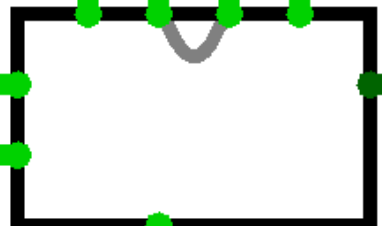


Binvert/Cin

OP1

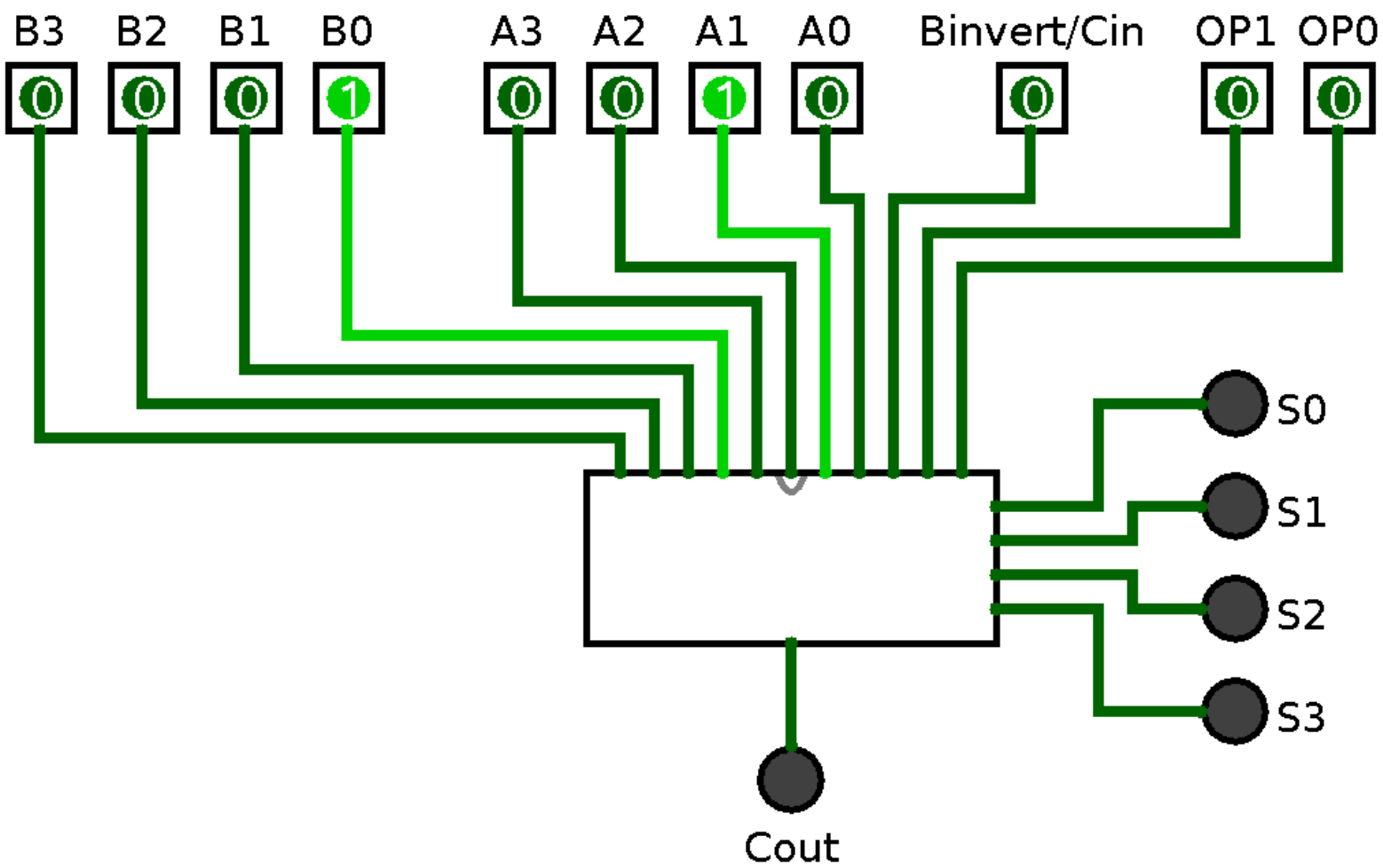
OP0

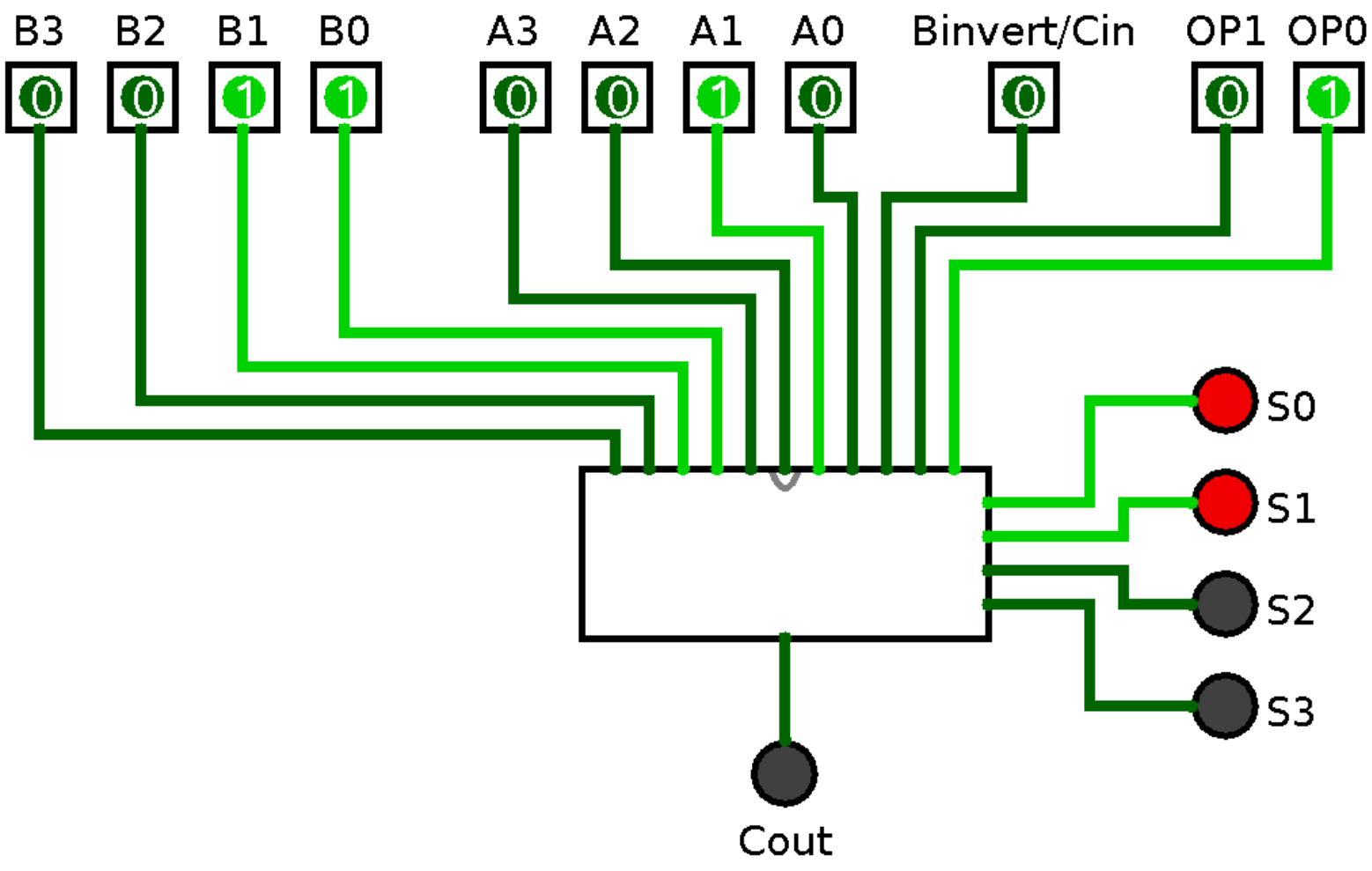


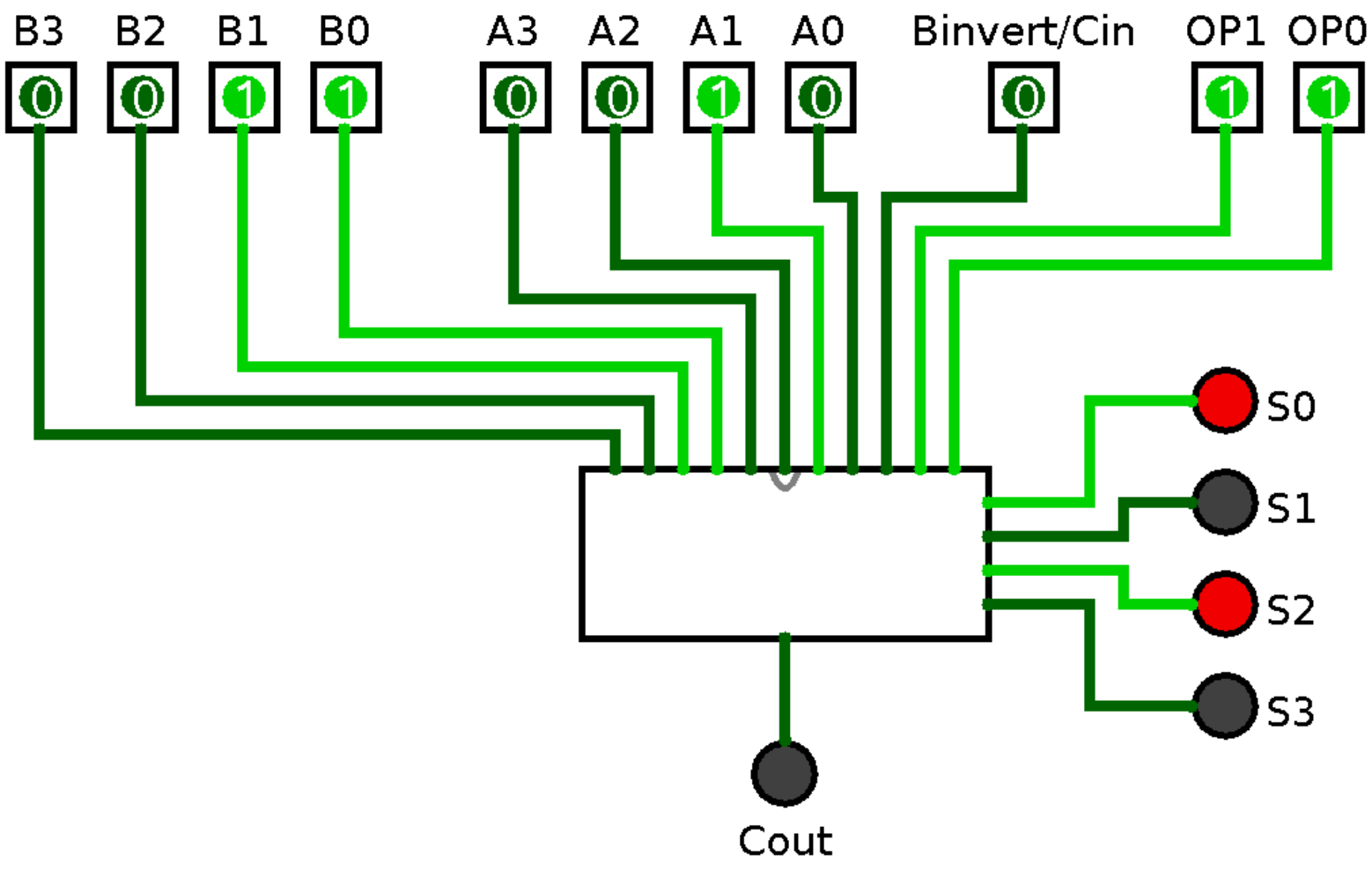
S0

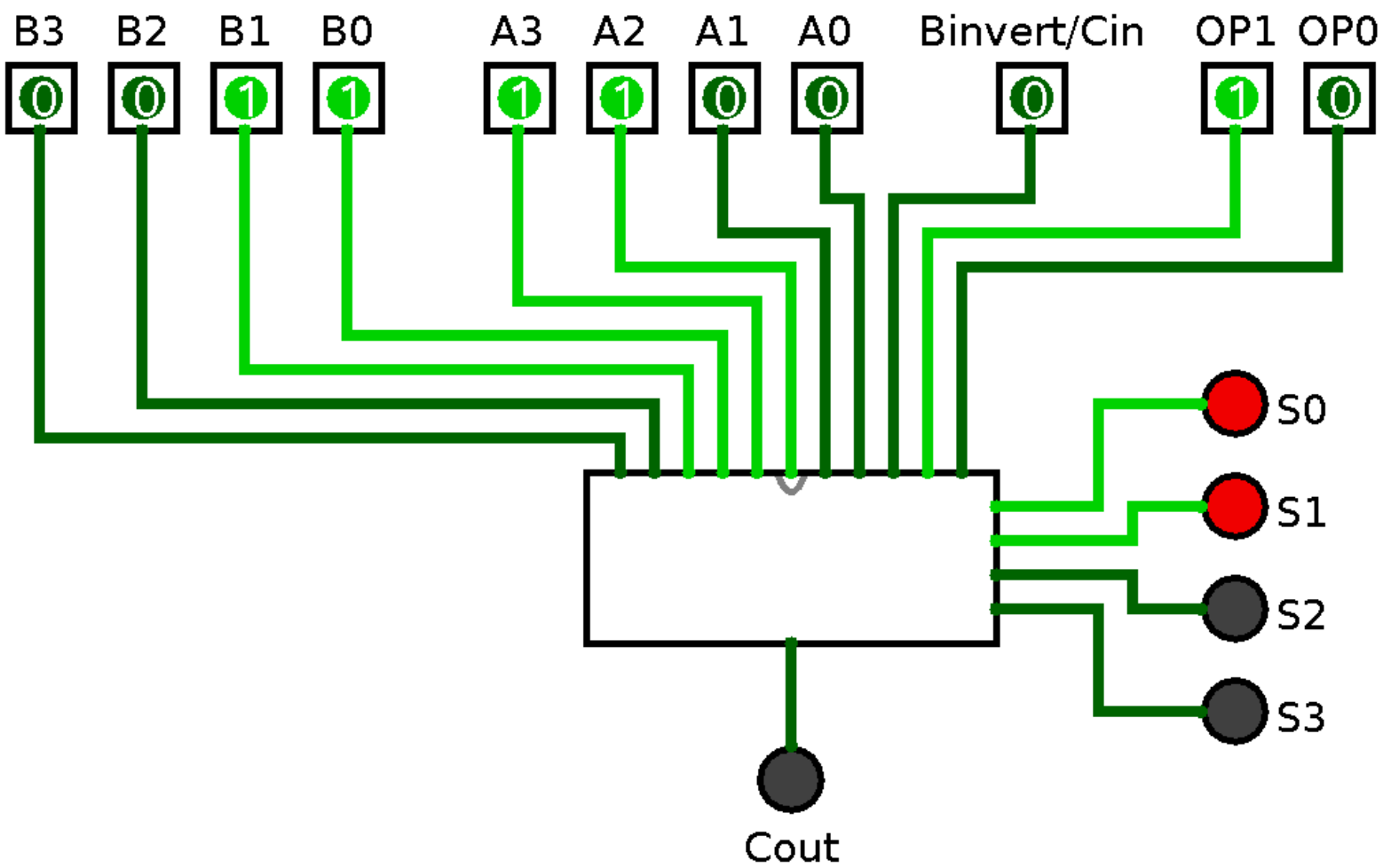


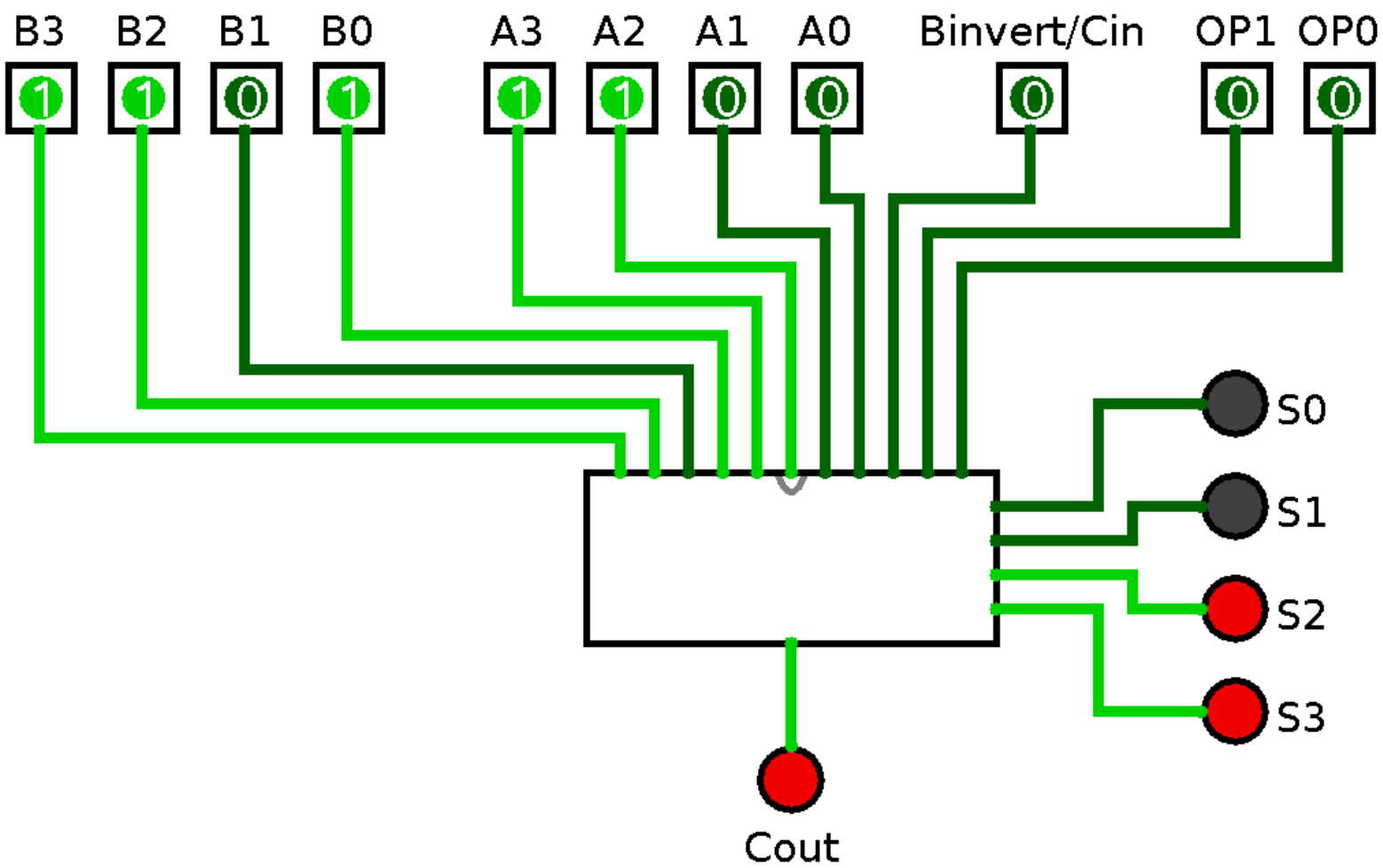
Cout



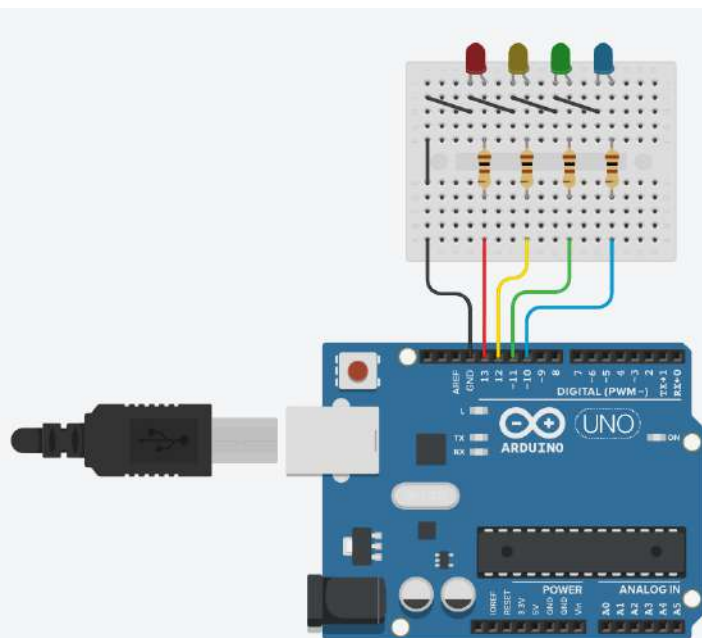






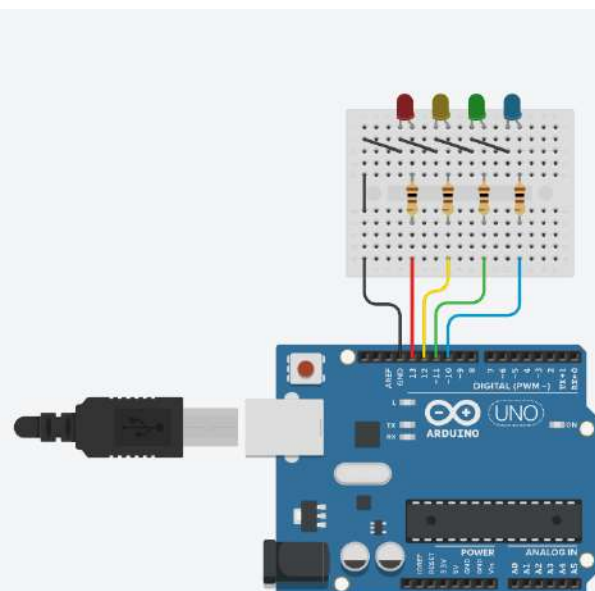


Instrução realizada	Binário (A,B,Op.code)	Valor em Hexa (0x...)	Resultado em binário
AND(A,B)	0010 0001 00	(0000 1000 0100) = 0x084	0000
OR(A,B)	0010 0011 01	(0000 1000 1101) = 0x08d	0011
SOMA(A,B)	0010 0011 11	(0000 1000 1111) = 0x08f	0101
NOT(A)	1100 0011 10	(0011 0000 1110) = 0x30e	0011
AND(A,B)	1100 1101 00	(0011 0011 0100) = 0x334	1100



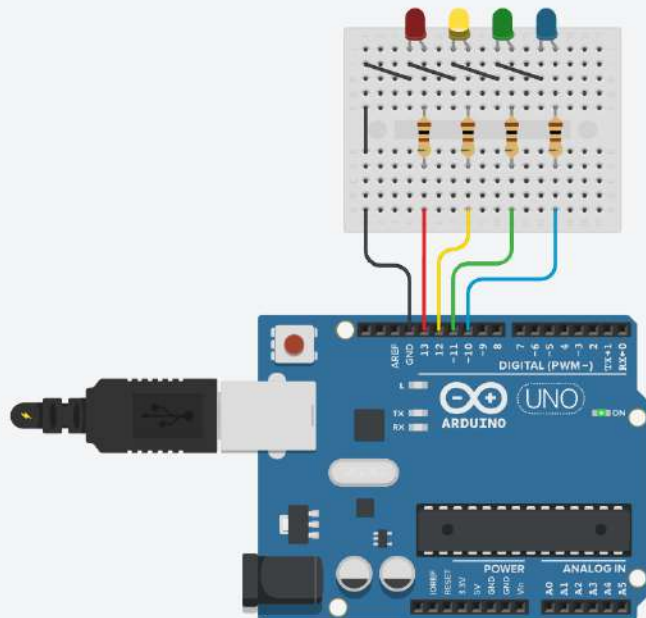
```
1 // C++ code
2 //
3
4 int pulse, led;
5
6 void setup()
7 {
8   pinMode(10, OUTPUT);
9   pinMode(11, OUTPUT);
10  pinMode(12, OUTPUT);
11  pinMode(13, OUTPUT);
12  digitalWrite(10, LOW);
13  digitalWrite(11, LOW);
14  digitalWrite(12, LOW);
15  digitalWrite(13, HIGH);
16  pulse = 0;
17  led = 0;
18  delay(200); // 0,2 segundo
19 }
20
21 void loop()
22 {
23   // Pulso do led azul
24   pulse = (pulse + 1) % 9;
25   delay(800); // 0,8 segundo
26   digitalWrite(10, HIGH);
27   // Controle dos pulsos
