2347 '354',  
2348 '373',  
2349 '529',  
2350 '541',  
2351 '585',  
2352 '755',  
2353 '871',  
2354 '874',  
2355 '888',  
2356 '937',  
2357 '947'],  
2358 ['45',  
2359 '85',  
2360 '111',  
2361 '116',  
2362 '249',  
2363 '378',  
2364 '529',  
2365 '534',  
2366 '598',  
2367 '653',  
2368 '673',  
2369 '706',  
2370 '782',  
2371 '989'],  
2372 ['440', '448', '538', '677', '744', '766', '780', '832', '868', '878', '887'],  
2373 ['117', '151', '432', '480', '504', '830', '890', '911'],  
2374 ['793', '956'],  
2375 ['120', '256', '829'],  
2376 ['95',  
2377 '116',  
2378 '154',  
2379 '217',  
2380 '236',  
2381 '352',  
2382 '354',  
2383 '517',  
2384 '657',  
2385 '661',  
2386 '722',

2387 '814',  
2388 '820',  
2389 '829',  
2390 '914',  
2391 '982'],  
2392 ['1',  
2393 '54',  
2394 '183',  
2395 '276',  
2396 '283',  
2397 '370',  
2398 '468',  
2399 '617',  
2400 '624',  
2401 '797',  
2402 '798',  
2403 '947',  
2404 '960',  
2405 '966',  
2406 '998'],  
2407 ['52',  
2408 '162',  
2409 '206',  
2410 '289',  
2411 '392',  
2412 '448',  
2413 '461',  
2414 '480',  
2415 '538',  
2416 '569',  
2417 '591',  
2418 '780',  
2419 '801',  
2420 '851',  
2421 '862',  
2422 '878',  
2423 '887'],  
2424 ['17', '346', '388', '558', '774'],  
2425 ['215', '487', '522', '688', '708', '838', '883', '978'],  
2426 ['46', '100', '145', '180', '327', '362', '469', '722', '810', '812'],  
2427 ['100', '362', '447', '461', '616', '681', '829', '838', '960'],  
2428 ['12', '205', '401', '489', '883'],  
2429 ['12', '15', '460', '550', '579', '632', '795'],  
2430 ['120',  
2431 '124',  
2432 '132',  
2433 '205',  
2434 '217',  
2435 '366',  
2436 '390',  
2437 '581',  
2438 '639',  
2439 '826',  
2440 '834',  
2441 '919',  
2442 '990'],  
2443 ['112', '131', '170', '279', '403', '581', '820', '963'],  
2444 ['70', '112', '280', '527', '684', '765', '819'],  
2445 ['51', '137', '522', '538', '614', '634', '809'],  
2446 ['12', '31', '48', '381', '489', '548', '595', '597', '721', '885'],  
2447 ['150', '162', '170', '204', '236', '401', '460', '803', '826', '852', '906'],  
2448 ['32', '193', '217', '394', '401', '487', '510', '577', '989'],  
2449 ['139',  
2450 '274',  
2451 '328',  
2452 '438',  
2453 '448',  
2454 '526',  
2455 '529',  
2456 '538',  
2457 '540',  
2458 '598',  
2459 '608',  
2460 '782',  
2461 '790',  
2462 '966'],  
2463 ['347',  
2464 '348',



2465 '402',  
2466 '577',  
2467 '581',  
2468 '631',  
2469 '651',  
2470 '722',  
2471 '804',  
2472 '912',  
2473 '964',  
2474 '966'],  
2475 ['98', '489', '494', '541', '631', '963'],  
2476 ['256',  
2477 '346',  
2478 '373',  
2479 '377',  
2480 '378',  
2481 '424',  
2482 '435',  
2483 '487',  
2484 '494',  
2485 '510',  
2486 '527',  
2487 '803',  
2488 '912',  
2489 '978'],  
2490 ['20', '73', '458', '531'],  
2491 ['329', '385', '403', '460', '684', '923', '952'],  
2492 ['48', '126', '361', '444', '568', '598', '694', '878'],  
2493 ['55', '296', '300', '322', '460', '675', '684'],  
2494 ['27',  
2495 '171',  
2496 '177',  
2497 '205',  
2498 '296',  
2499 '336',  
2500 '368',  
2501 '407',  
2502 '450',  
2503 '486',  
2504 '572',  
2505 '597',  
2506 '718',  
2507 '843',  
2508 '879',  
2509 '904',  
2510 '914'],  
2511 ['8', '143', '460', '481', '529', '598', '782', '919'],  
2512 ['8',  
2513 '71',  
2514 '75',  
2515 '108',  
2516 '174',  
2517 '241',  
2518 '242',  
2519 '438',  
2520 '486',  
2521 '684',  
2522 '692',  
2523 '766',  
2524 '950',  
2525 '958'],  
2526 ['32',  
2527 '39',  
2528 '203',  
2529 '321',  
2530 '368',  
2531 '401',  
2532 '460',  
2533 '470',  
2534 '516',  
2535 '744',  
2536 '792',  
2537 '820',  
2538 '918',  
2539 '985'],  
2540 ['183', '320', '620', '675', '766', '798', '831', '921'],  
2541 ['379', '529', '862', '899', '909'],  
2542 ['37',

2543 '39',  
2544 '68',  
2545 '113',  
2546 '179',  
2547 '348',  
2548 '377',  
2549 '411',  
2550 '415',  
2551 '529',  
2552 '598',  
2553 '704',  
2554 '782',  
2555 '825',  
2556 '984'],  
2557 ['112', '176', '285', '387', '499', '511', '594', '614', '618', '720', '810'],  
2558 ['4',  
2559 '112',  
2560 '120',  
2561 '170',  
2562 '214',  
2563 '266',  
2564 '275',  
2565 '280',  
2566 '324',  
2567 '415',  
2568 '527',  
2569 '661'],  
2570 ['93', '538', '716', '874', '921', '932'],  
2571 ['54', '210', '215', '487', '522', '688', '838', '854', '966'],  
2572 ['8', '12', '145', '161', '459', '674', '675', '686', '701', '883', '918'],  
2573 ['379', '438', '738', '746', '788', '956'],  
2574 ['37',  
2575 '73',  
2576 '75',  
2577 '258',  
2578 '334',  
2579 '474',  
2580 '577',  
2581 '600',  
2582 '638',  
2583 '706',  
2584 '919',  
2585 '989',  
2586 '992'],  
2587 ['296', '368', '447', '529', '594', '809', '829', '849', '982'],  
2588 ['217', '413', '522', '577', '805'],  
2589 ['158',  
2590 '236',  
2591 '308',  
2592 '331',  
2593 '354',  
2594 '455',  
2595 '558',  
2596 '583',  
2597 '617',  
2598 '684',  
2599 '752',  
2600 '766',  
2601 '914',  
2602 '982'],  
2603 ['12',  
2604 '75',  
2605 '308',  
2606 '314',  
2607 '373',  
2608 '487',  
2609 '490',  
2610 '548',  
2611 '660',  
2612 '674',  
2613 '686',  
2614 '718',  
2615 '775',  
2616 '788',  
2617 '886',  
2618 '906',  
2619 '918'],  
2620 ['8',

2621 '72',  
2622 '120',  
2623 '129',  
2624 '155',  
2625 '214',  
2626 '348',  
2627 '362',  
2628 '413',  
2629 '631',  
2630 '689',  
2631 '692',  
2632 '752',  
2633 '762',  
2634 '838'],  
2635 ['217', '366', '390', '639', '746', '878', '990'],  
2636 ['283', '550', '792', '841', '989'],  
2637 ['35',  
2638 '120',  
2639 '124',  
2640 '205',  
2641 '351',  
2642 '373',  
2643 '477',  
2644 '526',  
2645 '569',  
2646 '581',  
2647 '766',  
2648 '820',  
2649 '834',  
2650 '952'],  
2651 ['78', '147', '538', '634', '738'],  
2652 ['46',  
2653 '71',  
2654 '112',  
2655 '130',  
2656 '274',  
2657 '336',  
2658 '354',  
2659 '509',  
2660 '521',  
2661 '561',  
2662 '593',  
2663 '844',  
2664 '921',  
2665 '989'],  
2666 ['123',  
2667 '145',  
2668 '155',  
2669 '295',  
2670 '419',  
2671 '509',  
2672 '522',  
2673 '525',  
2674 '571',  
2675 '579',  
2676 '712',  
2677 '844'],  
2678 ['97', '120', '438', '483', '509', '513', '840'],  
2679 ['32',  
2680 '64',  
2681 '151',  
2682 '188',  
2683 '217',  
2684 '266',  
2685 '432',  
2686 '504',  
2687 '550',  
2688 '590',  
2689 '598',  
2690 '795',  
2691 '798',  
2692 '830',  
2693 '890',  
2694 '927'],  
2695 ['8', '349', '459', '675', '701', '794', '829', '867', '888', '921'],  
2696 ['57',  
2697 '120',  
2698 '151',

2699 '241',  
2700 '332',  
2701 '350',  
2702 '354',  
2703 '548',  
2704 '567',  
2705 '581',  
2706 '614',  
2707 '658',  
2708 '738',  
2709 '814',  
2710 '835',  
2711 '893'],  
2712 ['117',  
2713 '423',  
2714 '480',  
2715 '510',  
2716 '521',  
2717 '684',  
2718 '715',  
2719 '809',  
2720 '823',  
2721 '854',  
2722 '899',  
2723 '911',  
2724 '936',  
2725 '961'],  
2726 ['173', '203', '204', '333', '348', '530', '912'],  
2727 ['39',  
2728 '90',  
2729 '170',  
2730 '252',  
2731 '318',  
2732 '413',  
2733 '675',  
2734 '704',  
2735 '788',  
2736 '825',  
2737 '886',  
2738 '912',  
2739 '913',  
2740 '956'],  
2741 ['140', '258', '832', '983'],  
2742 ['55', '318', '413', '618', '788', '956'],  
2743 ['5', '31', '45', '55', '125', '161', '177', '309', '614', '692', '805'],  
2744 ['18', '37', '450', '456', '797', '826', '937'],  
2745 ['12', '115', '157', '227', '276', '370', '427', '608', '789', '992'],  
2746 ['27',  
2747 '440',  
2748 '494',  
2749 '517',  
2750 '561',  
2751 '647',  
2752 '758',  
2753 '883',  
2754 '893',  
2755 '914',  
2756 '919',  
2757 '982'],  
2758 ['31', '103', '125', '343', '490', '653', '794', '906'],  
2759 ['162', '170', '283', '401', '460', '710', '972'],  
2760 ['58',  
2761 '75',  
2762 '112',  
2763 '263',  
2764 '275',  
2765 '392',  
2766 '489',  
2767 '498',  
2768 '597',  
2769 '632',  
2770 '663',  
2771 '762',  
2772 '790',  
2773 '795'],  
2774 ['8',  
2775 '52',  
2776 '515',

2777 '583',  
2778 '638',  
2779 '689',  
2780 '730',  
2781 '736',  
2782 '738',  
2783 '746',  
2784 '799',  
2785 '963'],  
2786 ['66', '144', '161', '368', '439', '573', '580', '631', '735', '780', '815'],  
2787 ['32',  
2788 '72',  
2789 '93',  
2790 '350',  
2791 '527',  
2792 '541',  
2793 '561',  
2794 '600',  
2795 '606',  
2796 '744',  
2797 '831',  
2798 '895',  
2799 '937'],  
2800 ['73',  
2801 '75',  
2802 '278',  
2803 '295',  
2804 '355',  
2805 '368',  
2806 '391',  
2807 '413',  
2808 '438',  
2809 '480',  
2810 '487',  
2811 '522',  
2812 '534',  
2813 '682',  
2814 '684',  
2815 '758',  
2816 '829',  
2817 '940'],  
2818 ['11', '93', '97', '789', '793', '995'],  
2819 ['17', '38', '71', '132', '236', '240', '252', '283', '526', '956'],  
2820 ['157', '470', '659', '719', '810', '960'],  
2821 ['39', '71', '95', '214', '368', '453', '470', '526', '653', '658', '970'],  
2822 ['93', '494', '682', '785', '950'],  
2823 ['72',  
2824 '96',  
2825 '183',  
2826 '256',  
2827 '378',  
2828 '487',  
2829 '510',  
2830 '533',  
2831 '541',  
2832 '594',  
2833 '642',  
2834 '912',  
2835 '978'],  
2836 ['101', '140', '217', '229', '657', '778', '903'],  
2837 ['154', '328', '395', '789', '854', '862', '895', '899', '906'],  
2838 ['408', '460', '477', '509', '569', '642', '903', '937', '944'],  
2839 ['4', '112', '275', '413', '661'],  
2840 ['71', '115', '162', '181', '403', '522', '597', '617', '782', '885', '937'],  
2841 ['39',  
2842 '140',  
2843 '196',  
2844 '198',  
2845 '217',  
2846 '252',  
2847 '368',  
2848 '470',  
2849 '498',  
2850 '512',  
2851 '529',  
2852 '597',  
2853 '653',  
2854 '913',

