

# LCOV - code coverage report

Current view: [top level](#) - [appsecassignment1](#) - [giftcardreader.c](#) ([source](#) / [functions](#))

Test: [hang.info](#)

Date: 2021-02-21 12:23:20

	Hit	Total	Coverage
Lines:	95	174	54.6 %
Functions:	5	6	83.3 %

Line data Source code

```

1      : /*
2      :  * Gift Card Reading Application
3      :  * Original Author: Shoddycorp's Cut-Rate Contracting
4      :  * Comments added by: Justin Cappos (JAC) and Brendan Dolan-Gavitt (BDG)
5      :  * Maintainer:
6      :  * Date: 8 July 2020
7      :  */
8      :
9      :
10     : #include "giftcard.h"
11     :
12     : #include <stdio.h>
13     : #include <strings.h>
14     :
15     : // interpreter for THX-1138 assembly
16     2 : void animate(char *msg, unsigned char *program) {
17     :     unsigned char regs[16];
18     2 :     char *mptr = msg;
19     2 :     unsigned char *pc = program;
20     2 :     int i = 0;
21     2 :     int zf = 0;
22     :
23     28 :     while (1) {
24     :         unsigned char op, arg1, arg2;
25     26 :         op = *pc;
26     26 :         arg1 = *(pc+1);
27     26 :         arg2 = *(pc+2);
28     26 :         switch (*pc) {
29     :             case 0x00:
30     20 :                 break;
31     :             case 0x01:
32     :                 //if (arg1 < 0 || arg1 > 15)
33     :                 //{
34     :                 //break;
35     :                 // }
36     0 :                 regs[arg1] = *mptr;
37     0 :                 break;
38     :
39     :                 case 0x02:
40     0 :                     *mptr = regs[arg1];
41     0 :                     break;
42     :                 case 0x03:
43     0 :                     mptr += (char)arg1;
44     0 :                     break;

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45         :           case 0x04:
46         0 :           regs[arg2] = arg1;
47         0 :           break;
48         :           case 0x05:
49         0 :           regs[arg1] ^= regs[arg2];
50         0 :           zf = !regs[arg1];
51         0 :           break;
52         :           case 0x06:
53         0 :           regs[arg1] += regs[arg2];
54         0 :           zf = !regs[arg1];
55         0 :           break;
56         :           case 0x07:
57         0 :           puts(msg);
58         0 :           break;
59         :           case 0x08:
60         0 :           goto done;
61         :           case 0x09:
62         2 :           pc += arg1;
63         :           // pc += (char)arg1;
64         2 :           break;
65         :
66         :           case 0x10:
67         0 :           if (zf) pc += (char)arg1;
68         0 :           break;
69         :       }
70         26 :       pc+=3;
71         26 :       if (pc > program+256) break;
72         :   }
73         :   done:
74         2 :   return;
75         :   }
76         :
77         4 : int get_gift_card_value(struct this_gift_card *thisone) {
78         :     struct gift_card_data *gcd_ptr;
79         :     struct gift_card_record_data *gcrd_ptr;
80         :     struct gift_card_amount_change *gcac_ptr;
81         4 :     int ret_count = 0;
82         :
83         4 :     gcd_ptr = thisone->gift_card_data;
84         8 :     for(int i=0;i<gcd_ptr->number_of_gift_card_records; i++) {
85         4 :         gcrd_ptr = (struct gift_card_record_data *) gcd_ptr->gift_card_record_data[i];
86         4 :         if (gcrd_ptr->type_of_record == 1) {
87         0 :             gcac_ptr = gcrd_ptr->actual_record;
88         0 :             ret_count += gcac_ptr->amount_added;
89         0 :         }
90         4 :     }
91         4 :     return ret_count;
92         :   }
93         :
94         :
95         4 : void print_gift_card_info(struct this_gift_card *thisone) {
96         :     struct gift_card_data *gcd_ptr;
97         :     struct gift_card_record_data *gcrd_ptr;
98         :     struct gift_card_amount_change *gcac_ptr;
99         :     struct gift_card_program *gcp_ptr;

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100      :
101      4 :      gcd_ptr = thisone->gift_card_data;
102      4 :      printf("    Merchant ID: %32.32s\n",gcd_ptr->merchant_id);
103      4 :      printf("    Customer ID: %32.32s\n",gcd_ptr->customer_id);
104      4 :      printf("    Num records: %d\n",gcd_ptr->number_of_gift_card_records);
105      8 :      for(int i=0;i<gcd_ptr->number_of_gift_card_records; i++) {
106      4 :          gcd_ptr = (struct gift_card_record_data *) gcd_ptr->gift_card_record_data[i];
107      4 :          if (gcd_ptr->type_of_record == 1) {
108      0 :              printf("        record_type: amount_change\n");