28   if (pulse < 3) // 3 segundos (3 pulsos)
29   {
30     led = 0;
31   }
32   else if (pulse < 7) // 4 segundos (4 pulsos)
33   {
34     led = 1;
35   }
36   else // 2 segundos (2 pulsos)
37   {
38     led = 2;
39   }
40   // Controle dos leds
41   if (led == 0)
42   {
43     digitalWrite(11, LOW);
44     digitalWrite(12, LOW);
45     digitalWrite(13, HIGH);
46   }
47   else if (led == 1)
48   {
49     digitalWrite(11, HIGH);
50     digitalWrite(12, LOW);
51     digitalWrite(13, LOW);
52   }
53   else
54   {
55     digitalWrite(11, LOW);
56     digitalWrite(12, HIGH);
57     digitalWrite(13, LOW);
58   }
59   delay(200); // 0,2 segundo
60   digitalWrite(10, LOW);
61 }
```

Monitor serial



```
1 // C++ code
2 //
3
4 int entrada = 0,
5 A = 0,
6 B = 0,
7 OP = 0,
8 saida = 0,
9 vai1 = 0;
10
11 void setup()
12 {
13     Serial.begin(9600);
14     pinMode(10, OUTPUT);
15     pinMode(11, OUTPUT);
16     pinMode(12, OUTPUT);
17     pinMode(13, OUTPUT);
18     digitalWrite(10, LOW);
19     digitalWrite(11, LOW);
20     digitalWrite(12, LOW);
21     digitalWrite(13, LOW);
22 }
23
24 void loop()
25 {
26     if (Serial.available() > 0)
27     {
28         entrada = Serial.parseInt();
29         A = (entrada / 100) % 10; // Centena