2855 '982'],  
2856 ['177',  
2857 '276',  
2858 '299',  
2859 '413',  
2860 '579',  
2861 '634',  
2862 '648',  
2863 '745',  
2864 '783',  
2865 '837',  
2866 '934',  
2867 '942'],  
2868 ['19', '70', '490', '684', '765', '810', '819', '885', '906'],  
2869 ['217', '346', '419', '561', '701', '722', '874', '888'],  
2870 ['27', '440', '494', '517', '647', '883', '893', '982'],  
2871 ['10',  
2872 '38',  
2873 '39',  
2874 '43',  
2875 '181',  
2876 '440',  
2877 '450',  
2878 '509',  
2879 '569',  
2880 '620',  
2881 '758',  
2882 '763',  
2883 '769',  
2884 '830'],  
2885 ['263', '456', '550', '672', '769', '886', '935'],  
2886 ['158', '164', '327', '405', '484', '529', '783', '813'],  
2887 ['263', '456', '550', '575', '673', '769', '886'],  
2888 ['27',  
2889 '196',  
2890 '198',  
2891 '252',  
2892 '440',  
2893 '498',  
2894 '517',  
2895 '529',  
2896 '647',  
2897 '661',  
2898 '720',  
2899 '780',  
2900 '883',  
2901 '893',  
2902 '913',  
2903 '982'],  
2904 ['54', '604', '784', '820', '888', '947'],  
2905 ['35', '122', '205', '368', '460', '538', '723'],  
2906 ['104', '332', '381', '598', '614'],  
2907 ['214', '354', '504', '956'],  
2908 ['10',  
2909 '151',  
2910 '163',  
2911 '171',  
2912 '332',  
2913 '516',  
2914 '522',  
2915 '523',  
2916 '548',  
2917 '676',  
2918 '733',  
2919 '738',  
2920 '742',  
2921 '835',  
2922 '854',  
2923 '998'],  
2924 ['132',  
2925 '196',  
2926 '217',  
2927 '394',  
2928 '539',  
2929 '628',  
2930 '674',  
2931 '689',  
2932 '692',

2933 '812',  
2934 '829',  
2935 '895'],  
2936 ['17', '105', '275', '332', '362', '469', '571', '991'],  
2937 ['33', '57', '205', '308', '424', '525', '661', '846', '916'],  
2938 ['48',  
2939 '52',  
2940 '326',  
2941 '376',  
2942 '403',  
2943 '405',  
2944 '526',  
2945 '614',  
2946 '694',  
2947 '722',  
2948 '774',  
2949 '788',  
2950 '950'],  
2951 ['20',  
2952 '21',  
2953 '111',  
2954 '215',  
2955 '390',  
2956 '395',  
2957 '472',  
2958 '487',  
2959 '522',  
2960 '569',  
2961 '575',  
2962 '688',  
2963 '769',  
2964 '838'],  
2965 ['214', '244', '658', '782', '790', '947', '979'],  
2966 ['71', '141', '172', '349', '373', '407', '529', '639', '684', '778', '902'],  
2967 ['396', '438', '470', '548', '988'],  
2968 ['39', '53', '236', '350', '408', '571', '673', '766', '914', '982'],  
2969 ['157', '470', '510', '659', '719', '810', '843', '960', '981'],  
2970 ['110', '151', '276', '351', '500', '605', '780', '793', '935', '956'],  
2971 ['72',  
2972 '85',  
2973 '129',  
2974 '239',  
2975 '278',  
2976 '307',  
2977 '351',  
2978 '465',  
2979 '479',  
2980 '520',  
2981 '775',  
2982 '822',  
2983 '832',  
2984 '854',  
2985 '970'],  
2986 ['48',  
2987 '147',  
2988 '229',  
2989 '419',  
2990 '517',  
2991 '530',  
2992 '548',  
2993 '573',  
2994 '635',  
2995 '657',  
2996 '744',  
2997 '745',  
2998 '778',  
2999 '809',  
3000 '811',  
3001 '829',  
3002 '844',  
3003 '845',  
3004 '903'],  
3005 ['32', '217', '275', '522', '577', '605', '710', '805', '825', '876', '879'],  
3006 ['310', '709', '752', '803', '956', '970'],  
3007 ['37', '54', '68', '400', '758', '866', '895'],  
3008 ['55', '140', '254', '258', '270', '775', '804', '832', '910', '945', '983'],  
3009 ['28', '239', '368', '489', '521', '627', '653', '705', '744', '833'],  
3010 ['145', '151', '161', '210', '440', '477', '482', '740'],

3011 ['145', '354', '422', '487', '600', '885'],  
3012 ['39', '114', '116', '201', '230', '333', '653', '720', '844', '846', '928'],  
3013 ['10', '697', '789', '829'],  
3014 ['28', '400', '419', '665', '744', '793', '868', '984'],  
3015 ['142',  
3016 '346',  
3017 '392',  
3018 '435',  
3019 '438',  
3020 '461',  
3021 '527',  
3022 '569',  
3023 '634',  
3024 '801',  
3025 '803',  
3026 '830',  
3027 '862',  
3028 '940'],  
3029 ['141', '290', '477', '516', '523', '684', '733', '998'],  
3030 ['33', '196', '203', '217', '283', '346', '513', '515'],  
3031 ['151', '173', '205', '308', '320', '424', '814', '921'],  
3032 ['140', '217', '546', '661', '923', '947'],  
3033 ['39', '579', '580', '581', '832', '871', '966', '988'],  
3034 ['27',  
3035 '216',  
3036 '240',  
3037 '362',  
3038 '387',  
3039 '401',  
3040 '409',  
3041 '438',  
3042 '485',  
3043 '692',  
3044 '789',  
3045 '798',  
3046 '890',  
3047 '998'],  
3048 ['31', '207', '294', '715', '793'],  
3049 ['127',  
3050 '151',  
3051 '161',  
3052 '280',  
3053 '334',  
3054 '427',  
3055 '470',  
3056 '494',  
3057 '569',  
3058 '578',  
3059 '598',  
3060 '746',  
3061 '774',  
3062 '788',  
3063 '858',  
3064 '905'],  
3065 ['249',  
3066 '355',  
3067 '392',  
3068 '461',  
3069 '510',  
3070 '539',  
3071 '569',  
3072 '656',  
3073 '801',  
3074 '829',  
3075 '843',  
3076 '862',  
3077 '883',  
3078 '885',  
3079 '905',  
3080 '981'],  
3081 ['180', '256', '704', '884'],  
3082 ['38', '558', '914'],  
3083 ['82', '339', '366', '750', '752', '776'],  
3084 ['132', '296', '459', '598', '675', '688', '701'],  
3085 ['0',  
3086 '45',  
3087 '66',  
3088 '68',



3089 '85',  
3090 '117',  
3091 '173',  
3092 '285',  
3093 '675',  
3094 '710',  
3095 '731',  
3096 '817',  
3097 '886',  
3098 '947',  
3099 '950',  
3100 '967'],  
3101 ['151',  
3102 '167',  
3103 '210',  
3104 '266',  
3105 '316',  
3106 '437',  
3107 '440',  
3108 '477',  
3109 '482',  
3110 '509',  
3111 '623',  
3112 '740',  
3113 '831',  
3114 '890',  
3115 '949'],  
3116 ['48', '126', '361', '878'],  
3117 ['93', '538', '874', '921', '932'],  
3118 ['12',  
3119 '73',  
3120 '177',  
3121 '187',  
3122 '256',  
3123 '274',  
3124 '278',  
3125 '310',  
3126 '322',  
3127 '368',  
3128 '449',  
3129 '682',  
3130 '694',  
3131 '784',  
3132 '897',  
3133 '982',  
3134 '984'],  
3135 ['172', '778', '966'],  
3136 ['110',  
3137 '151',  
3138 '207',  
3139 '275',  
3140 '296',  
3141 '322',  
3142 '343',  
3143 '368',  
3144 '620',  
3145 '798',  
3146 '803',  
3147 '826',  
3148 '829'],  
3149 ['209', '321', '322', '563', '694', '757', '839', '897', '970', '978'],  
3150 ['24', '38', '168', '349', '387', '692', '810', '915'],  
3151 ['71', '100', '336', '354', '424', '478', '509', '593', '921', '989'],  
3152 ['104', '111', '177', '332', '381', '490', '614'],  
3153 ['208', '290', '405', '458', '571', '648', '732', '798', '888', '969'],  
3154 ['1', '8', '48', '118', '349', '492', '526', '578', '881'],  
3155 ['69',  
3156 '173',  
3157 '177',  
3158 '187',  
3159 '285',  
3160 '320',  
3161 '450',  
3162 '499',  
3163 '560',  
3164 '594',  
3165 '653',  
3166 '894',

3167 '911',  
3168 '921',  
3169 '980',  
3170 '984'],  
3171 ['57',  
3172 '129',  
3173 '145',  
3174 '160',  
3175 '162',  
3176 '368',  
3177 '374',  
3178 '494',  
3179 '593',  
3180 '658',  
3181 '682',  
3182 '763',  
3183 '937'],  
3184 ['155', '177', '430', '447', '509', '569', '730', '893'],  
3185 ['71', '187', '277', '326', '629', '793', '914', '984'],  
3186 ['31', '59', '354', '472'],  
3187 ['100', '349', '364', '443', '487', '524', '541', '573', '922'],  
3188 ['28', '349', '854'],  
3189 ['372', '510', '682', '802', '844', '922'],  
3190 ['154', '512', '529', '653', '789', '862', '899', '906'],  
3191 ['90',  
3192 '115',  
3193 '116',  
3194 '130',  
3195 '153',  
3196 '231',  
3197 '320',  
3198 '322',  
3199 '395',  
3200 '673',  
3201 '695',  
3202 '919'],  
3203 ['140', '319', '539', '605', '769', '812', '829'],  
3204 ['70', '98', '489', '661', '720', '765', '780', '819'],  
3205 ['45',  
3206 '108',  
3207 '155',  
3208 '378',  
3209 '385',  
3210 '494',  
3211 '541',  
3212 '583',  
3213 '631',  
3214 '693',  
3215 '803',  
3216 '860',  
3217 '921',  
3218 '963'],  
3219 ['54',  
3220 '71',  
3221 '126',  
3222 '319',  
3223 '499',  
3224 '578',  
3225 '639',  
3226 '651',  
3227 '706',  
3228 '765',  
3229 '782',  
3230 '952',  
3231 '964',  
3232 '982'],  
3233 ['276', '299', '413', '634', '783', '942'],  
3234 ['12',  
3235 '39',  
3236 '120',  
3237 '132',  
3238 '145',  
3239 '192',  
3240 '419',  
3241 '638',  
3242 '661',  
3243 '720',  
3244 '769',

3245 '780',  
3246 '885',  
3247 '935'],  
3248 ['52',  
3249 '279',  
3250 '414',  
3251 '428',  
3252 '470',  
3253 '534',  
3254 '597',  
3255 '598',  
3256 '795',  
3257 '826',  
3258 '914',  
3259 '995'],  
3260 ['43', '71', '336', '354', '440', '472', '509', '593', '921', '989'],  
3261 ['27',  
3262 '52',  
3263 '177',  
3264 '217',  
3265 '346',  
3266 '469',  
3267 '561',  
3268 '593',  
3269 '597',  
3270 '653',  
3271 '661',  
3272 '774',  
3273 '879',  
3274 '888',  
3275 '918'],  
3276 ['350', '371', '401', '414', '487', '511', '554', '832', '857', '886', '918'],  
3277 ['2', '37', '43', '151', '862', '868', '921'],  
3278 ['438', '778', '780', '782', '854'],  
3279 ['177', '310', '600', '709', '970'],  
3280 ['33', '45', '162', '364', '773', '883'],  
3281 ['12',  
3282 '39',  
3283 '116',  
3284 '132',  
3285 '181',  
3286 '279',  
3287 '316',  
3288 '345',  
3289 '357',  
3290 '562',  
3291 '580',  
3292 '633',  
3293 '826',  
3294 '854',  
3295 '906',  
3296 '919'],  
3297 ['173',  
3298 '196',  
3299 '217',  
3300 '346',  
3301 '516',  
3302 '523',  
3303 '561',  
3304 '596',  
3305 '649',  
3306 '733',  
3307 '789',  
3308 '809',  
3309 '888',  
3310 '919',  
3311 '998'],  
3312 ['120', '348', '472', '522', '707', '844', '912'],  
3313 ['71', '279', '348', '478', '720', '735', '766', '843', '853'],  
3314 ['207', '217', '346', '561', '789', '888', '950'],  
3315 ['32', '72', '89', '93', '196', '198', '350', '518', '606', '932', '937'],  
3316 ['78', '279', '349', '351', '428', '464', '576', '634', '826', '841'],  
3317 ['95'],  
3318 ['78', '94', '129', '198', '644', '922', '926'],  
3319 ['438', '814', '981'],  
3320 ['129', '145', '229', '311', '467', '470', '534', '738', '795', '812', '995'],  
3321 ['150',  
3322 '204',