109      0 :              gcac_ptr = gcd_ptr->actual_record;
110      0 :              printf("        amount_added: %d\n",gcac_ptr->amount_added);
111      0 :              if (gcac_ptr->amount_added>0) {
112      0 :                  printf("        signature: %32.32s\n",gcac_ptr->actual_signature);
113      0 :              }
114      0 :          }
115      4 :          else if (gcd_ptr->type_of_record == 2) {
116      2 :              printf("        record_type: message\n");
117      2 :              printf("        message: %s\n", (char *)gcd_ptr->actual_record);
118      2 :          }
119      2 :          else if (gcd_ptr->type_of_record == 3) {
120      2 :              gcp_ptr = gcd_ptr->actual_record;
121      2 :              printf("        record_type: animated message\n");
122      2 :              printf("        message: %s\n", gcp_ptr->message);
123      2 :              printf(" [running embedded program]  \n");
124      2 :              animate(gcp_ptr->message, gcp_ptr->program);
125      2 :          }
126      4 :      }
127      4 :      printf("    Total value: %d\n\n",get_gift_card_value(thisone));
128      4 :  }
129      :
130      : // Added to support web functionalities
131      :
132      :
133      :
134      0 : void gift_card_json(struct this_gift_card *thisone) {
135      :     struct gift_card_data *gcd_ptr;
136      :     struct gift_card_record_data *gcd_ptr;
137      :     struct gift_card_amount_change *gcac_ptr;
138      0 :     gcd_ptr = thisone->gift_card_data;
139      0 :     printf("{\n");
140      0 :     printf("  \"merchant_id\": \"%32.32s\", \n", gcd_ptr->merchant_id);
141      0 :     printf("  \"customer_id\": \"%32.32s\", \n", gcd_ptr->customer_id);
142      0 :     printf("  \"total_value\": %d, \n", get_gift_card_value(thisone));
143      0 :     printf("  \"records\": [\n");
144      0 :     for(int i=0;i<gcd_ptr->number_of_gift_card_records; i++) {
145      0 :         gcd_ptr = (struct gift_card_record_data *) gcd_ptr->gift_card_record_data[i];
146      0 :         printf("    {\n");
147      0 :         if (gcd_ptr->type_of_record == 1) {
148      0 :             printf("      \"record_type\": \"amount_change\", \n");
149      0 :             gcac_ptr = gcd_ptr->actual_record;
150      0 :             printf("      \"amount_added\": %d, \n", gcac_ptr->amount_added);
151      0 :             if (gcac_ptr->amount_added>0) {
152      0 :                 printf("      \"signature\": \"%32.32s\", \n", gcac_ptr->actual_signature);
153      0 :             }
154      0 :         }

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155      0 :      else if (gcrd_ptr->type_of_record == 2) {
156      0 :          printf("      \"record_type\": \"message\", \n");
157      0 :          printf("      \"message\": \"%s\", \n", (char *)gcrd_ptr->actual_record);
158      0 :      }
159      0 :      else if (gcrd_ptr->type_of_record == 3) {
160      0 :          struct gift_card_program *gcp = gcrd_ptr->actual_record;
161      0 :          printf("      \"record_type\": \"animated message\", \n");
162      0 :          printf("      \"message\": \"%s\", \n", gcp->message);
163      :          // programs are binary so we will hex for the json
164      0 :          char *hexchars = "01234567890abcdef";
165      :          char program_hex[512+1];
166      0 :          program_hex[512] = '\0';
167      :          int i;
168      0 :          for(i = 0; i < 256; i++) {
169      0 :              program_hex[i*2] = hexchars[((gcp->program[i] & 0xf0) >> 4)];
170      0 :              program_hex[i*2+1] = hexchars[(gcp->program[i] & 0x0f)];
171      0 :          }
172      0 :          printf("      \"program\": \"%s\", \n", program_hex);
173      0 :      }
174      0 :      if (i < gcrd_ptr->number_of_gift_card_records-1)
175      0 :          printf("      }, \n");
176      :      else
177      0 :          printf("      } \n");
178      0 :      }
179      0 :      printf("  ] \n");
180      0 :      printf("} \n");
181      0 : }
182      :
183      :
184      :
185      :
186      :
187      : /* JAC: input_fd is misleading... It's a FILE type, not a fd */
188      6 : struct this_gift_card *gift_card_reader(FILE *input_fd) {
189      :
190      6 :      struct this_gift_card *ret_val = malloc(sizeof(struct this_gift_card));
191      :
192      :      void *optr;
193      :      void *ptr;
194      :
195      :      // Loop to do the whole file
196      10 :      while (!feof(input_fd)) {
197      :
198      :          struct gift_card_data *gcd_ptr;
199      :          /* JAC: Why aren't return types checked? */