30         B = (entrada / 10) % 10; // Dezena
31         OP = entrada % 10; // Unidade
32         vai1 = 0;
33         switch (OP)
34         {
35             case 0:
36                 saida = portaand();
37                 break;
38             case 1:
39                 saida = portaor();
40                 break;
41             case 2:
42                 saida = portanot();
43                 break;
44             case 3:
45                 saida = portasoma();
46                 break;
47             default:
48                 break;
49         }
50         mostrar();
51     }
52 }
53
54 void mostrar()
55 {
56     apagar();
57     digitalWrite(10, vai1);
58     digitalWrite(11, saida);
59     digitalWrite(12, B);
60     digitalWrite(13, A);
61 }
62
63 int portaand()
64 {
65     return (A & B);
66 }
67
68 int portaor()
69 {
70     return (A | B);
71 }
72
73 /*
74  ** O comando "& 0x1" é uma maneira de analisar
75  ** o 1 bit relevante e retornar o valor negado
76  */
77 int portanot()
78 {
79     return ~A & 0x1;
80 }
81
82 int portasoma()
83 {
84     vai1 = (A + B) / 2;
85     return ((A + B) % 2);
86 }
87
88 void apagar()
89 {
90     digitalWrite(10, LOW);
91     digitalWrite(11, LOW);
92     digitalWrite(12, LOW);
93     digitalWrite(13, LOW);
94 }
```