3323 '236',  
3324 '326',  
3325 '403',  
3326 '493',  
3327 '526',  
3328 '722',  
3329 '774',  
3330 '826',  
3331 '852',  
3332 '854',  
3333 '906',  
3334 '950'],  
3335 ['26', '100', '172', '194', '509', '563', '569', '611', '673'],  
3336 ['1', '10', '33', '550', '841', '989'],  
3337 ['114',  
3338 '308',  
3339 '309',  
3340 '368',  
3341 '571',  
3342 '623',  
3343 '658',  
3344 '661',  
3345 '665',  
3346 '682',  
3347 '720',  
3348 '780',  
3349 '853'],  
3350 ['22', '539', '618', '639', '689', '812', '829', '967'],  
3351 ['105', '136', '193', '494', '585', '815', '843', '862', '925', '944', '948'],  
3352 ['73',  
3353 '171',  
3354 '406',  
3355 '523',  
3356 '571',  
3357 '600',  
3358 '603',  
3359 '684',  
3360 '789',  
3361 '936',  
3362 '941',  
3363 '961'],  
3364 ['217', '394', '487', '494', '510', '606', '678', '975'],  
3365 ['78', '130', '183', '326', '538', '634', '639', '676', '909', '919', '937'],  
3366 ['39', '54', '86', '309', '494', '640', '683', '778', '780', '820', '964'],  
3367 ['35', '140', '164', '217', '239', '537', '804', '919'],  
3368 ['150', '204', '236', '798', '826', '852', '862', '906'],  
3369 ['0',  
3370 '53',  
3371 '183',  
3372 '368',  
3373 '401',  
3374 '419',  
3375 '428',  
3376 '581',  
3377 '684',  
3378 '752',  
3379 '766',  
3380 '831'],  
3381 ['12',  
3382 '116',  
3383 '153',  
3384 '266',  
3385 '354',  
3386 '381',  
3387 '401',  
3388 '419',  
3389 '460',  
3390 '523',  
3391 '673',  
3392 '686',  
3393 '766',  
3394 '777'],  
3395 ['132',  
3396 '145',  
3397 '178',  
3398 '196',  
3399 '347',  
3400 '408',

3401 '424',  
3402 '509',  
3403 '534',  
3404 '569',  
3405 '574',  
3406 '642',  
3407 '674',  
3408 '937'],  
3409 ['31',  
3410 '75',  
3411 '208',  
3412 '290',  
3413 '325',  
3414 '362',  
3415 '458',  
3416 '595',  
3417 '775',  
3418 '788',  
3419 '888',  
3420 '969'],  
3421 ['201', '381', '569', '617', '624', '798', '855', '874', '895'],  
3422 ['83', '167', '207', '294', '392', '512', '675', '724', '766', '949'],  
3423 ['52', '177', '529', '567', '598', '611'],  
3424 ['167', '280', '578', '598', '699', '774', '905', '946'],  
3425 ['55', '108', '156', '294'],  
3426 ['182', '229', '276', '417', '529', '650', '813'],  
3427 ['70',  
3428 '75',  
3429 '120',  
3430 '246',  
3431 '325',  
3432 '368',  
3433 '595',  
3434 '623',  
3435 '649',  
3436 '775',  
3437 '864',  
3438 '899'],  
3439 ['93',  
3440 '192',  
3441 '395',  
3442 '405',  
3443 '438',  
3444 '638',  
3445 '674',  
3446 '785',  
3447 '854',  
3448 '895',  
3449 '935',  
3450 '953'],  
3451 ['38',  
3452 '71',  
3453 '98',  
3454 '252',  
3455 '283',  
3456 '364',  
3457 '438',  
3458 '489',  
3459 '524',  
3460 '526',  
3461 '573',  
3462 '778',  
3463 '922'],  
3464 ['27',  
3465 '58',  
3466 '69',  
3467 '112',  
3468 '354',  
3469 '357',  
3470 '362',  
3471 '480',  
3472 '528',  
3473 '563',  
3474 '732',  
3475 '752'],  
3476 ['207', '285', '538', '539', '812', '829', '874', '921', '932', '950'],  
3477 ['17',  
3478 '120',

3479 '154',  
3480 '162',  
3481 '229',  
3482 '328',  
3483 '381',  
3484 '711',  
3485 '712',  
3486 '789',  
3487 '862',  
3488 '883',  
3489 '899',  
3490 '906',  
3491 '944'],  
3492 ['8',  
3493 '161',  
3494 '183',  
3495 '204',  
3496 '220',  
3497 '422',  
3498 '449',  
3499 '516',  
3500 '529',  
3501 '653',  
3502 '797',  
3503 '895',  
3504 '995'],  
3505 ['8', '12', '36', '48', '274', '381', '424', '597', '925'],  
3506 ['10', '129', '192', '274', '279', '350', '496', '651', '707', '711', '759'],  
3507 ['73',  
3508 '111',  
3509 '116',  
3510 '129',  
3511 '153',  
3512 '334',  
3513 '374',  
3514 '474',  
3515 '638',  
3516 '673',  
3517 '763',  
3518 '989'],  
3519 ['158',  
3520 '234',  
3521 '354',  
3522 '372',  
3523 '448',  
3524 '510',  
3525 '583',  
3526 '617',  
3527 '682',  
3528 '780',  
3529 '802',  
3530 '844',  
3531 '878',  
3532 '887',  
3533 '922'],  
3534 ['171', '240', '598', '671', '982', '991'],  
3535 ['438', '548', '694', '778', '780', '844'],  
3536 ['217', '334', '394', '487', '510', '538', '645', '694', '763', '941'],  
3537 ['110',  
3538 '151',  
3539 '283',  
3540 '351',  
3541 '392',  
3542 '407',  
3543 '527',  
3544 '605',  
3545 '684',  
3546 '778',  
3547 '780',  
3548 '846',  
3549 '862',  
3550 '906',  
3551 '935'],  
3552 ['274', '589', '674', '720', '779', '792'],  
3553 ['48',  
3554 '126',  
3555 '161',  
3556 '197',

3557 '201',  
3558 '265',  
3559 '283',  
3560 '361',  
3561 '778',  
3562 '859',  
3563 '878',  
3564 '989'],  
3565 ['21',  
3566 '38',  
3567 '57',  
3568 '362',  
3569 '440',  
3570 '494',  
3571 '517',  
3572 '611',  
3573 '647',  
3574 '883',  
3575 '893',  
3576 '918',  
3577 '982'],  
3578 ['117',  
3579 '175',  
3580 '204',  
3581 '304',  
3582 '315',  
3583 '379',  
3584 '438',  
3585 '509',  
3586 '569',  
3587 '576',  
3588 '579',  
3589 '608',  
3590 '738',  
3591 '792'],  
3592 ['93', '203', '204', '529', '647', '692', '732', '949'],  
3593 ['5',  
3594 '31',  
3595 '71',  
3596 '125',  
3597 '279',  
3598 '308',  
3599 '336',  
3600 '354',  
3601 '428',  
3602 '518',  
3603 '523',  
3604 '805',  
3605 '826',  
3606 '921',  
3607 '989'],  
3608 ['10', '55', '93', '131', '140', '192', '409', '438', '638', '663', '711'],  
3609 ['25',  
3610 '41',  
3611 '110',  
3612 '111',  
3613 '140',  
3614 '320',  
3615 '354',  
3616 '395',  
3617 '456',  
3618 '510',  
3619 '554',  
3620 '730',  
3621 '744',  
3622 '752',  
3623 '893',  
3624 '944',  
3625 '975'],  
3626 ['299', '561', '576', '733', '758', '811', '914', '919'],  
3627 ['55', '151', '210', '264', '440', '477', '482', '572', '766'],  
3628 ['33',  
3629 '158',  
3630 '177',  
3631 '217',  
3632 '283',  
3633 '335',  
3634 '346',

3635 '354',  
3636 '360',  
3637 '515',  
3638 '574',  
3639 '713',  
3640 '759'],  
3641 ['120', '256', '412', '631', '692', '740', '752', '762', '829', '852', '964'],  
3642 ['0',  
3643 '10',  
3644 '32',  
3645 '277',  
3646 '298',  
3647 '460',  
3648 '475',  
3649 '523',  
3650 '608',  
3651 '676',  
3652 '682',  
3653 '826',  
3654 '897',  
3655 '950'],  
3656 ['33',  
3657 '39',  
3658 '100',  
3659 '217',  
3660 '283',  
3661 '346',  
3662 '349',  
3663 '443',  
3664 '487',  
3665 '515',  
3666 '541',  
3667 '825'],  
3668 ['350', '411', '572', '579', '803', '842'],  
3669 ['21',  
3670 '38',  
3671 '57',  
3672 '362',  
3673 '605',  
3674 '611',  
3675 '661',  
3676 '682',  
3677 '720',  
3678 '780',  
3679 '825',  
3680 '918'],  
3681 ['57', '117', '614', '658', '814'],  
3682 ['37',  
3683 '75',  
3684 '78',  
3685 '147',  
3686 '183',  
3687 '298',  
3688 '366',  
3689 '538',  
3690 '605',  
3691 '634',  
3692 '738',  
3693 '909',  
3694 '921'],  
3695 ['21', '57', '70', '125', '281', '413', '494', '690', '793', '857'],  
3696 ['45', '171', '419', '517', '571', '600', '769', '883', '896', '999'],  
3697 ['70',  
3698 '115',  
3699 '118',  
3700 '196',  
3701 '301',  
3702 '362',  
3703 '370',  
3704 '489',  
3705 '522',  
3706 '622',  
3707 '684',  
3708 '797',  
3709 '819',  
3710 '820',  
3711 '930',  
3712 '947',



3713 '975'],  
3714 ['70', '407', '486', '572', '718', '765', '819', '914'],  
3715 ['27', '138', '240', '307', '362', '401', '438', '600', '744', '830', '890'],  
3716 ['162', '206', '289', '362', '460', '480', '591', '851'],  
3717 ['120', '207', '294', '392', '512', '724'],  
3718 ['352',  
3719 '448',  
3720 '460',  
3721 '529',  
3722 '557',  
3723 '598',  
3724 '641',  
3725 '746',  
3726 '782',  
3727 '788',  
3728 '939',  
3729 '956'],  
3730 ['168',  
3731 '311',  
3732 '329',  
3733 '349',  
3734 '403',  
3735 '406',  
3736 '419',  
3737 '472',  
3738 '692',  
3739 '765',  
3740 '810',  
3741 '952'],  
3742 ['132', '494', '606', '647', '678', '688', '692', '975'],  
3743 ['25',  
3744 '27',  
3745 '131',  
3746 '304',  
3747 '368',  
3748 '392',  
3749 '440',  
3750 '461',  
3751 '494',  
3752 '517',  
3753 '569',  
3754 '647',  
3755 '655',  
3756 '801',  
3757 '842',  
3758 '854',  
3759 '862',  
3760 '883',  
3761 '893',  
3762 '952',  
3763 '982'],  
3764 ['1', '54', '183', '283', '944', '998'],  
3765 ['17', '388', '480', '500', '544', '736', '742', '803', '839', '945'],  
3766 ['127',  
3767 '151',  
3768 '161',  
3769 '177',  
3770 '229',  
3771 '334',  
3772 '401',  
3773 '427',  
3774 '470',  
3775 '494',  
3776 '509',  
3777 '569',  
3778 '581',  
3779 '758',  
3780 '946'],  
3781 ['255', '283', '480', '743', '745', '763', '782', '995'],  
3782 ['181', '196', '354', '419', '421', '472', '658', '844', '913'],  
3783 ['56', '694', '775', '862'],  
3784 ['48', '145', '160', '580', '795', '963'],  
3785 ['75', '112', '275', '335', '348', '509', '581', '884', '937', '984'],  
3786 ['45',  
3787 '108',  
3788 '136',  
3789 '155',  
3790 '193',