200      6 :          fread(&ret_val->num_bytes, 4, 1, input_fd);
201      :
202      6 :          if (ret_val->num_bytes < 0) {
203      :
204      2 :              printf (" Negative value \n");
205      2 :              exit(0);
206      :
207      :          }
208      :
209      :          // Make something the size of the rest and read it in

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210      4 :      ptr = malloc(ret_val->num_bytes);
211      4 :      fread(ptr, ret_val->num_bytes, 1, input_fd);
212      :
213      4 :      optr = ptr-4;
214      :
215      4 :      gcd_ptr = ret_val->gift_card_data = malloc(sizeof(struct gift_card_data));
216      4 :      gcd_ptr->merchant_id = ptr;
217      4 :      ptr += 32;
218      : //      printf("VD: %d\n", (int)ptr - (int) gcd_ptr->merchant_id);
219      4 :      gcd_ptr->customer_id = ptr;
220      4 :      ptr += 32;
221      :      /* JAC: Something seems off here... */
222      4 :      gcd_ptr->number_of_gift_card_records = *((char *)ptr);
223      4 :      ptr += 4;
224      :
225      4 :      gcd_ptr->gift_card_record_data = (void *)malloc(gcd_ptr->number_of_gift_card_records*sizeof(void*));
226      :
227      :      // Now ptr points at the gift card recrod data
228      12 :      for (int i=0; i<=gcd_ptr->number_of_gift_card_records; i++){
229      :          //printf("i: %d\n", i);
230      :          struct gift_card_record_data *gcrd_ptr;
231      8 :          gcrd_ptr = gcd_ptr->gift_card_record_data[i] = malloc(sizeof(struct gift_card_record_data));
232      :          struct gift_card_amount_change *gcac_ptr;
233      8 :          gcac_ptr = gcrd_ptr->actual_record = malloc(sizeof(struct gift_card_record_data));
234      :          struct gift_card_program *gcp_ptr;
235      8 :          gcp_ptr = malloc(sizeof(struct gift_card_program));
236      :
237      8 :          gcrd_ptr->record_size_in_bytes = *((char *)ptr);
238      :          //printf("rec at %x, %d bytes\n", ptr - optr, gcrd_ptr->record_size_in_bytes);
239      8 :          ptr += 4;
240      :          //printf("record data: %d\n", gcrd_ptr->record_size_in_bytes);
241      8 :          gcrd_ptr->type_of_record = *((char *)ptr);
242      8 :          ptr += 4;
243      :          //printf("type of rec: %d\n", gcrd_ptr->type_of_record);
244      :
245      :          // amount change
246      8 :          if (gcrd_ptr->type_of_record == 1) {
247      0 :              gcac_ptr->amount_added = *((int*) ptr);
248      0 :              ptr += 4;
249      :
250      :              // don't need a sig if negative
251      :              /* JAC: something seems off here */
252      0 :              if (gcac_ptr < 0) break;
253      :
254      0 :              gcac_ptr->actual_signature = ptr;
255      0 :              ptr+=32;
256      0 :          }
257      :          // message
258      8 :          if (gcrd_ptr->type_of_record == 2) {
259      2 :              gcrd_ptr->actual_record = ptr;
260      :              // advance by the string size + 1 for nul
261      :              // BDG: does not seem right
262      2 :              ptr=ptr+strlen((char *)gcrd_ptr->actual_record)+1;
263      2 :          }
264      :          // BDG: never seen one of these in the wild

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265      :          // text animatino (BETA)
266      8 :          if (gcrd_ptr->type_of_record == 3) {
267      2 :              gcp_ptr->message = malloc(32);
268      2 :              gcp_ptr->program = malloc(256);
269      2 :              memcpy(gcp_ptr->message, ptr, 32);
270      2 :              ptr+=32;
271      2 :              memcpy(gcp_ptr->program, ptr, 256);
272      2 :              ptr+=256;
273      2 :              gcrd_ptr->actual_record = gcp_ptr;
274      2 :          }
275      8 :      }
276      :      }
277      4 :      return ret_val;
278      :  }
279      :
280      :  // BDG: why not a local variable here?
281      :  struct this_gift_card *thisone;
282      :
283      6 :  int main(int argc, char **argv) {
284      :      // BDG: no argument checking?
285      6 :      FILE *input_fd = fopen(argv[2], "r");
286      6 :      if (input_fd == NULL)
287      :      {
288      0 :          printf("sorry, you must pass a gift card file.\n");
289      0 :          return 0;
290      :
291      :      }
292      6 :      thisone = gift_card_reader(input_fd);
293      6 :      if (argv[1][0] == '1') print_gift_card_info(thisone);
294      0 :      else if (argv[1][0] == '2') gift_card_json(thisone);
295      :
296      4 :      return 0;
297      4 :  }
```

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