Monitor serial



```
1 // C++ code
2 //
3
4 int entrada = 0,
5     A = 0,
6     B = 0,
7     OP = 0,
8     saida = 0,
9     vail = 0;
10
11 void setup()
12 {
13     Serial.begin(9600);
14     pinMode(10, OUTPUT);
15     pinMode(11, OUTPUT);
16     pinMode(12, OUTPUT);
17     pinMode(13, OUTPUT);
18     digitalWrite(10, LOW);
19     digitalWrite(11, LOW);
20     digitalWrite(12, LOW);
21     digitalWrite(13, LOW);
22 }
23
24 void loop()
25 {
26     if (Serial.available() > 0)
27     {
28         entrada = Serial.parseInt();
29         A = (entrada / 100) % 10; // Centena
30         B = (entrada / 10) % 10; // Dezena
31         OP = entrada % 10; // Unidade
32         vail = 0;
33         switch (OP)
34         {
35             case 0:
36                 saida = portaand();
37                 break;
38             case 1:
39                 saida = portaoxor();
40                 break;
41             case 2:
42                 saida = portaoir();
43                 break;
44             case 3:
45                 saida = portaoor();
46                 break;
47             case 4:
48                 saida = portaoand();
49                 break;
50             case 5:
51                 saida = portaoxor();
52                 break;
53             case 6:
54                 saida = portaoir();
55                 break;
56             case 7:
57                 saida = portaoor();
58                 break;
59             case 8:
60                 saida = portaoand();
61                 break;
62             case 9:
63                 saida = portaoxor();
64                 break;
65             case 10:
66                 saida = portaoir();
67                 break;
68             case 11:
69                 saida = portaoor();
70                 break;
71             case 12:
72                 saida = portaoand();
73                 break;
74             case 13:
75                 saida = portaoxor();
76                 break;
77             case 14:
78                 saida = portaoir();
79                 break;
80             case 15:
81                 saida = portaoor();
82                 break;
83         }
84         Serial.print(saida);
85         Serial.print("\n");
86     }
87 }
```

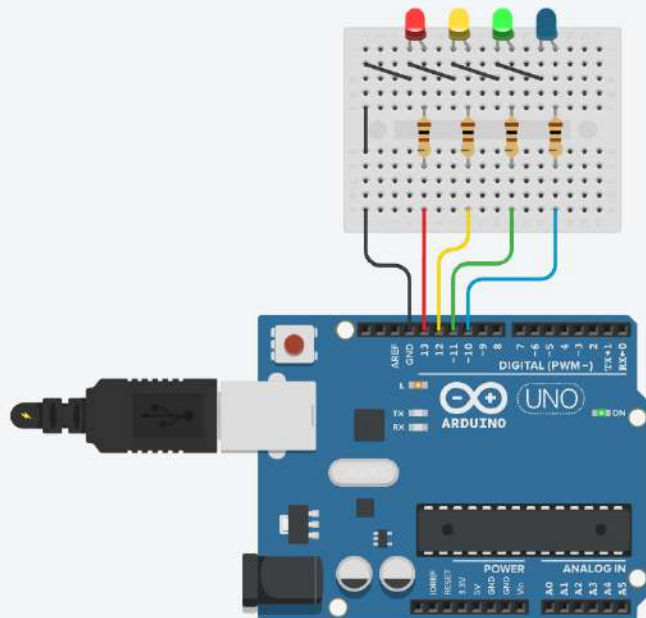
Monitor serial

010]

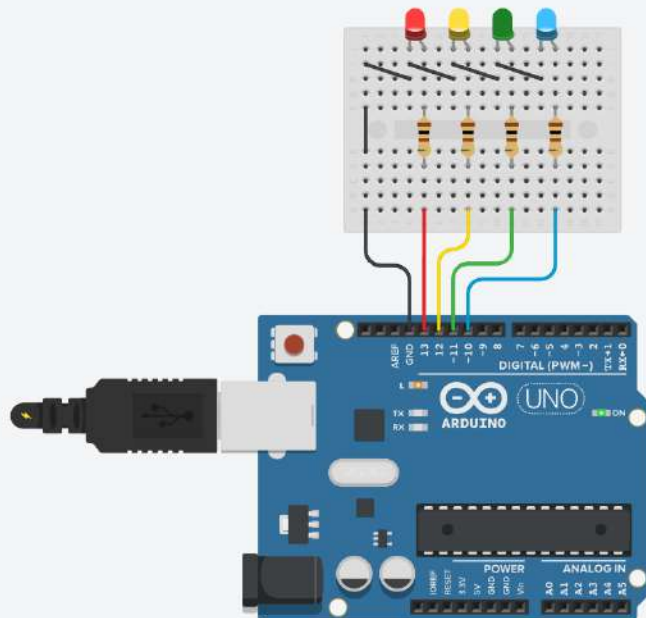
Env.

Apag.