3791 '378',  
3792 '385',  
3793 '583',  
3794 '585',  
3795 '693',  
3796 '843',  
3797 '925',  
3798 '948'],  
3799 ['100',  
3800 '249',  
3801 '355',  
3802 '368',  
3803 '395',  
3804 '438',  
3805 '735',  
3806 '746',  
3807 '854',  
3808 '883',  
3809 '895',  
3810 '905',  
3811 '966'],  
3812 ['110',  
3813 '172',  
3814 '177',  
3815 '310',  
3816 '494',  
3817 '573',  
3818 '600',  
3819 '707',  
3820 '778',  
3821 '867',  
3822 '966',  
3823 '970'],  
3824 ['178', '183', '204', '319', '334', '348', '419', '478', '628', '949', '984'],  
3825 ['58', '332', '421', '651', '890'],  
3826 ['11', '266', '437', '470', '509', '534', '623', '793', '890', '949', '995'],  
3827 ['8', '190', '362', '403', '640', '684', '707', '722', '867', '944'],  
3828 ['27', '58', '354', '357', '480', '638', '752'],  
3829 ['25',  
3830 '55',  
3831 '71',  
3832 '88',  
3833 '141',  
3834 '349',  
3835 '373',  
3836 '438',  
3837 '460',  
3838 '487',  
3839 '567',  
3840 '577',  
3841 '684',  
3842 '778',  
3843 '826',  
3844 '860'],  
3845 ['31', '59', '145', '248', '354', '472', '594', '813', '886', '897', '920'],  
3846 ['266', '348', '437', '509', '623', '890', '949', '984'],  
3847 ['132', '688', '692', '749', '854', '893', '991'],  
3848 ['27',  
3849 '58',  
3850 '104',  
3851 '354',  
3852 '357',  
3853 '480',  
3854 '628',  
3855 '649',  
3856 '735',  
3857 '752',  
3858 '792',  
3859 '798',  
3860 '862',  
3861 '901'],  
3862 ['75', '226', '240', '262', '310', '470', '597', '629'],  
3863 ['186', '217', '265', '546', '661', '895', '923', '947'],  
3864 ['17', '39', '350', '377', '541', '804', '970', '983'],  
3865 ['110',  
3866 '152',  
3867 '207',  
3868 '217',

3869	'339',
3870	'487',
3871	'514',
3872	'522',
3873	'577',
3874	'798',
3875	'805',
3876	'812',
3877	'826',
3878	'937'],
3879	['71', '172', '283', '355', '364', '469', '919', '947'],
3880	['210', '226', '280', '481', '696', '722', '789', '809', '829'],
3881	['112',
3882	'116',
3883	'153',
3884	'252',
3885	'276',
3886	'280',
3887	'296',
3888	'468',
3889	'495',
3890	'527',
3891	'673',
3892	'699',
3893	'703',
3894	'912',
3895	'960'],
3896	['68',
3897	'140',
3898	'258',
3899	'378',
3900	'449',
3901	'489',
3902	'658',
3903	'692',
3904	'792',
3905	'804',
3906	'832',
3907	'839',
3908	'876',
3909	'983'],
3910	['120',
3911	'256',
3912	'350',
3913	'411',
3914	'412',
3915	'529',
3916	'572',
3917	'579',
3918	'740',
3919	'803',
3920	'813',
3921	'829',
3922	'842'],
3923	['205',
3924	'236',
3925	'368',
3926	'460',
3927	'538',
3928	'617',
3929	'778',
3930	'814',
3931	'829',
3932	'865',
3933	'900',
3934	'920'],
3935	['150',
3936	'204',
3937	'236',
3938	'548',
3939	'610',
3940	'628',
3941	'682',
3942	'689',
3943	'731',
3944	'826',
3945	'852',
3946	'897',

```
3947 '906',
3948 '952'],
3949 ['346', '368', '435', '496', '527', '529', '716', '803'],
3950 ['33',
3951 '120',
3952 '197',
3953 '217',
3954 '241',
3955 '283',
3956 '346',
3957 '350',
3958 '515',
3959 '567',
3960 '878',
3961 '893'],
3962 ['5',
3963 '111',
3964 '192',
3965 '205',
3966 '236',
3967 '281',
3968 '561',
3969 '657',
3970 '814',
3971 '820',
3972 '829',
3973 '899',
3974 '982'],
3975 ['21', '151', '266', '296', '760', '854', '899', '988'],
3976 ['94',
3977 '112',
3978 '162',
3979 '354',
3980 '428',
3981 '470',
3982 '509',
3983 '544',
3984 '568',
3985 '585',
3986 '798',
3987 '805',
3988 '966'],
3989 ['579', '581', '966'],
3990 ['217', '423', '529', '567', '594', '738', '824', '913'],
3991 ['55', '118', '264', '572', '676', '689', '757', '766', '854', '883', '970'],
3992 ['173', '215', '487', '522', '710', '731', '838'],
3993 ['12', '39', '69', '173', '522', '775', '792', '825'],
3994 ['48',
3995 '55',
3996 '108',
3997 '156',
3998 '171',
3999 '294',
4000 '419',
4001 '495',
4002 '699',
4003 '703',
4004 '707',
4005 '745'],
4006 ['5',
4007 '31',
4008 '125',
4009 '161',
4010 '276',
4011 '368',
4012 '613',
4013 '614',
4014 '687',
4015 '782',
4016 '784',
4017 '805',
4018 '844',
4019 '914'],
4020 ['132', '298', '318', '496', '849'],
4021 ['329', '395', '411', '618', '631', '874'],
4022 ['90',
4023 '191',
4024 '276',
```

4025 '339',  
4026 '426',  
4027 '526',  
4028 '538',  
4029 '639',  
4030 '707',  
4031 '825',  
4032 '914',  
4033 '937'],  
4034 ['40', '120', '201', '593', '778', '859', '862', '895', '989'],  
4035 ['70', '120', '158', '490', '538', '583', '623', '684', '788', '814'],  
4036 ['41',  
4037 '132',  
4038 '150',  
4039 '204',  
4040 '208',  
4041 '236',  
4042 '541',  
4043 '590',  
4044 '606',  
4045 '638',  
4046 '826',  
4047 '852',  
4048 '906'],  
4049 ['159', '229', '427', '673', '741', '985'],  
4050 ['31',  
4051 '55',  
4052 '132',  
4053 '163',  
4054 '175',  
4055 '310',  
4056 '362',  
4057 '527',  
4058 '597',  
4059 '618',  
4060 '766',  
4061 '775',  
4062 '910',  
4063 '914',  
4064 '960'],  
4065 ['33', '217', '283', '346', '438', '471', '515', '634', '720', '736', '871'],  
4066 ['209', '267', '296', '411', '440', '685', '722', '803', '867'],  
4067 ['278', '329', '368', '413', '417', '682', '692', '733', '860'],  
4068 ['45',  
4069 '147',  
4070 '168',  
4071 '204',  
4072 '275',  
4073 '305',  
4074 '368',  
4075 '427',  
4076 '453',  
4077 '471',  
4078 '484',  
4079 '541',  
4080 '561',  
4081 '651',  
4082 '874',  
4083 '884',  
4084 '920',  
4085 '931',  
4086 '937'],  
4087 ['32', '285', '368', '373', '653', '660', '788', '886', '947'],  
4088 ['35',  
4089 '66',  
4090 '85',  
4091 '526',  
4092 '569',  
4093 '571',  
4094 '623',  
4095 '675',  
4096 '795',  
4097 '798',  
4098 '853',  
4099 '862',  
4100 '886',  
4101 '952',  
4102 '967'],

```
4103 ['18',
4104 '45',
4105 '55',
4106 '100',
4107 '172',
4108 '177',
4109 '194',
4110 '309',
4111 '371',
4112 '401',
4113 '554',
4114 '614',
4115 '692',
4116 '886',
4117 '918'],
4118 ['28',
4119 '48',
4120 '145',
4121 '157',
4122 '274',
4123 '346',
4124 '376',
4125 '381',
4126 '405',
4127 '427',
4128 '614',
4129 '694',
4130 '735',
4131 '742',
4132 '788',
4133 '809',
4134 '897'],
4135 ['362', '413', '631', '752', '762', '838'],
4136 ['145',
4137 '151',
4138 '175',
4139 '177',
4140 '310',
4141 '351',
4142 '362',
4143 '438',
4144 '563',
4145 '567',
4146 '572',
4147 '605',
4148 '709',
4149 '752',
4150 '780',
4151 '935',
4152 '956',
4153 '970'],
4154 ['41',
4155 '75',
4156 '279',
4157 '325',
4158 '423',
4159 '471',
4160 '510',
4161 '521',
4162 '595',
4163 '663',
4164 '686',
4165 '687',
4166 '749',
4167 '775',
4168 '823',
4169 '871',
4170 '966'],
4171 ['258',
4172 '279',
4173 '298',
4174 '362',
4175 '428',
4176 '455',
4177 '522',
4178 '530',
4179 '675',
4180 '682',
```

4181 '752',  
4182 '826',  
4183 '855'],  
4184 ['6', '10', '450', '507'],  
4185 ['110', '207', '215', '522', '685', '688', '798', '826', '838', '867'],  
4186 ['69', '161', '177', '876'],  
4187 ['73', '388', '419', '484', '510', '603', '684', '918', '936', '961'],  
4188 ['127',  
4189 '151',  
4190 '161',  
4191 '318',  
4192 '334',  
4193 '413',  
4194 '427',  
4195 '470',  
4196 '494',  
4197 '569',  
4198 '788',  
4199 '956'],  
4200 ['27', '104', '177', '523', '597', '788', '879'],  
4201 ['220', '368', '423', '712', '722', '947', '967', '981'],  
4202 ['8',  
4203 '32',  
4204 '71',  
4205 '75',  
4206 '108',  
4207 '145',  
4208 '242',  
4209 '438',  
4210 '486',  
4211 '676',  
4212 '684',  
4213 '694',  
4214 '766',  
4215 '958'],  
4216 ['71',  
4217 '145',  
4218 '158',  
4219 '196',  
4220 '558',  
4221 '583',  
4222 '617',  
4223 '670',  
4224 '674',  
4225 '704',  
4226 '774',  
4227 '885'],  
4228 ['70', '120', '247', '354', '424', '623', '800', '859'],  
4229 ['118', '217', '283', '346', '515', '526', '661', '720', '780'],  
4230 ['6',  
4231 '32',  
4232 '78',  
4233 '147',  
4234 '279',  
4235 '329',  
4236 '362',  
4237 '368',  
4238 '392',  
4239 '417',  
4240 '460',  
4241 '472',  
4242 '538',  
4243 '580',  
4244 '634',  
4245 '658',  
4246 '692',  
4247 '738',  
4248 '860',  
4249 '871',  
4250 '973'],  
4251 ['17', '90', '120', '275', '348', '620', '793', '912', '966'],  
4252 ['0',  
4253 '6',  
4254 '140',  
4255 '154',  
4256 '168',  
4257 '239',  
4258 '252',

4259 '257',  
4260 '272',  
4261 '368',  
4262 '415',  
4263 '628',  
4264 '676',  
4265 '744',  
4266 '871',  
4267 '912',  
4268 '913'],  
4269 ['3',  
4270 '154',  
4271 '168',  
4272 '240',  
4273 '272',  
4274 '283',  
4275 '406',  
4276 '432',  
4277 '436',  
4278 '538',  
4279 '628',  
4280 '692',  
4281 '746',  
4282 '788',  
4283 '790',  
4284 '956'],  
4285 ['105', '408', '494', '591', '634', '815', '854', '899', '944'],  
4286 ['217', '490', '577', '614', '722', '804', '825', '856', '906', '937'],  
4287 ['161', '412', '487', '572', '631', '692', '706', '745', '746', '900'],  
4288 ['17', '161', '207', '346', '388', '558', '774', '798', '826'],  
4289 ['220',  
4290 '430',  
4291 '516',  
4292 '578',  
4293 '677',  
4294 '706',  
4295 '744',  
4296 '775',  
4297 '868',  
4298 '942',  
4299 '995',  
4300 '997'],  
4301 ['151', '296', '432', '460', '504', '661', '675', '780', '830', '890'],  
4302 ['58',  
4303 '120',  
4304 '190',  
4305 '354',  
4306 '408',  
4307 '460',  
4308 '500',  
4309 '572',  
4310 '766',  
4311 '815',  
4312 '871',  
4313 '874',  
4314 '888'],  
4315 ['1', '54', '183', '283', '944', '998'],  
4316 ['115', '150', '168', '176', '204', '236', '326', '766', '826', '852', '906'],  
4317 ['17', '27', '217', '236', '240', '541', '892', '956'],  
4318 ['159', '886', '952'],  
4319 ['120', '241', '350', '354', '494', '541', '567', '631', '893', '963'],  
4320 ['6',  
4321 '32',  
4322 '116',  
4323 '381',  
4324 '472',  
4325 '492',  
4326 '523',  
4327 '560',  
4328 '632',  
4329 '706',  
4330 '775',  
4331 '777',  
4332 '778',  
4333 '865',  
4334 '893'],  
4335 ['110', '494', '573', '631', '707', '735', '780', '867'],  
4336 ['27', '58', '354', '357', '480', '752'],