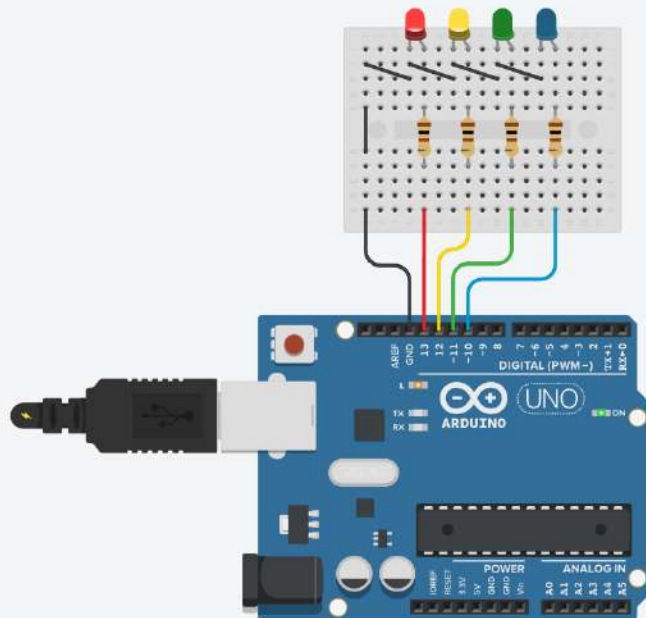
AV



```
1 // C++ code
2 //
3
4 int entrada = 0,
5     A = 0,
6     B = 0,
7     OP = 0,
8     saida = 0,
9     vail = 0;
10
11 void setup()
12 {
13     Serial.begin(9600);
14     pinMode(10, OUTPUT);
15     pinMode(11, OUTPUT);
16     pinMode(12, OUTPUT);
17     pinMode(13, OUTPUT);
18     digitalWrite(10, LOW);
19     digitalWrite(11, LOW);
20     digitalWrite(12, LOW);
21     digitalWrite(13, LOW);
22 }
23
24 void loop()
25 {
26     if (Serial.available() > 0)
27     {
28         entrada = Serial.parseInt();
29         A = (entrada / 100) % 10; // Centena
30         B = (entrada / 10) % 10; // Dezena
31         OP = entrada % 10; // Unidade
32         vail = 0;
33         switch (OP)
34         {
35             case 0:
36                 saida = portaand();
37                 break;
38             case 1:
39                 saida = portaoxor();
40                 break;
41             case 2:
42                 saida = portaoir();
43                 break;
44             case 3:
45                 saida = portaoor();
46                 break;
47             case 4:
48                 saida = portaoand();
49                 break;
50             case 5:
51                 saida = portaoxor();
52                 break;
53             case 6:
54                 saida = portaoir();
55                 break;
56             case 7:
57                 saida = portaoor();
58                 break;
59             case 8:
60                 saida = portaoand();
61                 break;
62             case 9:
63                 saida = portaoxor();
64                 break;
65             case 10:
66                 saida = portaoir();
67                 break;
68             case 11:
69                 saida = portaoor();
70                 break;
71             case 12:
72                 saida = portaoand();
73                 break;
74             case 13:
75                 saida = portaoxor();
76                 break;
77             case 14:
78                 saida = portaoir();
79                 break;
80             case 15:
81                 saida = portaoor();
82                 break;
83             case 16:
84                 saida = portaoand();
85                 break;
86             case 17:
87                 saida = portaoxor();
88                 break;
89             case 18:
90                 saida = portaoir();
91                 break;
92             case 19:
93                 saida = portaoor();
94                 break;
95             case 20:
96                 saida = portaoand();
97                 break;
98             case 21:
99                 saida = portaoxor();
100                break;
101            case 22:
102                saida = portaoir();
103                break;
104            case 23:
105                saida = portaoor();
106                break;
107            case 24:
108                saida = portaoand();
109                break;
110            case 25:
111                saida = portaoxor();
112                break;
113            case 26:
114                saida = portaoir();
115                break;
116            case 27:
117                saida = portaoor();
118                break;
119            case 28:
120                saida = portaoand();
121                break;
122            case 29:
123                saida = portaoxor();
124                break;
125            case 30:
126                saida = portaoir();
127                break;
128            case 31:
129                saida = portaoor();
130                break;
131            case 32:
132                saida = portaoand();
133                break;
134            case 33:
135                saida = portaoxor();
136                break;
137            case 34:
138                saida = portaoir();
139                break;
140            case 35:
141                saida = portaoor();
142                break;
143            case 36:
144                saida = portaoand();
145                break;
146            case 37:
147                saida = portaoxor();
148                break;
149            case 38:
150                saida = portaoir();
151                break;
152            case 39:
153                saida = portaoor();
154                break;
155            case 40:
156                saida = portaoand();
157                break;
158            case 41:
159                saida = portaoxor();
160                break;
161            case 42:
162                saida = portaoir();
163                break;
164            case 43:
165                saida = portaoor();
166                break;
167            case 44:
168                saida = portaoand();
169                break;
170            case 45:
171                saida = portaoxor();
172                break;
173            case 46:
174                saida = portaoir();
175                break;
176            case 47:
177                saida = portaoor();
178                break;
179            case 48:
180                saida = portaoand();
181                break;
182            case 49:
183                saida = portaoxor();
184                break;
185            case 50:
186                saida = portaoir();
187                break;
188            case 51:
189                saida = portaoor();
190                break;
191            case 52:
192                saida = portaoand();
193                break;
194            case 53:
195                saida = portaoxor();
196                break;
197            case 54:
198                saida = portaoir();
199                break;
200            case 55:
201                saida = portaoor();
202                break;
203            case 56:
204                saida = portaoand();
205                break;
206            case 57:
207                saida = portaoxor();
208                break;
209            case 58:
210                saida = portaoir();
211                break;
212            case 59:
213                saida = portaoor();
214                break;
215            case 60:
216                saida = portaoand();
217                break;
218            case 61:
219                saida = portaoxor();
220                break;
221            case 62:
222                saida = portaoir();
223                break;
224            case 63:
225                saida = portaoor();
226                break;
227            case 64:
228                saida = portaoand();
229                break;
230            case 65:
231                saida = portaoxor();
232                break;
233            case 66:
234                saida = portaoir();
235                break;
236            case 67:
237                saida = portaoor();
238                break;
239            case 68:
240                saida = portaoand();
241                break;
242            case 69:
243                saida = portaoxor();
244                break;
245            case 70:
246                saida = portaoir();
247                break;
248            case 71:
249                saida = portaoor();
250                break;
251            case 72:
252                saida = portaoand();
253                break;
254            case 73:
255                saida = portaoxor();
256                break;
257            case 74:
258                saida = portaoir();
259                break;
260            case 75:
261                saida = portaoor();
262                break;
263            case 76:
264                saida = portaoand();
265                break;
266            case 77:
267                saida = portaoxor();
268                break;
269            case 78:
270                saida = portaoir();
271                break;
272            case 79:
273                saida = portaoor();
274                break;
275            case 80:
276                saida = portaoand();
277                break;
278            case 81:
279                saida = portaoxor();
280                break;
281            case 82:
282                saida = portaoir();
283                break;
284            case 83:
285                saida = portaoor();
286                break;
287            case 84:
288                saida = portaoand();
289                break;
290            case 85:
291                saida = portaoxor();
292                break;
293            case 86:
294                saida = portaoir();
295                break;
296            case 87:
297                saida = portaoor();
298                break;
299            case 88:
300                saida = portaoand();
301                break;
302            case 89:
303                saida = portaoxor();
304                break;
305            case 90:
306                saida = portaoir();
307                break;
308            case 91:
309                saida = portaoor();
310                break;
311            case 92:
312                saida = portaoand();
313                break;
314            case 93:
315                saida = portaoxor();
316                break;
317            case 94:
318                saida = portaoir();
319                break;
320            case 95:
321                saida = portaoor();
322                break;
323            case 96:
324                saida = portaoand();
325                break;
326            case 97:
327                saida = portaoxor();
328                break;
329            case 98:
330                saida = portaoir();
331                break;
332            case 99:
333                saida = portaoor();
334                break;
335            case 100:
336                saida = portaoand();
337                break;
338            case 101:
339                saida = portaoxor();
340                break;
341            case 102:
342                saida = portaoir();
343                break;
344            case 103:
345                saida = portaoor();
346                break;
347            case 104:
348                saida = portaoand();
349                break;
350            case 105:
351                saida = portaoxor();
352                break;
353            case 106:
354                saida = portaoir();
355                break;
356            case 107:
357                saida = portaoor();
358                break;
359            case 108:
360                saida = portaoand();
361                break;
362            case 109:
363                saida = portaoxor();
364                break;
365            case 110:
366                saida = portaoir();
367                break;
368            case 111:
369                saida = portaoor();
370                break;
371            case 112:
372                saida = portaoand();
373                break;
374            case 113:
375                saida = portaoxor();
376                break;
377            case 114:
378                saida = portaoir();
379                break;
380            case 115:
381                saida = portaoor();
382                break;
383            case 116:
384                saida = portaoand();
385                break;
386            case 117:
387                saida = portaoxor();
388                break;
389            case 118:
390                saida = portaoir();
391                break;
392            case 119:
393                saida = portaoor();
394                break;
395            case 120:
396                saida = portaoand();
397                break;
398            case 121:
399                saida = portaoxor();
400                break;
401            case 122:
402                saida = portaoir();
403                break;
404            case 123:
405                saida = portaoor();
406                break;
407            case 124:
408                saida = portaoand();
409                break;
410            case 125:
411                saida = portaoxor();
412                break;
413            case 126:
414                saida = portaoir();
415                break;
416            case 127:
417                saida = portaoor();
418                break;
419            case 128:
420                saida = portaoand();
421                break;
422            case 129:
423                saida = portaoxor();
424                break;
425            case 130:
426                saida = portaoir();
427                break;
428            case 131:
429                saida = portaoor();
430                break;
431            case 132:
432                saida = portaoand();
433                break;
434            case 133:
435                saida = portaoxor();
436                break;
437            case 134:
438                saida = portaoir();
439                break;
440            case 135:
441                saida = portaoor();
442                break;
443            case 136:
444                saida = portaoand();
445                break;
446            case 137:
447                saida = portaoxor();
448                break;
449            case 138:
450                saida = portaoir();
451                break;
452            case 139:
453                saida = portaoor();
454                break;
455            case 140:
456                saida = portaoand();
457                break;
458            case 141:
459                saida = portaoxor();
460                break;
461            case 142:
462                saida = portaoir();
463                break;
464            case 143:
465                saida = portaoor();
466                break;
467            case 144:
468                saida = portaoand();
469                break;
470            case 145:
471                saida = portaoxor();
472                break;
473            case 146:
474                saida = portaoir();
475                break;
476            case 147:
477                saida = portaoor();
478                break;
479            case 148:
480                saida = portaoand();
481                break;
482            case 149:
483                saida = portaoxor();
484                break;
485            case 150:
486                saida = portaoir();
487                break;
488            case 151:
489                saida = portaoor();
490                break;
491            case 152:
492                saida = portaoand();
493                break;
494            case 153:
495                saida = portaoxor();
496                break;
497            case 154:
498                saida = portaoir();
499                break;
500            case 155:
501                saida = portaoor();
502                break;
503            case 156:
504                saida = portaoand();
505                break;
506            case 157:
507                saida = portaoxor();
508                break;
509            case 158:
510                saida = portaoir();
511                break;
512            case 159:
513                saida = portaoor();
514                break;
515            case 160:
516                saida = portaoand();
517                break;
518            case 161:
519                saida = portaoxor();
520                break;
521            case 162:
522                saida = portaoir();
523                break;
524            case 163:
525                saida = portaoor();
526                break;
527            case 164:
528                saida = portaoand();
529                break;
530            case 165:
531                saida = portaoxor();
532                break;
533            case 166:
534                saida = portaoir();
535                break;
536            case 167:
537                saida = portaoor();
538                break;
539            case 168:
540                saida = portaoand();
541                break;
542            case 169:
543                saida = portaoxor();
544                break;
545            case 170:
546                saida = portaoir();
547                break;
548            case 171:
549                saida = portaoor();
550                break;
551            case 172:
552                saida = portaoand();
553                break;
554            case 173:
555                saida = portaoxor();
556                break;
557            case 174:
558                saida = portaoir();
559                break;
560            case 175:
561                saida = portaoor();
562                break;
563            case 176:
564                saida = portaoand();
565                break;
566            case 177:
567                saida = portaoxor();
568                break;
569            case 178:
570                saida = portaoir();
571                break;
572            case 179:
573                saida = portaoor();
574                break;
575            case 180:
576                saida = portaoand();
577                break;
578            case 181:
579                saida = portaoxor();
580                break;
581            case 182:
582                saida = portaoir();
583                break;
584            case 183:
585                saida = portaoor();
586                break;
587            case 184:
588                saida = portaoand();
589                break;
590            case 185:
591                saida = portaoxor();
592                break;
593            case 186:
594                saida = portaoir();
595                break;
596            case 187:
597                saida = portaoor();
598                break;
599            case 188:
600                saida = portaoand();
601                break;
602            case 189:
603                saida = portaoxor();
604                break;
605            case 190:
606                saida = portaoir();
607                break;
608            case 191:
609                saida = portaoor();
610                break;
611            case 192:
612                saida = portaoand();
613                break;
614            case 193:
615                saida = portaoxor();
616                break;
617            case 194:
618                saida = portaoir();
619                break;
620            case 195:
621                saida = portaoor();
622                break;
623            case 196:
624                saida = portaoand();
625                break;
626            case 197:
627                saida = portaoxor();
628                break;
629            case 198:
630                saida = portaoir();
631                break;
632            case 199:
633                saida = portaoor();
634                break;
635            case 200:
636                saida = portaoand();
637                break;
638            case 201:
639                saida = portaoxor();
640                break;
641            case 202:
642                saida = portaoir();
643                break;
644            case 203:
645                saida = portaoor();
646                break;
647            case 204:
648                saida = portaoand();
649                break;
650            case 205:
651                saida = portaoxor();
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653            case 206:
654                saida = portaoir();
655                break;
656            case 207:
657                saida = portaoor();
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659            case 208:
660                saida = portaoand();
661                break;
662            case 209:
663                saida = portaoxor();
664                break;
665            case 210:
666                saida = portaoir();
667                break;
668            case 211:
669                saida = portaoor();
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671            case 212:
672                saida = portaoand();
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674            case 213:
675                saida = portaoxor();
676                break;
677            case 214:
678                saida = portaoir();
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680            case 215:
681                saida = portaoor();
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683            case 216:
684                saida = portaoand();
685                break;
686            case 217:
687                saida = portaoxor();
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689            case 218:
690                saida = portaoir();
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693                saida = portaoor();
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696                saida = portaoand();
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698            case 221:
699                saida = portaoxor();
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701            case 222:
702                saida = portaoir();
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704            case 223:
705                saida = portaoor();
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707            case 224:
708                saida = portaoand();
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710            case 225:
711                saida = portaoxor();
712                break;
713            case 226:
714                saida = portaoir();
715                break;
716            case 227:
717                saida = portaoor();
718                break;
719            case 228:
720                saida = portaoand();
721                break;
722            case 229:
723                saida = portaoxor();
724                break;
725            case 230:
726                saida = portaoir();
727                break;
728            case 231:
729                saida = portaoor();
730                break;
731            case 232:
732                saida = portaoand();
733                break;
734            case 233:
735                saida = portaoxor();
736                break;
737            case 234:
738                saida = portaoir();
739                break;
740            case 235:
741                saida = portaoor();
742                break;
743            case 236:
744                saida = portaoand();
745                break;
746            case 237:
747                saida = portaoxor();
748                break;
749            case 238:
750                saida = portaoir();
751                break;
752            case 239:
753                saida = portaoor();
754                break;
755            case 240:
756                saida = portaoand();
757                break;
758            case 241:
759                saida = portaoxor();
760                break;
761            case 242:
762                saida = portaoir();
763                break;
764            case 243:
765                saida = portaoor();
766                break;
767            case 244:
768                saida = portaoand();
769                break;
770            case 245:
771                saida = portaoxor();
772                break;
773            case 246:
774                saida = portaoir();
775                break;
776            case 247:
777                saida = portaoor();
778                break;
779            case 248:
780                saida = portaoand();
781                break;
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783                saida = portaoxor();
784                break;
785            case 250:
786                saida = portaoir();
787                break;
788            case 251:
789                saida = portaoor();
790                break;
791            case 252:
792                saida = portaoand();
793                break;
794            case 253:
795                saida = portaoxor();
796                break;
797            case 254:
798                saida = portaoir();
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800            case 255:
801                saida = portaoor();
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803            case 256:
804                saida = portaoand();
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806            case 257:
807                saida = portaoxor();
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809            case 258:
810                saida = portaoir();
811                break;
812            case 259:
813                saida = portaoor();
814                break;
815            case 260:
816                saida = portaoand();
817                break;
818            case 261:
819                saida = portaoxor();
820                break;
821            case 262:
822                saida = portaoir();
823                break;
824            case 263:
825                saida = portaoor();
826                break;
827            case 264:
828                saida = portaoand();
829                break;
830            case 265:
831                saida = portaoxor();
832                break;
833            case 266:
834                saida = portaoir();
835                break;
836            case 267:
837                saida = portaoor();
838                break;
839            case 268:
840                saida = portaoand();
841                break;
842            case 269:
843                saida = portaoxor();
844                break;
845            case 270:
846                saida = portaoir();
847                break;
848            case 271:
849                saida = portaoor();
850                break;
851            case 272:
852                saida = portaoand();
853                break;
854            case 273:
855                saida = portaoxor();
856                break;
857            case 274:
858                saida = portaoir();
859                break;
860            case 275:
861                saida = portaoor();
862                break;
863            case 276:
864                saida = portaoand();
865                break;
866            case 277:
867                saida = portaoxor();
868                break;
869            case 278:
870                saida = portaoir();
871                break;
872            case 279:
873                saida = portaoor();
874                break;
875            case 280:
876                saida = portaoand();
877                break;
878            case 281:
879                saida = portaoxor();
880                break;
881            case 282:
882                saida = portaoir();
883                break;
884            case 283:
885                saida = portaoor();
886                break;
887            case 284:
888                saida = portaoand();
889                break;
890            case 285:
891                saida = portaoxor();
892                break;
893            case 286:
894                saida = portaoir();
895                break;
896            case 287:
897                saida = portaoor();
898                break;
899            case 288:
900                saida = portaoand();
901                break;
902            case 289:
903                saida = portaoxor();
904                break;
905            case 290:
906                saida = portaoir();
907                break;
908            case 291:
909                saida = portaoor();
910                break;
911            case 292:
912                saida = portaoand();
913                break;
914            case 293:
915                saida = portaoxor();
916                break;
917            case 294:
918                saida = portaoir();
919                break;
920            case 295:
921                saida = portaoor();
922                break;
923            case 296:
924                saida = portaoand();
925                break;
926            case 297:
927                saida = portaoxor();
928                break;
929            case 298:
930                saida = portaoir();
931                break;
932            case 299:
933                saida = portaoor();
934                break;
935            case 300:
936                saida = portaoand();
937                break;
938            case 301:
939                saida = portaoxor();
940                break;
941            case 302:
942                saida = portaoir();
943                break;
944            case 303:
945                saida = portaoor();
946                break;
947            case 304:
948                saida = portaoand();
949                break;
950            case 305:
951                saida = portaoxor();
952                break;
953            case 306:
954                saida = portaoir();
955                break;
956            case 307:
957                saida = portaoor();
958                break;
959            case 308:
960                saida = portaoand();
961                break;
962            case 309:
963                saida = portaoxor();
964                break;
965            case 310:
966                saida = portaoir();
967                break;
968            case 311:
969                saida = portaoor();
970                break;
971            case 312:
972                saida = portaoand();
973                break;
974            case 313:
975                saida = portaoxor();
976                break;
977            case 314:
978                saida = portaoir();
979                break;
980            case 315:
981                saida = portaoor();
982                break;
983            case 316:
984                saida = portaoand();
985                break;
986            case 317:
987                saida = portaoxor();
988                break;
989            case 318:
990                saida = portaoir();
991                break;
992            case 319:
993                saida = portaoor();
994                break;
995            case 320:
996                saida = portaoand();
997                break;
998            case 321:
999                saida = portaoxor();
1000               break;
1001            case 322:
1002                saida = portaoir();
1003                break;
1004            case 323:
1005                saida = portaoor();
1006                break;
1007            case 324:
1008                saida = portaoand();
1009                break;
1010            case 325:
1011                saida = portaoxor();
1012                break;
1013            case 326:
1014                saida = portaoir();
1015                break;
1016            case 327:
1017                saida = portaoor();
1018                break;
1019            case 328:
1020                saida = portaoand();
1021                break;
1022            case 329:
1023                saida = portaoxor();
1024                break;
1025            case 330:
1026                saida = portaoir();
1027                break;
1028            case 331:
1029                saida = portaoor();
1030                break;
1031            case 332:
1032                saida = portaoand();
1033                break;
1034            case 333:
1035                saida = portaoxor();
1036                break;
1037            case 334:
1038                saida = portaoir();
1039                break;
1040            case 335:
1041                saida = portaoor();
1042                break;
1043            case 336:
1044                saida = portaoand();
1045                break;
1046            case 337:
1047                saida = portaoxor();
1048                break;
1049            case 338:
1050                saida = portaoir();
1051                break;
1052            case 339:
1053                saida = portaoor();
1054                break;
1055            case 340:
1056                saida = portaoand();
1057                break;
1058            case 341:
1059                saida = portaoxor();
1060                break;
1061            case 342:
1062                saida = portaoir();
1063                break;
1064            case 343:
1065                saida = portaoor();
1066                break;
1067            case 344:
1068                saida = portaoand();
1069                break;
1070            case 345:
1071                saida = portaoxor();
1072                break;
1073            case 346:
1074                saida = portaoir();
1075                break;