4337	['102', '154', '279', '283', '448', '540', '581', '888'],
4338	['7', '8', '157', '449', '470', '659', '719', '810', '867', '948'],
4339	['71',
4340	'130',
4341	'276',
4342	'299',
4343	'413',
4344	'450',
4345	'634',
4346	'783',
4347	'837',
4348	'914',
4349	'919',
4350	'937',
4351	'942'],
4352	['130', '212', '362', '419', '694', '919'],
4353	['327', '469', '722', '795', '810'],
4354	['21', '136', '193', '413', '585', '793', '843', '857', '925', '948'],
4355	['174',
4356	'241',
4357	'276',
4358	'362',
4359	'368',
4360	'464',
4361	'468',
4362	'538',
4363	'692',
4364	'766',
4365	'832',
4366	'918',
4367	'950',
4368	'960'],
4369	['32', '145', '229', '390', '395', '422', '593', '692', '694', '714', '854'],
4370	['78',
4371	'94',
4372	'129',
4373	'198',
4374	'470',
4375	'644',
4376	'659',
4377	'719',
4378	'810',
4379	'922',
4380	'926',
4381	'960'],
4382	['45',
4383	'48',
4384	'319',
4385	'352',
4386	'368',
4387	'453',
4388	'527',
4389	'529',
4390	'541',
4391	'595',
4392	'676',
4393	'720',
4394	'884',
4395	'920',
4396	'931',
4397	'937'],
4398	['217', '472', '522', '577', '805', '844'],
4399	['126', '162', '206', '289', '319', '480', '499', '591', '639', '765', '851'],
4400	['193',
4401	'315',
4402	'318',
4403	'447',
4404	'484',
4405	'494',
4406	'529',
4407	'594',
4408	'645',
4409	'692',
4410	'775',
4411	'845',
4412	'849',
4413	'998'],
4414	['72', '307', '789', '832', '834', '970', '975'],

4415 ['177', '339', '560', '606', '653', '894', '911'],  
4416 ['139', '229', '290', '401', '440', '482', '509', '581', '631', '740'],  
4417 ['7',  
4418 '154',  
4419 '381',  
4420 '597',  
4421 '631',  
4422 '722',  
4423 '752',  
4424 '812',  
4425 '844',  
4426 '853',  
4427 '859',  
4428 '982'],  
4429 ['116', '125', '161', '217', '346', '368', '561', '573', '580', '653', '888'],  
4430 ['8', '467', '684', '690', '911'],  
4431 ['54',  
4432 '69',  
4433 '100',  
4434 '216',  
4435 '362',  
4436 '387',  
4437 '409',  
4438 '485',  
4439 '617',  
4440 '692',  
4441 '789',  
4442 '798',  
4443 '910',  
4444 '998'],  
4445 ['75',  
4446 '125',  
4447 '130',  
4448 '175',  
4449 '355',  
4450 '368',  
4451 '438',  
4452 '470',  
4453 '530',  
4454 '684',  
4455 '698',  
4456 '832',  
4457 '834',  
4458 '839',  
4459 '975'],  
4460 ['112',  
4461 '145',  
4462 '175',  
4463 '177',  
4464 '265',  
4465 '350',  
4466 '385',  
4467 '460',  
4468 '521',  
4469 '572',  
4470 '612',  
4471 '684',  
4472 '914'],  
4473 ['1',  
4474 '8',  
4475 '48',  
4476 '73',  
4477 '110',  
4478 '140',  
4479 '217',  
4480 '349',  
4481 '455',  
4482 '578',  
4483 '682',  
4484 '710',  
4485 '774',  
4486 '881',  
4487 '883',  
4488 '948'],  
4489 ['151',  
4490 '249',  
4491 '266',  
4492 '346',

4493 '355',  
4494 '373',  
4495 '377',  
4496 '424',  
4497 '494',  
4498 '883',  
4499 '905',  
4500 '988'],  
4501 ['90',  
4502 '170',  
4503 '214',  
4504 '265',  
4505 '266',  
4506 '283',  
4507 '304',  
4508 '406',  
4509 '489',  
4510 '523',  
4511 '675',  
4512 '789',  
4513 '843',  
4514 '883',  
4515 '886',  
4516 '887',  
4517 '932',  
4518 '952'],  
4519 ['57', '145', '368', '494', '658', '682', '937'],  
4520 ['11', '470', '495', '534', '539', '699', '703', '812', '829', '995'],  
4521 ['136', '193', '579', '585', '593', '812', '832', '843', '925', '948'],  
4522 ['25', '68', '496', '524', '626', '774', '864', '947'],  
4523 ['94',  
4524 '327',  
4525 '400',  
4526 '428',  
4527 '469',  
4528 '509',  
4529 '585',  
4530 '758',  
4531 '795',  
4532 '810',  
4533 '866',  
4534 '895'],  
4535 ['12', '401', '597', '663', '760', '912', '923'],  
4536 ['405', '571', '648', '732', '798'],  
4537 ['28',  
4538 '44',  
4539 '48',  
4540 '120',  
4541 '319',  
4542 '352',  
4543 '368',  
4544 '527',  
4545 '529',  
4546 '530',  
4547 '595',  
4548 '676',  
4549 '720',  
4550 '825',  
4551 '879'],  
4552 ['71', '210', '280', '518', '522', '571', '617', '672', '885', '937'],  
4553 ['35', '217', '290', '405', '522', '526', '569', '805', '952'],  
4554 ['28',  
4555 '39',  
4556 '114',  
4557 '230',  
4558 '258',  
4559 '400',  
4560 '419',  
4561 '665',  
4562 '793',  
4563 '844',  
4564 '928',  
4565 '984'],  
4566 ['31', '125', '143', '381', '417', '895', '934'],  
4567 ['73', '110', '510', '682', '710', '774', '878', '883', '919', '948', '980'],  
4568 ['4', '90', '177', '373', '471', '613', '663', '716', '828', '871'],  
4569 ['27',  
4570 '58',

4571 '75',  
4572 '115',  
4573 '354',  
4574 '357',  
4575 '450',  
4576 '480',  
4577 '516',  
4578 '522',  
4579 '752',  
4580 '766',  
4581 '919',  
4582 '937',  
4583 '999'],  
4584 ['395', '472', '844', '854', '895'],  
4585 ['90', '145', '170', '186', '279', '461', '581', '675', '782'],  
4586 ['0', '53', '57', '94', '368', '401', '428', '450', '684', '784', '937'],  
4587 ['69',  
4588 '117',  
4589 '187',  
4590 '204',  
4591 '315',  
4592 '509',  
4593 '538',  
4594 '569',  
4595 '576',  
4596 '713',  
4597 '720',  
4598 '819',  
4599 '878'],  
4600 ['375', '401', '583', '701', '889', '914', '939', '964'],  
4601 ['78', '218', '401', '438', '460', '671', '923'],  
4602 ['164', '188', '213', '225', '381', '634', '782', '804', '983'],  
4603 ['21',  
4604 '46',  
4605 '234',  
4606 '362',  
4607 '368',  
4608 '413',  
4609 '419',  
4610 '438',  
4611 '521',  
4612 '563',  
4613 '793',  
4614 '797',  
4615 '844',  
4616 '904'],  
4617 ['32',  
4618 '193',  
4619 '197',  
4620 '298',  
4621 '401',  
4622 '419',  
4623 '460',  
4624 '569',  
4625 '577',  
4626 '608',  
4627 '676',  
4628 '844',  
4629 '897',  
4630 '989'],  
4631 ['6',  
4632 '12',  
4633 '175',  
4634 '183',  
4635 '227',  
4636 '347',  
4637 '390',  
4638 '402',  
4639 '577',  
4640 '630',  
4641 '722',  
4642 '766',  
4643 '804',  
4644 '831',  
4645 '834'],  
4646 ['6', '475', '676'],  
4647 ['114', '175', '177', '275', '710', '782', '914'],  
4648 ['48', '145', '160', '580', '795', '963'],

4649 ['205', '306', '349', '351', '464', '593', '634'],  
4650 ['204', '529', '732'],  
4651 ['43',  
4652 '283',  
4653 '392',  
4654 '407',  
4655 '522',  
4656 '527',  
4657 '565',  
4658 '617',  
4659 '684',  
4660 '778',  
4661 '846',  
4662 '862',  
4663 '906'],  
4664 ['131', '185', '242', '449', '471', '554', '678', '895', '960'],  
4665 ['145', '349', '794', '888'],  
4666 ['85', '205', '329', '368', '417', '692', '860'],  
4667 ['295', '725', '795', '887', '937', '940'],  
4668 ['396',  
4669 '438',  
4670 '470',  
4671 '548',  
4672 '573',  
4673 '677',  
4674 '744',  
4675 '789',  
4676 '809',  
4677 '811',  
4678 '829',  
4679 '868'],  
4680 ['45',  
4681 '52',  
4682 '110',  
4683 '207',  
4684 '321',  
4685 '419',  
4686 '563',  
4687 '565',  
4688 '665',  
4689 '740',  
4690 '789',  
4691 '798',  
4692 '829',  
4693 '839'],  
4694 ['35', '177', '220', '310', '516', '537', '600', '653', '709', '970', '995'],  
4695 ['58',  
4696 '70',  
4697 '75',  
4698 '80',  
4699 '115',  
4700 '120',  
4701 '140',  
4702 '368',  
4703 '449',  
4704 '513',  
4705 '684',  
4706 '757',  
4707 '765',  
4708 '819',  
4709 '829'],  
4710 ['38',  
4711 '71',  
4712 '192',  
4713 '252',  
4714 '283',  
4715 '520',  
4716 '526',  
4717 '720',  
4718 '722',  
4719 '798',  
4720 '918',  
4721 '948'],  
4722 ['120',  
4723 '136',  
4724 '236',  
4725 '493',  
4726 '538',

4727 '546',  
4728 '568',  
4729 '614',  
4730 '641',  
4731 '665',  
4732 '878',  
4733 '914',  
4734 '921',  
4735 '981'],  
4736 ['346', '448', '477', '538', '561', '605', '780', '878', '887', '888'],  
4737 ['12',  
4738 '120',  
4739 '132',  
4740 '296',  
4741 '368',  
4742 '401',  
4743 '571',  
4744 '638',  
4745 '679',  
4746 '829',  
4747 '885',  
4748 '897'],  
4749 ['27', '115', '236', '240', '541', '605', '788', '956'],  
4750 ['201', '274', '423', '487', '567', '631', '824', '913'],  
4751 ['33',  
4752 '48',  
4753 '145',  
4754 '160',  
4755 '177',  
4756 '274',  
4757 '573',  
4758 '580',  
4759 '740',  
4760 '795',  
4761 '883',  
4762 '963'],  
4763 ['37',  
4764 '145',  
4765 '175',  
4766 '177',  
4767 '183',  
4768 '279',  
4769 '349',  
4770 '366',  
4771 '373',  
4772 '428',  
4773 '572',  
4774 '660',  
4775 '674',  
4776 '720',  
4777 '736',  
4778 '788',  
4779 '814',  
4780 '826',  
4781 '844',  
4782 '886',  
4783 '888'],  
4784 ['26', '82', '111', '141', '629', '661', '720', '780'],  
4785 ['112', '125', '130', '521', '698', '839', '914', '919'],  
4786 ['33', '217', '283', '346', '471', '515', '575', '673'],  
4787 ['25',  
4788 '52',  
4789 '89',  
4790 '122',  
4791 '224',  
4792 '258',  
4793 '294',  
4794 '381',  
4795 '472',  
4796 '523',  
4797 '730',  
4798 '758',  
4799 '931',  
4800 '949'],  
4801 ['69', '296', '368', '803', '829', '860', '921'],  
4802 ['48',  
4803 '59',  
4804 '108',