1076            case 347:
1077                saida = portaoor();
1078                break;
1079            case 348:
1080                saida = portaoand();
1081                break;
1082            case 349:
1083                saida = portaoxor();
1084                break;
1085            case 350:
1086                saida = portaoir();
1087                break;
1088            case 351:
1089                saida = portaoor();
1090                break;
1091            case 352:
1092                saida = portaoand();
1093                break;
1094            case 353:
1095                saida = portaoxor();
1096                break;
1097            case 354:
1098                saida = portaoir();
1099                break;
1100            case 355:
1101                saida = portaoor();
1102                break;
1103            case 356:
1104                saida = portaoand();
1105                break;
1106            case 357:
1107                saida = portaoxor();
1108                break;
1109            case 358:
1110                saida = portaoir();
1111                break;
1112            case 359:
1113                saida = portaoor();
1114                break;
1115            case 360:
1116                saida = portaoand();
1117                break;
1118            case 361:
1119                saida = portaoxor();
1120                break;
1121            case 362:
1122                saida = portaoir();
1123                break;
1124            case 363:
1125                saida = portaoor();
1126                break;
1127            case 364:
1128                saida = portaoand();
1129                break;
1130            case 365:
1131                saida = portaoxor();
1132                break;
1133            case 366:
1134                saida = portaoir();
1135                break;
1136            case 367:
1137                saida = portaoor();
1138                break;
1139            case 368:
1140                saida = portaoand();
1141                break;
1142            case 369:
1143                saida = portaoxor();
1144                break;
1145            case 370:
1146                saida = portaoir();
1147                break;
1148            case 371:
1149                saida = portaoor();
1150                break;
1151            case 372:
1152                saida = portaoand();
1153                break;
1154            case 373:
1155                saida = portaoxor();
1156                break;
1157            case 374:
1158                saida = portaoir();
1159                break;
1160            case 375:
1161                saida = portaoor();
1162                break;
1163            case 376:
1164                saida = portaoand();
1165                break;
1166            case 377:
1167                saida = portaoxor();
1168                break;
1169            case 378:
1170                saida = portaoir();
1171                break;
1172            case 379:
1173                saida = portaoor();
1174                break;
1175            case 380:
1176                saida = portaoand();
1177                break;
1178            case 381:
1179                saida = portaoxor();
1180                break;
1181            case 382:
1182                saida = portaoir();
1183                break;
1184            case 383:
1185                saida = portaoor();
1186                break;
1187            case 384:
1188                saida = portaoand();
1189                break;
1190            case 385:
1191                saida = portaoxor();
1192                break;
1193            case 386:
1194                saida = portaoir();
1195                break;
1196            case 387:
1197                saida = portaoor();
1198                break;
1199            case 388:
1200                saida = portaoand();
1201                break;
1202            case 389:
1203                saida = portaoxor();
1204                break;
1205            case 390:
1206                saida = portaoir();
1207                break;
1208            case 391:
1209                saida = portaoor();
1210                break;
1211            case 392:
1212                saida = portaoand();
1213                break;
1214            case 393:
1215                saida = portaoxor();
1216                break;
1217            case 394:
1218                saida = portaoir();
1219                break;
1220            case 395:
1221                saida = portaoor();
1222                break;
1223            case 396:
1224
```



```
1 // C++ code
2 //
3
4 int entrada = 0,
5     A = 0,
6     B = 0,
7     OP = 0,
8     saida = 0,
9     vail = 0;
10
11 void setup()
12 {
13     Serial.begin(9600);
14     pinMode(10, OUTPUT);
15     pinMode(11, OUTPUT);
16     pinMode(12, OUTPUT);
17     pinMode(13, OUTPUT);
18     digitalWrite(10, LOW);
19     digitalWrite(11, LOW);
20     digitalWrite(12, LOW);
21     digitalWrite(13, LOW);
22 }
23
24 void loop()
25 {
26     if (Serial.available() > 0)
27     {
28         entrada = Serial.parseInt();
29         A = (entrada / 100) % 10; // Centena
30         B = (entrada / 10) % 10; // Dezena
31         OP = entrada % 10; // Unidade
32         vail = 0;
33         switch (OP)
34         {
35             case 0:
36                 saida = portaand();
37                 break;
38             case 1:
39                 saida = portaoxor();
40                 break;
41             case 2:
42                 saida = portaoir();
43                 break;
44             case 3:
45                 saida = portaoer();
46                 break;
47             case 4:
48                 saida = portaoor();
49                 break;
50             case 5:
51                 saida = portaoand();
52                 break;
53             case 6:
54                 saida = portaoxor();
55                 break;
56             case 7:
57                 saida = portaoir();
58                 break;
59             case 8:
60                 saida = portaoer();
61                 break;
62             case 9:
63                 saida = portaoor();
64                 break;
65             case 10:
66                 saida = portaoand();
67                 break;
68             case 11:
69                 saida = portaoxor();
70                 break;
71             case 12:
72                 saida = portaoir();
73                 break;
74             case 13:
75                 saida = portaoer();
76                 break;
77             case 14:
78                 saida = portaoor();
79                 break;
80             case 15:
81                 saida = portaoand();
82                 break;
83             case 16:
84                 saida = portaoxor();
85                 break;
86             case 17:
87                 saida = portaoir();
88                 break;
89             case 18:
90                 saida = portaoer();
91                 break;
92             case 19:
93                 saida = portaoor();
94                 break;
95             case 20:
96                 saida = portaoand();
97                 break;
98             case 21:
99                 saida = portaoxor();
100                break;
101            case 22:
102                saida = portaoir();
103                break;
104            case 23:
105                saida = portaoer();
106                break;
107            case 24:
108                saida = portaoor();
109                break;
110            case 25:
111                saida = portaoand();
112                break;
113            case 26:
114                saida = portaoxor();
115                break;
116            case 27:
117                saida = portaoir();
118                break;
119            case 28:
120                saida = portaoer();
121                break;
122            case 29:
123                saida = portaoor();
124                break;
125            case 30:
126                saida = portaoand();
127                break;
128            case 31:
129                saida = portaoxor();
130                break;
131            case 32:
132                saida = portaoir();
133                break;
134            case 33:
135                saida = portaoer();
136                break;
137            case 34:
138                saida = portaoor();
139                break;
140            case 35:
141                saida = portaoand();
142                break;
143            case 36:
144                saida = portaoxor();
145                break;
146            case 37:
147                saida = portaoir();
148                break;
149            case 38:
150                saida = portaoer();
151                break;
152            case 39:
153                saida = portaoor();
154                break;
155            case 40:
156                saida = portaoand();
157                break;
158            case 41:
159                saida = portaoxor();
160                break;
161            case 42:
162                saida = portaoir();
163                break;
164            case 43:
165                saida = portaoer();
166                break;
167            case 44:
168                saida = portaoor();
169                break;
170            case 45:
171                saida = portaoand();
172                break;
173            case 46:
174                saida = portaoxor();
175                break;
176            case 47:
177                saida = portaoir();
178                break;
179            case 48:
180                saida = portaoer();
181                break;
182            case 49:
183                saida = portaoor();
184                break;
185            case 50:
186                saida = portaoand();
187                break;
188            case 51:
189                saida = portaoxor();
190                break;
191            case 52:
192                saida = portaoir();
193                break;
194            case 53:
195                saida = portaoer();
196                break;
197            case 54:
198                saida = portaoor();
199                break;
200            case 55:
201                saida = portaoand();
202                break;
203            case 56:
204                saida = portaoxor();
205                break;
206            case 57:
207                saida = portaoir();
208                break;
209            case 58:
210                saida = portaoer();
211                break;
212            case 59:
213                saida = portaoor();
214                break;
215            case 60:
216                saida = portaoand();
217                break;
218            case 61:
219                saida = portaoxor();
220                break;
221            case 62:
222                saida = portaoir();
223                break;
224            case 63:
225                saida = portaoer();
226                break;
227            case 64:
228                saida = portaoor();
229                break;
230            case 65:
231                saida = portaoand();
232                break;
233            case 66:
234                saida = portaoxor();
235                break;
236            case 67:
237                saida = portaoir();
238                break;
239            case 68:
240                saida = portaoer();
241                break;
242            case 69:
243                saida = portaoor();
244                break;
245            case 70:
246                saida = portaoand();
247                break;
248            case 71:
249                saida = portaoxor();
250                break;
251            case 72:
252                saida = portaoir();
253                break;
254            case 73:
255                saida = portaoer();
256                break;
257            case 74:
258                saida = portaoor();
259                break;
260            case 75:
261                saida = portaoand();
262                break;
263            case 76:
264                saida = portaoxor();
265                break;
266            case 77:
267                saida = portaoir();
268                break;
269            case 78:
270                saida = portaoer();
271                break;
272            case 79:
273                saida = portaoor();
274                break;
275            case 80:
276                saida = portaoand();
277                break;
278            case 81:
279                saida = portaoxor();
280                break;
281            case 82:
282                saida = portaoir();
283                break;
284            case 83:
285                saida = portaoer();
286                break;
287            case 84:
288                saida = portaoor();
289                break;
290            case 85:
291                saida = portaoand();
292                break;
293            case 86:
294                saida = portaoxor();
295                break;
296            case 87:
297                saida = portaoir();
298                break;
299            case 88:
300                saida = portaoer();
301                break;
302            case 89:
303                saida = portaoor();
304                break;
305            case 90:
306                saida = portaoand();
307                break;
308            case 91:
309                saida = portaoxor();
310                break;
311            case 92:
312                saida = portaoir();
313                break;
314            case 93:
315                saida = portaoer();
316                break;
317            case 94:
318                saida = portaoor();
319                break;
320            case 95:
321                saida = portaoand();
322                break;
323            case 96:
324                saida = portaoxor();
325                break;
326            case 97:
327                saida = portaoir();
328                break;
329            case 98:
330                saida = portaoer();
331                break;
332            case 99:
333                saida = portaoor();
334                break;
335            case 100:
336                saida = portaoand();
337                break;
338            case 101:
339                saida = portaoxor();
340                break;
341            case 102:
342                saida = portaoir();
343                break;
344            case 103:
345                saida = portaoer();
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347            case 104:
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671            case 212:
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716            case 227:
717                saida = portaoir();
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719            case 228:
720                saida = portaoer();
721                break;
722            case 229:
723                saida = portaoor();
724                break;
725            case 230:
726                saida = portaoand();
727                break;
728            case 231:
729                saida = portaoxor();
730                break;
731            case 232:
732                saida = portaoir();
733                break;
734            case 233:
735                saida = portaoer();
736                break;
737            case 234:
738                saida = portaoor();
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740            case 235:
741                saida = portaoand();
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743            case 236:
744                saida = portaoxor();
745                break;
746            case 237:
747                saida = portaoir();
748                break;
749            case 238:
750                saida = portaoer();
751                break;
752            case 239:
753                saida = portaoor();
754                break;
755            case 240:
756                saida = portaoand();
757                break;
758            case 241:
759                saida = portaoxor();
760                break;
761            case 242:
762                saida = portaoir();
763                break;
764            case 243:
765                saida = portaoer();
766                break;
767            case 244:
768                saida = portaoor();
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770            case 245:
771                saida = portaoand();
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774                saida = portaoxor();
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776            case 247:
777                saida = portaoir();
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780                saida = portaoer();
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783                saida = portaoor();
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786                saida = portaoand();
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798                saida = portaoor();
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804                saida = portaoxor();
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810                saida = portaoer();
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813                saida = portaoor();
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816                saida = portaoand();
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819                saida = portaoxor();
820                break;
821            case 262:
822                saida = portaoir();
823                break;
824            case 263:
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827            case 264:
828                saida = portaoor();
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834                saida = portaoxor();
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836            case 267:
837                saida = portaoir();
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840                saida = portaoer();
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843                saida = portaoor();
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846                saida = portaoand();
847                break;
848            case 271:
849                saida = portaoxor();
850                break;
851            case 272:
852                saida = portaoir();
853                break;
854            case 273:
855                saida = portaoer();
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857            case 274:
858                saida = portaoor();
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861                saida = portaoand();
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864                saida = portaoxor();
865                break;
866            case 277:
867                saida = portaoir();
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873                saida = portaoor();
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881            case 282:
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885                saida = portaoer();
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888                saida = portaoor();
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891                saida = portaoand();
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894                saida = portaoxor();
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903                saida = portaoor();
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909                saida = portaoxor();
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911                saida = portaoir();
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941                saida = portaoir();
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947                saida = portaoor();
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953                saida = portaoxor();
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998                saida = portaoxor();
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1000            case 322:
1001                saida = portaoir();
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1004                saida = portaoer();
1005                break;
1006            case 324:
1007                saida = portaoor();
1008                break;
1009            case 325:
1010                saida = portaoand();
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1012            case 326:
1013                saida = portaoxor();
1014                break;
1015            case 327:
1016                saida = portaoir();
1017                break;
1018            case 328:
1019                saida = portaoer();
1020                break;
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1022                saida = portaoor();
1023                break;
1024            case 330:
1025                saida = portaoand();
1026                break;
1027            case 331:
1028                saida = portaoxor();
1029                break;
1030            case 332:
1031                saida = portaoir();
1032                break;
1033            case 333:
1034                saida = portaoer();
1035                break;
1036            case 334:
1037                saida = portaoor();
1038                break;
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1040                saida = portaoand();
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1042            case 336:
1043                saida = portaoxor();
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1049                saida = portaoer();
1050                break;
1051            case 339:
1052                saida = portaoor();
1053                break;
1054            case 340:
1055                saida = portaoand();
1056                break;
1057            case 341:
1058                saida = portaoxor();
1059                break;
1060            case 342:
1061                saida = portaoir();
1062                break;
1063            case 343:
1064                saida = portaoer();
1065                break;
1066            case 344:
1067                saida = portaoor();
1068                break;
1069            case 345:
1070                saida = portaoand();
1071                break;
1072            case 346:
1073                saida = portaoxor();
1074                break;
1075            case 347:
1076                saida = portaoir();
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1079                saida = portaoer();
1080                break;
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1082                saida = portaoor();
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1094                saida = portaoer();
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1097                saida = portaoor();
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1109                saida = portaoer();
1110                break;
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1112                saida = portaoor();
1113                break;
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1115                saida = portaoand();
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1118                saida = portaoxor();
1119                break;
1120            case 362:
1121                saida = portaoir();
1122                break;
1123            case 363:
1124                saida = portaoer();
1125                break;
1126            case 364:
1127                saida = portaoor();
1128                break;
1129            case 365:
1130                saida = portaoand();
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1133                saida = portaoxor();
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1186            case 384:
1187                saida = portaoor();
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1190                saida = portaoand();
1191                break;
1192            case 386:
1193                saida = portaoxor();
1194                break;
1195            case 387:
1196                saida = portaoir();
1197                break;
1198            case 388:
1199                saida = portaoer();
1200                break;
1201            case 389:
1202                saida = portaoor();
1203                break;
1204            case 390:
1205                saida = portaoand();
1206                break;
1207            case 391:
1208                saida = portaoxor();
1209                break;
1210            case 392:
1211                saida = portaoir();
1212                break;
1213            case 393:
1214                saida = portaoer();
1215                break;
1216            case 394:
1217                saida = portaoor();
1218                break;
1219            case 395:
1220                saida = portaoand();
1221                break;
1222            case 396:
1223               
```



```
1 // C++ code
2 //
3
4 int entrada = 0,
5     A = 0,
6     B = 0,
7     OP = 0,
8     saida = 0,
9     vail = 0;
10
11 void setup()
12 {
13     Serial.begin(9600);
14     pinMode(10, OUTPUT);
15     pinMode(11, OUTPUT);
16     pinMode(12, OUTPUT);
17     pinMode(13, OUTPUT);
18     digitalWrite(10, LOW);
19     digitalWrite(11, LOW);
20     digitalWrite(12, LOW);
21     digitalWrite(13, LOW);
22 }
23
24 void loop()
25 {
26     if (Serial.available() > 0)
27     {
28         entrada = Serial.parseInt();
29         A = (entrada / 100) % 10; // Centena
30         B = (entrada / 10) % 10; // Dezena
31         OP = entrada % 10; // Unidade
32         vail = 0;
33         switch (OP)
34         {
35             case 0:
36                 saida = portaand();
37                 break;
38             case 1:
39                 saida = portaoxor();
40                 break;
41             case 2:
42                 saida = portaoir();
43                 break;
44             case 3:
45                 saida = portaoor();
46                 break;
47             case 4:
48                 saida = portaoand();
49                 break;
50             case 5:
51                 saida = portaoxor();
52                 break;
53             case 6:
54                 saida = portaoir();
55                 break;
56             case 7:
57                 saida = portaoor();
58                 break;
59             case 8:
60                 saida = portaoand();
61                 break;
62             case 9:
63                 saida = portaoxor();
64                 break;
65             case 10:
66                 saida = portaoir();
67                 break;
68             case 11:
69                 saida = portaoor();
70                 break;
71             case 12:
72                 saida = portaoand();
73                 break;
74             case 13:
75                 saida = portaoxor();
76                 break;
77             case 14:
78                 saida = portaoir();
79                 break;
80             case 15:
81                 saida = portaoor();
82                 break;
83             case 16:
84                 saida = portaoand();
85                 break;
86             case 17:
87                 saida = portaoxor();
88                 break;
89             case 18:
90                 saida = portaoir();
91                 break;
92             case 19:
93                 saida = portaoor();
94                 break;
95             case 20:
96                 saida = portaoand();
97                 break;
98             case 21:
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103                break;
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1075                break;
1076            case 347:
1077                saida = portaoor();
1078                break;
1079            case 348:
1080                saida = portaoand();
1081                break;
1082            case 349:
1083                saida = portaoxor();
1084                break;
1085            case 350:
1086                saida = portaoir();
1087                break;
1088            case 351:
1089                saida = portaoor();
1090                break;
1091            case 352:
1092                saida = portaoand();
1093                break;
1094            case 353:
1095                saida = portaoxor();
1096                break;
1097            case 354:
1098                saida = portaoir();
1099                break;
1100            case 355:
1101                saida = portaoor();
1102                break;
1103            case 356:
1104                saida = portaoand();
1105                break;
1106            case 357:
1107                saida = portaoxor();
1108                break;
1109            case 358:
1110                saida = portaoir();
1111                break;
1112            case 359:
1113                saida = portaoor();
1114                break;
1115            case 360:
1116                saida = portaoand();
1117                break;
1118            case 361:
1119                saida = portaoxor();
1120                break;
1121            case 362:
1122                saida = portaoir();
1123                break;
1124            case 363:
1125                saida = portaoor();
1126                break;
1127            case 364:
1128                saida = portaoand();
1129                break;
1130            case 365:
1131                saida = portaoxor();
1132                break;
1133            case 366:
1134                saida = portaoir();
1135                break;
1136            case 367:
1137                saida = portaoor();
1138                break;
1139            case 368:
1140                saida = portaoand();
1141                break;
1142            case 369:
1143                saida = portaoxor();
1144                break;
1145            case 370:
1146                saida = portaoir();
1147                break;
1148            case 371:
1149                saida = portaoor();
1150                break;
1151            case 372:
1152                saida = portaoand();
1153                break;
1154            case 373:
1155                saida = portaoxor();
1156                break;
1157            case 374:
1158                saida = portaoir();
1159                break;
1160            case 375:
1161                saida = portaoor();
1162                break;
1163            case 376:
1164                saida = portaoand();
1165                break;
1166            case 377:
1167                saida = portaoxor();
1168                break;
1169            case 378:
1170                saida = portaoir();
1171                break;
1172            case 379:
1173                saida = portaoor();
1174                break;
1175            case 380:
1176                saida = portaoand();
1177                break;
1178            case 381:
1179                saida = portaoxor();
1180                break;
1181            case 382:
1182                saida = portaoir();
1183                break;
1184            case 383:
1185                saida = portaoor();
1186                break;
1187            case 384:
1188                saida = portaoand();
1189                break;
1190            case 385:
1191                saida = portaoxor();
1192                break;
1193            case 386:
1194                saida = portaoir();
1195                break;
1196            case 387:
1197                saida = portaoor();
1198                break;
1199            case 388:
1200                saida = portaoand();
1201                break;
1202            case 389:
1203                saida = portaoxor();
1204                break;
1205            case 390:
1206                saida = portaoir();
1207                break;
1208            case 391:
1209                saida = portaoor();
1210                break;
1211            case 392:
1212                saida = portaoand();
1213                break;
1214            case 393:
1215                saida = portaoxor();
1216                break;
1217            case 394:
1218                saida = portaoir();
1219                break;
1220            case 395:
1221                saida = portaoor();
1222                break;
1223            case 396:
1224
```