4805 '126',  
4806 '185',  
4807 '361',  
4808 '448',  
4809 '471',  
4810 '498',  
4811 '538',  
4812 '678',  
4813 '780',  
4814 '817',  
4815 '878',  
4816 '887',  
4817 '960'],  
4818 ['24',  
4819 '38',  
4820 '151',  
4821 '275',  
4822 '322',  
4823 '343',  
4824 '387',  
4825 '620',  
4826 '765',  
4827 '803',  
4828 '915',  
4829 '952'],  
4830 ['51', '136', '140', '460', '507', '531', '675', '769', '949', '998'],  
4831 ['168', '332', '477', '539', '548', '578', '684', '766', '775', '812', '829'],  
4832 ['14',  
4833 '35',  
4834 '95',  
4835 '160',  
4836 '175',  
4837 '517',  
4838 '597',  
4839 '653',  
4840 '722',  
4841 '766',  
4842 '889',  
4843 '910',  
4844 '966'],  
4845 ['239', '593', '804', '812', '832', '919'],  
4846 ['10',  
4847 '88',  
4848 '192',  
4849 '255',  
4850 '310',  
4851 '571',  
4852 '702',  
4853 '709',  
4854 '711',  
4855 '752',  
4856 '859',  
4857 '890',  
4858 '956',  
4859 '970'],  
4860 ['28', '132', '236', '349', '661', '943'],  
4861 ['11', '256', '378', '470', '487', '510', '534', '793', '912', '978', '995'],  
4862 ['12', '39', '158', '227', '390', '583', '617', '704', '722', '825'],  
4863 ['229', '687'],  
4864 ['392', '398', '440', '461', '568', '569', '801', '862', '953'],  
4865 ['12', '32', '120', '132', '472', '516', '638', '744', '788', '844', '885'],  
4866 ['93',  
4867 '97',  
4868 '217',  
4869 '276',  
4870 '299',  
4871 '413',  
4872 '546',  
4873 '634',  
4874 '661',  
4875 '783',  
4876 '789',  
4877 '837',  
4878 '923',  
4879 '942',  
4880 '947'],  
4881 ['75', '93', '258', '283', '469', '538', '642', '874', '919', '921'],  
4882 ['67', '143', '460', '481', '746', '797', '919'],

4883 ['78', '218', '401', '438', '460', '671', '923'],  
4884 ['154', '168', '201', '272', '436', '490', '628'],  
4885 ['93', '162', '177', '373', '474', '493'],  
4886 ['25', '38', '151', '266', '296', '310', '418', '766', '895', '988'],  
4887 ['12', '21', '93', '197', '350', '760', '782', '841', '878'],  
4888 ['27',  
4889 '69',  
4890 '115',  
4891 '187',  
4892 '350',  
4893 '411',  
4894 '572',  
4895 '579',  
4896 '605',  
4897 '720',  
4898 '798',  
4899 '803',  
4900 '842'],  
4901 ['150', '204', '236', '826', '852', '906'],  
4902 ['368', '529', '598', '782'],  
4903 ['17', '162', '217', '381', '427', '458', '711', '789', '800', '944'],  
4904 ['8',  
4905 '36',  
4906 '122',  
4907 '130',  
4908 '274',  
4909 '424',  
4910 '467',  
4911 '505',  
4912 '608',  
4913 '682',  
4914 '792',  
4915 '925',  
4916 '981'],  
4917 ['115', '215', '450', '561', '614', '658', '687', '693', '765', '919', '937'],  
4918 ['8', '145', '175', '177', '239', '572', '867'],  
4919 ['98',  
4920 '140',  
4921 '146',  
4922 '217',  
4923 '326',  
4924 '343',  
4925 '598',  
4926 '686',  
4927 '766',  
4928 '800',  
4929 '928',  
4930 '943'],  
4931 ['22', '206', '239', '319', '505', '540', '616', '706', '742', '804', '919'],  
4932 ['43', '90', '172', '177', '407', '529', '613', '639', '828', '902'],  
4933 ['129', '145', '277', '437', '467'],  
4934 ['72', '93', '350', '556', '606', '928'],  
4935 ['10',  
4936 '39',  
4937 '85',  
4938 '111',  
4939 '122',  
4940 '154',  
4941 '168',  
4942 '246',  
4943 '354',  
4944 '362',  
4945 '394',  
4946 '440',  
4947 '484',  
4948 '711',  
4949 '722',  
4950 '735',  
4951 '809',  
4952 '918'],  
4953 ['450', '919', '937'],  
4954 ['289', '335', '617', '623', '639', '701', '805', '946'],  
4955 ['118', '301', '362', '459', '489', '522', '622', '675', '701', '921', '930'],  
4956 ['54',  
4957 '68',  
4958 '142',  
4959 '183',  
4960 '381',



4961 '529',  
4962 '593',  
4963 '655',  
4964 '766',  
4965 '815',  
4966 '829',  
4967 '831'],  
4968 ['7', '449', '470', '529', '851', '948'],  
4969 ['198', '429', '505', '853', '883', '910'],  
4970 ['94',  
4971 '112',  
4972 '170',  
4973 '277',  
4974 '429',  
4975 '548',  
4976 '647',  
4977 '746',  
4978 '788',  
4979 '814',  
4980 '926',  
4981 '956'],  
4982 ['5', '72', '357', '403', '452', '460', '653', '708', '885', '886'],  
4983 ['41', '141', '290', '477', '684', '720', '766', '862', '893'],  
4984 ['10', '96', '100', '493', '623', '638', '722', '757', '970', '978'],  
4985 ['70',  
4986 '105',  
4987 '276',  
4988 '362',  
4989 '494',  
4990 '631',  
4991 '684',  
4992 '752',  
4993 '762',  
4994 '765',  
4995 '815',  
4996 '819',  
4997 '838',  
4998 '886',  
4999 '944'],  
5000 ['185', '368', '461', '561', '675', '687', '829'],  
5001 ['12',  
5002 '15',  
5003 '71',  
5004 '165',  
5005 '175',  
5006 '460',  
5007 '529',  
5008 '550',  
5009 '579',  
5010 '632',  
5011 '795',  
5012 '857',  
5013 '922'],  
5014 ['6', '43', '140', '319', '429', '472', '574', '605', '769', '782'],  
5015 ['140', '319', '405', '571', '605', '648', '732', '769', '798'],  
5016 ['26',  
5017 '100',  
5018 '129',  
5019 '172',  
5020 '194',  
5021 '205',  
5022 '290',  
5023 '496',  
5024 '525',  
5025 '626',  
5026 '766',  
5027 '843',  
5028 '895',  
5029 '913',  
5030 '916',  
5031 '960'],  
5032 ['120', '168', '214', '266', '279', '766', '874', '885'],  
5033 ['52', '115', '227', '390', '516', '598', '722', '766'],  
5034 ['8', '14', '160', '653', '684', '706', '829', '867', '885', '887'],  
5035 ['392', '411', '484', '489', '632', '720', '862'],  
5036 ['48',  
5037 '54',  
5038 '126',

5039 '205',  
5040 '296',  
5041 '361',  
5042 '541',  
5043 '600',  
5044 '633',  
5045 '843',  
5046 '878',  
5047 '992'],  
5048 ['31', '529', '548', '591', '595', '721', '885'],  
5049 ['320',  
5050 '362',  
5051 '455',  
5052 '539',  
5053 '561',  
5054 '645',  
5055 '704',  
5056 '707',  
5057 '722',  
5058 '752',  
5059 '758',  
5060 '763',  
5061 '914',  
5062 '919',  
5063 '934',  
5064 '943'],  
5065 ['1', '112', '304', '514', '529', '800'],  
5066 ['116', '177', '201', '333', '653', '692', '720', '749', '846', '893', '991'],  
5067 ['154', '227', '381', '383', '390', '460', '531', '548', '812', '844', '858'],  
5068 ['14',  
5069 '157',  
5070 '160',  
5071 '653',  
5072 '661',  
5073 '719',  
5074 '720',  
5075 '732',  
5076 '780',  
5077 '887',  
5078 '895',  
5079 '897'],  
5080 ['335',  
5081 '368',  
5082 '414',  
5083 '512',  
5084 '513',  
5085 '557',  
5086 '653',  
5087 '687',  
5088 '690',  
5089 '795',  
5090 '914',  
5091 '937'],  
5092 ['33', '217', '283', '346', '496', '515', '626'],  
5093 ['39',  
5094 '145',  
5095 '295',  
5096 '346',  
5097 '419',  
5098 '427',  
5099 '509',  
5100 '525',  
5101 '541',  
5102 '763',  
5103 '769',  
5104 '800',  
5105 '830',  
5106 '844'],  
5107 ['104',  
5108 '196',  
5109 '210',  
5110 '229',  
5111 '411',  
5112 '422',  
5113 '516',  
5114 '686',  
5115 '692',  
5116 '708',

5117 '714',  
5118 '883'],  
5119 ['21', '105', '413', '494', '793', '815', '857', '862', '944'],  
5120 ['177', '368', '571', '623', '795', '829', '853', '946'],  
5121 ['69',  
5122 '285',  
5123 '366',  
5124 '381',  
5125 '419',  
5126 '460',  
5127 '521',  
5128 '569',  
5129 '720',  
5130 '777',  
5131 '871',  
5132 '897',  
5133 '928',  
5134 '958'],  
5135 ['443', '459', '601', '675', '701', '809', '841', '883', '921'],  
5136 ['12',  
5137 '39',  
5138 '57',  
5139 '69',  
5140 '173',  
5141 '204',  
5142 '358',  
5143 '368',  
5144 '522',  
5145 '738',  
5146 '775',  
5147 '792',  
5148 '825',  
5149 '937'],  
5150 ['70',  
5151 '120',  
5152 '126',  
5153 '145',  
5154 '196',  
5155 '217',  
5156 '220',  
5157 '239',  
5158 '411',  
5159 '428',  
5160 '439',  
5161 '546',  
5162 '623',  
5163 '661',  
5164 '674',  
5165 '804',  
5166 '919',  
5167 '923',  
5168 '947'],  
5169 ['171', '227', '289', '462', '674', '946', '964'],  
5170 ['17',  
5171 '145',  
5172 '217',  
5173 '279',  
5174 '322',  
5175 '354',  
5176 '377',  
5177 '422',  
5178 '487',  
5179 '515',  
5180 '541',  
5181 '546',  
5182 '600',  
5183 '602',  
5184 '661',  
5185 '697',  
5186 '797',  
5187 '885',  
5188 '923',  
5189 '947'],  
5190 ['78',  
5191 '183',  
5192 '263',  
5193 '456',  
5194 '480',

5195 '550',  
5196 '676',  
5197 '743',  
5198 '745',  
5199 '769',  
5200 '782',  
5201 '886',  
5202 '909',  
5203 '980'],  
5204 ['94',  
5205 '112',  
5206 '163',  
5207 '164',  
5208 '429',  
5209 '600',  
5210 '630',  
5211 '744',  
5212 '789',  
5213 '825',  
5214 '829',  
5215 '854'],  
5216 ['201', '234', '265', '268', '274', '448', '490', '631', '638', '763'],  
5217 ['33', '57', '127', '661', '846'],  
5218 ['6',  
5219 '28',  
5220 '73',  
5221 '118',  
5222 '415',  
5223 '449',  
5224 '489',  
5225 '530',  
5226 '676',  
5227 '744',  
5228 '833',  
5229 '913'],  
5230 ['32', '206', '525', '742', '916'],  
5231 ['28', '32', '36', '467', '505', '516', '682', '744', '750', '798'],  
5232 ['33', '57', '127', '661', '846'],  
5233 ['15',  
5234 '283',  
5235 '375',  
5236 '385',  
5237 '494',  
5238 '721',  
5239 '731',  
5240 '789',  
5241 '790',  
5242 '826',  
5243 '829',  
5244 '860',  
5245 '883',  
5246 '885'],  
5247 ['35',  
5248 '73',  
5249 '170',  
5250 '214',  
5251 '324',  
5252 '346',  
5253 '387',  
5254 '427',  
5255 '529',  
5256 '556',  
5257 '736',  
5258 '750',  
5259 '800',  
5260 '928'],  
5261 ['6',  
5262 '80',  
5263 '385',  
5264 '415',  
5265 '429',  
5266 '460',  
5267 '577',  
5268 '649',  
5269 '684',  
5270 '716',  
5271 '782',  
5272 '860',

5273 '913',  
5274 '923'],  
5275 ['145', '308', '470', '534', '580', '795', '814', '995'],  
5276 ['2',  
5277 '215',  
5278 '280',  
5279 '390',  
5280 '573',  
5281 '766',  
5282 '809',  
5283 '811',  
5284 '812',  
5285 '826',  
5286 '829',  
5287 '874',  
5288 '966'],  
5289 ['37', '71', '214', '577', '600', '706', '919', '992'],  
5290 ['177', '310', '400', '600', '709', '758', '866', '895', '970'],  
5291 ['114', '175', '177', '275', '710', '782', '914'],  
5292 ['73', '118', '274', '310', '449'],  
5293 ['12',  
5294 '120',  
5295 '217',  
5296 '272',  
5297 '349',  
5298 '350',  
5299 '354',  
5300 '394',  
5301 '487',  
5302 '510',  
5303 '562',  
5304 '685',  
5305 '782',  
5306 '804',  
5307 '841',  
5308 '948'],  
5309 ['154', '186', '265', '448', '780', '812', '887', '895'],  
5310 ['37', '39', '43', '440', '597', '618', '736', '814', '844', '932'],  
5311 ['73', '173', '177', '203', '604', '675', '784', '844', '891', '947'],  
5312 ['39', '458', '531', '580', '832', '871', '988'],  
5313 ['71',  
5314 '318',  
5315 '336',  
5316 '354',  
5317 '413',  
5318 '509',  
5319 '593',  
5320 '788',  
5321 '857',  
5322 '921',  
5323 '937',  
5324 '954',  
5325 '956',  
5326 '964',  
5327 '989'],  
5328 ['120',  
5329 '160',  
5330 '183',  
5331 '205',  
5332 '306',  
5333 '430',  
5334 '504',  
5335 '593',  
5336 '763',  
5337 '775',  
5338 '795',  
5339 '830',  
5340 '862',  
5341 '895',  
5342 '998'],  
5343 ['110', '122', '198', '207', '530', '673', '723', '798', '826'],  
5344 ['69', '112', '116', '201', '333', '362', '563', '653', '720', '846'],  
5345 ['82',  
5346 '224',  
5347 '228',  
5348 '390',  
5349 '395',  
5350 '500',

5351 '511',  
5352 '527',  
5353 '760',  
5354 '854',  
5355 '945',  
5356 '982'],  
5357 ['48', '78', '177', '613', '692', '752', '828', '964'],  
5358 ['18', '54', '68', '118', '142', '438', '533', '593', '655', '740', '815'],  
5359 ['97',  
5360 '110',  
5361 '175',  
5362 '276',  
5363 '368',  
5364 '734',  
5365 '782',  
5366 '795',  
5367 '834',  
5368 '883',  
5369 '975',  
5370 '983',  
5371 '995'],  
5372 ['8',  
5373 '36',  
5374 '41',  
5375 '71',  
5376 '210',  
5377 '274',  
5378 '424',  
5379 '522',  
5380 '617',  
5381 '793',  
5382 '925',  
5383 '937',  
5384 '981'],  
5385 ['39', '78', '94', '198', '419', '644', '922', '926'],  
5386 ['36',  
5387 '151',  
5388 '275',  
5389 '322',  
5390 '343',  
5391 '467',  
5392 '505',  
5393 '513',  
5394 '620',  
5395 '682',  
5396 '720',  
5397 '766',  
5398 '803',  
5399 '914',  
5400 '984'],  
5401 ['28', '239', '521', '627', '699', '946'],  
5402 ['8', '31', '43', '69', '259', '362', '429', '782', '854', '933'],  
5403 ['461', '569', '801', '862'],  
5404 ['138', '283', '307', '375', '385', '486', '721', '731', '790', '885'],  
5405 ['354', '510', '517', '581', '722', '854'],  
5406 ['192', '427', '673', '692', '893', '935', '991'],  
5407 ['12',  
5408 '37',  
5409 '161',  
5410 '168',  
5411 '259',  
5412 '299',  
5413 '350',  
5414 '362',  
5415 '472',  
5416 '561',  
5417 '605',  
5418 '782',  
5419 '841',  
5420 '844',  
5421 '921'],  
5422 ['144',  
5423 '208',  
5424 '231',  
5425 '290',  
5426 '390',  
5427 '403',  
5428 '458',

5429 '474',  
5430 '548',  
5431 '561',  
5432 '888',  
5433 '895',  
5434 '969'],  
5435 ['35', '75', '158', '300', '354', '536', '583', '617', '885', '920', '949'],  
5436 ['350', '411', '427', '561', '579', '673', '778', '803', '842', '865'],  
5437 ['113', '176', '210', '406', '788', '789', '829'],  
5438 ['57', '178', '534', '614', '658', '814', '927'],  
5439 ['71', '187', '213', '326', '629', '841'],  
5440 ['38', '71', '266', '283', '523', '766', '944'],  
5441 ['158', '164', '327', '405', '484', '783', '804'],  
5442 ['96',  
5443 '154',  
5444 '168',  
5445 '258',  
5446 '272',  
5447 '303',  
5448 '364',  
5449 '436',  
5450 '524',  
5451 '554',  
5452 '573',  
5453 '628',  
5454 '922',  
5455 '943',  
5456 '998'],  
5457 ['5',  
5458 '12',  
5459 '154',  
5460 '227',  
5461 '352',  
5462 '390',  
5463 '429',  
5464 '593',  
5465 '722',  
5466 '736',  
5467 '782',  
5468 '956'],  
5469 ['274', '349', '351', '464', '521', '634', '639', '699', '854', '855', '899'],  
5470 ['28', '112', '214', '440', '504', '530', '809', '956'],  
5471 ['368', '571', '623', '653', '795', '853'],  
5472 ['12', '120', '227', '241', '350', '354', '390', '567', '704', '722', '884'],  
5473 ['309', '347', '551', '829', '921'],  
5474 ['73', '505', '548', '641'],  
5475 ['52', '72', '90', '103', '170', '480', '598', '675', '841', '886', '946'],  
5476 ['188', '276', '468', '505', '706', '716', '804', '854', '899', '960'],  
5477 ['125', '130', '698', '839'],  
5478 ['8', '12', '70', '90', '239', '283', '285', '470', '550', '793'],  
5479 ['0', '10', '57', '104', '173', '450', '710', '731', '937'],  
5480 ['151', '266', '988'],  
5481 ['117', '129', '276', '468', '689', '692', '723', '887', '960'],  
5482 ['58', '140', '190', '354', '460', '859'],  
5483 ['69', '112', '362', '442', '471', '563', '758'],  
5484 ['29', '217', '546', '597', '661', '830', '846', '859', '883', '923', '947'],  
5485 ['177', '217', '346', '440', '561', '604', '766', '784', '832', '888', '947'],  
5486 ['7',  
5487 '72',  
5488 '128',  
5489 '176',  
5490 '198',  
5491 '280',  
5492 '427',  
5493 '429',  
5494 '505',  
5495 '529',  
5496 '692',  
5497 '763',  
5498 '853',  
5499 '883',  
5500 '910'],  
5501 ['58',  
5502 '73',  
5503 '183',  
5504 '203',  
5505 '210',  
5506 '229',

5507 '422',  
5508 '510',  
5509 '603',  
5510 '684',  
5511 '692',  
5512 '714',  
5513 '792',  
5514 '936',  
5515 '961'],  
5516 ['411', '561', '800', '829'],  
5517 ['95', '116', '154', '280', '354', '517', '597', '618', '722', '932'],  
5518 ['0',  
5519 '168',  
5520 '183',  
5521 '277',  
5522 '366',  
5523 '475',  
5524 '523',  
5525 '674',  
5526 '682',  
5527 '720',  
5528 '763',  
5529 '826',  
5530 '830',  
5531 '950'],  
5532 ['101', '147', '229', '265', '283', '657', '903'],  
5533 ['21', '38', '57', '362', '611', '918'],  
5534 ['145',  
5535 '175',  
5536 '489',  
5537 '541',  
5538 '597',  
5539 '686',  
5540 '744',  
5541 '795',  
5542 '846',  
5543 '910',  
5544 '960',  
5545 '973'],  
5546 ['43', '51', '620', '705'],  
5547 ['25', '52', '175', '183', '239', '730', '800', '937'],  
5548 ['52', '140', '319', '579', '581', '598', '605', '769', '966'],  
5549 ['73', '118', '204', '274', '310', '319', '449', '579', '736', '778', '972'],  
5550 ['4', '112', '131', '170', '403', '430', '530', '755', '820', '963'],  
5551 ['70', '143', '623'],  
5552 ['181', '387', '412', '481', '581', '884'],  
5553 ['8',  
5554 '12',  
5555 '116',  
5556 '153',  
5557 '217',  
5558 '346',  
5559 '422',  
5560 '561',  
5561 '674',  
5562 '686',  
5563 '823',  
5564 '888',  
5565 '893',  
5566 '918'],  
5567 ['93',  
5568 '139',  
5569 '164',  
5570 '213',  
5571 '217',  
5572 '225',  
5573 '227',  
5574 '346',  
5575 '494',  
5576 '538',  
5577 '561',  
5578 '782',  
5579 '874',  
5580 '921',  
5581 '932'],  
5582 ['43',  
5583 '57',  
5584 '70',



5585 '93',  
5586 '176',  
5587 '227',  
5588 '349',  
5589 '351',  
5590 '444',  
5591 '464',  
5592 '513',  
5593 '598',  
5594 '634',  
5595 '694',  
5596 '805',  
5597 '835'],  
5598 ['157',  
5599 '236',  
5600 '423',  
5601 '470',  
5602 '516',  
5603 '659',  
5604 '661',  
5605 '744',  
5606 '753',  
5607 '810',  
5608 '821',  
5609 '960'],  
5610 ['329',  
5611 '368',  
5612 '373',  
5613 '379',  
5614 '417',  
5615 '438',  
5616 '660',  
5617 '692',  
5618 '738',  
5619 '788',  
5620 '860',  
5621 '886'],  
5622 ['188',  
5623 '279',  
5624 '364',  
5625 '388',  
5626 '438',  
5627 '500',  
5628 '524',  
5629 '571',  
5630 '573',  
5631 '634',  
5632 '638',  
5633 '922',  
5634 '945',  
5635 '953'],  
5636 ['89', '258', '294', '472', '523', '758', '931', '949'],  
5637 ['39', '350', '970'],  
5638 ['100',  
5639 '204',  
5640 '334',  
5641 '368',  
5642 '438',  
5643 '579',  
5644 '593',  
5645 '703',  
5646 '735',  
5647 '746',  
5648 '812',  
5649 '832',  
5650 '895',  
5651 '966'],  
5652 ['39', '95', '181', '295', '303', '368', '390', '470', '704', '758', '825'],  
5653 ['90',  
5654 '141',  
5655 '177',  
5656 '526',  
5657 '589',  
5658 '597',  
5659 '613',  
5660 '701',  
5661 '720',  
5662 '792',

```
5663     '828',
5664     '953',
5665     '982'],
5666     ['12', '39', '69', '173', '419', '522', '581', '752', '775', '792', '825'],
5667     ['171',
5668      '240',
5669      '296',
5670      '460',
5671      '516',
5672      '523',
5673      '598',
5674      '610',
5675      '671',
5676      '675',
5677      '722',
5678      '733',
5679      '982',
5680      '991',
5681      '998'],
5682     ['32',
5683      '73',
5684      '98',
5685      '175',
5686      '188',
5687      '368',
5688      '387',
5689      '530',
5690      '590',
5691      '597',
5692      '598',
5693      '766',
5694      '910',
5695      '960'],
5696     ['35', '120', '204', '215', '449', '703', '812', '895'],
5697     ['28',
5698      '112',
5699      '171',
5700      '240',
5701      '432',
5702      '504',
5703      '561',
5704      '598',
5705      '671',
5706      '775',
5707      '982',
5708      '991',
5709      '998'],
5710     ...]
```

## 寻找数据频繁项集

### 利用Apriori算法进行寻找

```
1  te = TransactionEncoder()
2  te_ary = te.fit(data).transform(data)
3  df = pd.DataFrame(te_ary, columns=te.columns_)
4
5
6  frequent_itemsets = apriori(df, min_support=0.02, use_colnames=True)
7
8  print('以下为使用Apriori算法进行寻找频繁项集的结果')
9  frequent_itemsets
```

```
1  以下为使用Apriori算法进行寻找频繁项集的结果
```

```

1 .dataframe tbody tr th {
2     vertical-align: top;
3 }
4
5 .dataframe thead th {
6     text-align: right;
7 }

```

	support	itemsets
<b>0</b>	0.02680	(112)
<b>1</b>	0.02193	(116)
<b>2</b>	0.03415	(12)
<b>3</b>	0.04973	(120)
<b>4</b>	0.02641	(132)
...	...	...
<b>150</b>	0.03626	(956)
<b>151</b>	0.02732	(960)
<b>152</b>	0.03921	(966)
<b>153</b>	0.02086	(970)
<b>154</b>	0.02713	(998)

155 rows × 2 columns

## 利用FpGrowth算法寻找

```

1 te = TransactionEncoder()
2 te_ary = te.fit(data).transform(data)
3 df = pd.DataFrame(te_ary, columns=te.columns_)
4
5
6 frequent_itemsets = fpgrowth(df, min_support=0.02, use_colnames=True)
7
8 print('以下为使用FpGrowth算法进行寻找频繁项集的结果')
9 frequent_itemsets

```

1 以下为使用FpGrowth算法进行寻找频繁项集的结果

```

1 .dataframe tbody tr th {
2     vertical-align: top;
3 }
4
5 .dataframe thead th {
6     text-align: right;
7 }

```

	support	itemsets
0	0.07828	(368)
1	0.03982	(538)
2	0.03771	(775)
3	0.03085	(825)
4	0.02783	(561)
...	...	...
150	0.03281	(510)
151	0.02022	(826)
152	0.02693	(661)
153	0.02492	(634)
154	0.02082	(450)

155 rows × 2 columns

结论：两种算法进行比较，其结果相同，但是FpGrowth算法明显快于Apriori算法，因此以下均使用FpGrowth算法

计算最大频繁项集（在min\_support=0.001计算）

```
1 fi2 = fpgrowth(df, min_support=0.001, use_colnames=True)
2 #frequent_itemsets = apriori(df, min_support=0.01, use_colnames=True)
3 #frequent_itemsets = fpmax(df, min_support=0.01, use_colnames=True)
4 print('以下为support大于0.001的情况下频繁项集')
5 fi2
```

```
1  |  以下为support>0.001的情况下频繁项集
```

```
1 .dataframe tbody tr th {
2     vertical-align: top;
3 }
4
5 .dataframe thead th {
6     text-align: right;
7 }
```

	support	itemsets
0	0.07828	(368)
1	0.03982	(538)
2	0.03771	(775)
3	0.03085	(825)
4	0.02783	(561)
...	...	...
27527	0.00182	(890, 806, 886, 259, 38, 640)
27528	0.00181	(890, 806, 886, 259, 722, 38)
27529	0.00180	(806, 886, 259, 722, 38, 640)
27530	0.00179	(890, 806, 886, 259, 722, 38, 640)
27531	0.00100	(847, 37)

27532 rows × 2 columns

```
1 fi2['length'] = fi2['itemsets'].apply(lambda x: len(x))
2 print('以下为support大于0.001的情况下频繁项集及其长度')
3 fi2
```

1 以下为support大于0.001的情况下频繁项集及其长度

```
1 .dataframe tbody tr th {
2     vertical-align: top;
3 }
4
5 .dataframe thead th {
6     text-align: right;
7 }
```

	support	itemsets	length
0	0.07828	(368)	1
1	0.03982	(538)	1
2	0.03771	(775)	1
3	0.03085	(825)	1
4	0.02783	(561)	1
...	...	...	...
27527	0.00182	(890, 806, 886, 259, 38, 640)	6
27528	0.00181	(890, 806, 886, 259, 722, 38)	6
27529	0.00180	(806, 886, 259, 722, 38, 640)	6
27530	0.00179	(890, 806, 886, 259, 722, 38, 640)	7
27531	0.00100	(847, 37)	2

27532 rows × 3 columns

```
1 fi2_max = fpmax(df, min_support=0.001, use_colnames=True)
2 print('以下为support>0.001的情况下最大频繁项集')
3 fi2_max
```

1 以下为support>0.001的情况下最大频繁项集

```
1 .dataframe tbody tr th {
2     vertical-align: top;
3 }
4
5 .dataframe thead th {
6     text-align: right;
7 }
```

	support	itemsets
0	0.00102	(729)
1	0.00102	(330)
2	0.00103	(490, 856, 906)
3	0.00109	(199)
4	0.00109	(102)
...	...	...
4049	0.00294	(722, 829)
4050	0.00328	(722, 766)
4051	0.00392	(368, 722)
4052	0.00317	(766, 529)
4053	0.00321	(829, 766)

4054 rows × 2 columns

## 挖掘关联规则

### 分别使用confidence和lift指标

```
1 rules1=association_rules(fi2, metric="confidence", min_threshold=0.997)
2 print(' 以下为使用confidence指标且大于0.997情况下的关联规则')
3 rules1
4
5 rules2 = association_rules(fi2, metric="lift", min_threshold=700)
6 print(' 以下为使用lift指标且大于700情况下的关联规则')
7 rules2
```

1 | 以下为使用confidence指标且大于0.997情况下的关联规则

```
1 .dataframe tbody tr th {
2     vertical-align: top;
3 }
4
5 .dataframe thead th {
6     text-align: right;
7 }
```

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction
0	(489, 145, 283)	(674)	0.00248	0.02527	0.00248	1.0	39.572616	0.002417	inf
1	(489, 39, 145, 283)	(674)	0.00245	0.02527	0.00245	1.0	39.572616	0.002388	inf
2	(422, 145, 487)	(885)	0.00138	0.03043	0.00138	1.0	32.862307	0.001338	inf
3	(354, 422, 487)	(885)	0.00133	0.03043	0.00133	1.0	32.862307	0.001290	inf
4	(354, 422, 145, 487)	(885)	0.00131	0.03043	0.00131	1.0	32.862307	0.001270	inf
...	...	...	...	...	...	...	...	...	...
882	(351, 72, 749, 841)	(268, 545)	0.00114	0.00119	0.00114	1.0	840.336134	0.001139	inf
883	(841, 606, 72, 351, 749)	(545)	0.00113	0.00119	0.00113	1.0	840.336134	0.001129	inf
884	(841, 545, 606, 72, 351, 749)	(268)	0.00113	0.00885	0.00113	1.0	112.994350	0.001120	inf
885	(841, 606, 72, 268, 351, 749)	(545)	0.00113	0.00119	0.00113	1.0	840.336134	0.001129	inf
886	(841, 606, 72, 351, 749)	(268, 545)	0.00113	0.00119	0.00113	1.0	840.336134	0.001129	inf

887 rows × 9 columns

1 | 以下为使用lift指标且大于700情况下的关联规则

```
1 .dataframe tbody tr th {
2     vertical-align: top;
3 }
4
5 .dataframe thead th {
6     text-align: right;
7 }
```

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction
0	(849, 809)	(447, 594)	0.00119	0.00128	0.00109	0.915966	715.598739	0.001088	11.884768
1	(447, 594)	(849, 809)	0.00128	0.00119	0.00109	0.851562	715.598739	0.001088	6.728825
2	(849, 809, 529)	(447, 594)	0.00114	0.00128	0.00107	0.938596	733.278509	0.001069	16.264869
3	(447, 809, 529)	(849, 594)	0.00122	0.00121	0.00107	0.877049	724.834033	0.001069	8.123492
4	(809, 529, 594)	(849, 447)	0.00117	0.00123	0.00107	0.914530	743.520256	0.001069	11.685609
...	...	...	...	...	...	...	...	...	...
4207	(476)	(914, 319, 145)	0.00133	0.00104	0.00102	0.766917	737.420474	0.001019	4.285861
4208	(914, 536)	(476)	0.00104	0.00133	0.00100	0.961538	722.961249	0.000999	25.965420
4209	(476)	(914, 536)	0.00133	0.00104	0.00100	0.751880	722.961249	0.000999	4.026112
4210	(319, 536)	(476)	0.00105	0.00133	0.00100	0.952381	716.075904	0.000999	20.972070
4211	(476)	(319, 536)	0.00133	0.00105	0.00100	0.751880	716.075904	0.000999	4.026071

4212 rows × 9 columns

## 联合使用confidence与lift指标

```
1 rules = rules1.drop(rules1[rules1.lift <700].index)
2 #设置标题索引并打印结果
3 rules.rename(columns = {'antecedents':'from','consequents':'to','support':'support','confidence':'confidence'},inplace =
4 True)
5 rules = rules[['from','to','support','confidence','lift']]
6 print('以下为联合使用两种指标的关联规则')
7 rules
```

```
1  |  以下为联合使用两种指标的关联规则
```

```
1 .dataframe tbody tr th {
2     vertical-align: top;
3 }
4
5 .dataframe thead th {
6     text-align: right;
7 }
```



	from	to	support	confidence	lift
698	(992, 639, 720)	(335, 331)	0.00121	1.0	781.250000
701	(639, 720, 509)	(335, 331)	0.00121	1.0	781.250000
705	(992, 639, 720, 509)	(335, 331)	0.00120	1.0	781.250000
713	(992, 720, 509)	(335, 331)	0.00122	1.0	781.250000
810	(351, 268, 841)	(545)	0.00117	1.0	840.336134
813	(268, 841, 606)	(545)	0.00117	1.0	840.336134
816	(351, 841, 606)	(545)	0.00116	1.0	840.336134
818	(351, 268, 841, 606)	(545)	0.00116	1.0	840.336134
819	(351, 841, 606)	(268, 545)	0.00116	1.0	840.336134
821	(72, 268, 606)	(545)	0.00117	1.0	840.336134
823	(72, 268, 841)	(545)	0.00117	1.0	840.336134
826	(72, 268, 841, 606)	(545)	0.00116	1.0	840.336134
828	(351, 72, 841)	(545)	0.00116	1.0	840.336134
830	(351, 72, 268, 841)	(545)	0.00116	1.0	840.336134
831	(351, 72, 841)	(268, 545)	0.00116	1.0	840.336134
833	(351, 72, 268, 606)	(545)	0.00116	1.0	840.336134
834	(351, 72, 841, 606)	(545)	0.00115	1.0	840.336134
836	(841, 606, 72, 268, 351)	(545)	0.00115	1.0	840.336134
837	(351, 72, 841, 606)	(268, 545)	0.00115	1.0	840.336134
839	(72, 749, 268)	(545)	0.00116	1.0	840.336134
841	(749, 268, 606)	(545)	0.00116	1.0	840.336134
844	(72, 749, 268, 606)	(545)	0.00115	1.0	840.336134
845	(749, 841, 268)	(545)	0.00116	1.0	840.336134
847	(749, 841, 606)	(545)	0.00115	1.0	840.336134
849	(268, 841, 749, 606)	(545)	0.00115	1.0	840.336134
850	(749, 841, 606)	(268, 545)	0.00115	1.0	840.336134
852	(72, 268, 841, 749)	(545)	0.00115	1.0	840.336134
853	(72, 749, 841, 606)	(545)	0.00114	1.0	840.336134
855	(841, 606, 72, 268, 749)	(545)	0.00114	1.0	840.336134
856	(72, 749, 841, 606)	(268, 545)	0.00114	1.0	840.336134
857	(351, 749, 268)	(545)	0.00116	1.0	840.336134
859	(351, 749, 841)	(545)	0.00115	1.0	840.336134
860	(351, 749, 606)	(545)	0.00115	1.0	840.336134
861	(351, 72, 749)	(545)	0.00115	1.0	840.336134
863	(351, 268, 841, 749)	(545)	0.00115	1.0	840.336134
864	(351, 749, 841)	(268, 545)	0.00115	1.0	840.336134
866	(351, 749, 268, 606)	(545)	0.00115	1.0	840.336134
867	(351, 749, 606)	(268, 545)	0.00115	1.0	840.336134
868	(351, 749, 841, 606)	(545)	0.00114	1.0	840.336134
870	(841, 606, 268, 351, 749)	(545)	0.00114	1.0	840.336134
871	(351, 749, 841, 606)	(268, 545)	0.00114	1.0	840.336134

	from	to	support	confidence	lift
873	(351, 72, 749, 268)	(545)	0.00115	1.0	840.336134
874	(351, 72, 749)	(268, 545)	0.00115	1.0	840.336134
875	(351, 72, 749, 606)	(545)	0.00114	1.0	840.336134
876	(351, 72, 749, 841)	(545)	0.00114	1.0	840.336134
878	(606, 72, 268, 351, 749)	(545)	0.00114	1.0	840.336134
879	(351, 72, 749, 606)	(268, 545)	0.00114	1.0	840.336134
881	(841, 72, 268, 351, 749)	(545)	0.00114	1.0	840.336134
882	(351, 72, 749, 841)	(268, 545)	0.00114	1.0	840.336134
883	(841, 606, 72, 351, 749)	(545)	0.00113	1.0	840.336134
885	(841, 606, 72, 268, 351, 749)	(545)	0.00113	1.0	840.336134
886	(841, 606, 72, 351, 749)	(268, 545)	0.00113	1.0	840.336134