Lab2

A função mostra o endereço de cada byte que compõe o número inteiro armazenado na variável i.

```c
lab2 > C ex1.c
   3    void dump (void *p, int n) {
   5       while (n--) {
   8       }
   9    }
  10
  11    int main (void) {
  12       int i = 10000;
  13       dump(&i, sizeof(i));
  14       return 0;
  15    }
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS

compilation terminated.
dvd@ATGRJ-QA-N05:~/sobas$ cd lab2
dvd@ATGRJ-QA-N05:~/sobas/lab2$ gcc -Wall -o ex1 ex1.c
dvd@ATGRJ-QA-N05:~/sobas/lab2$ ./ex1
0x7ffe03e7ec84 - 10
0x7ffe03e7ec85 - 27
0x7ffe03e7ec86 - 00
0x7ffe03e7ec87 - 00
dvd@ATGRJ-QA-N05:~/sobas/lab2$
```

Pode-se observar que ao trocarmos um int por um short int, ao invés de 4 bytes alinhados, são dispostos 2:

```c
lab2 > C ex1.c
 22    }
 12      int i = 10000;
 13      short s = 20;
 14      long l = 289739829332245;
 15      dump(&i, sizeof(i));
 16      printf("space\n");
 17      dump(&s, sizeof(s));
 18      printf("space\n");
```

PROBLEMS　　OUTPUT　　DEBUG CONSOLE　　**TERMINAL**　　PORTS

```
dvd@ATGRJ-QA-N05:~/sobas/lab2$ gcc -Wall -o ex1 ex1.c
dvd@ATGRJ-QA-N05:~/sobas/lab2$ ./ex1
0x7fff2bd2737c - 10
0x7fff2bd2737d - 27
0x7fff2bd2737e - 00
0x7fff2bd2737f - 00
space
0x7fff2bd2737a - 14
0x7fff2bd2737b - 00
space
0x7fff2bd27380 - 15
0x7fff2bd27381 - c9
0x7fff2bd27382 - 9a
0x7fff2bd27383 - 4f
0x7fff2bd27384 - 84
0x7fff2bd27385 - 07
0x7fff2bd27386 - 01
0x7fff2bd27387 - 00
dvd@ATGRJ-QA-N05:~/sobas/lab2$ ▯
```

(handwritten annotations: "int", "short", "long")

lab2 > C ex1.c

```c
11      int main (void) {

14        long l = 289739829332245;
15        char c = 'D';
16        char a = 68;
17        dump(&i, sizeof(i));
18        printf("space\n");
19        dump(&s, sizeof(s));
20        printf("space\n");
21        dump(&l, sizeof(l));
22        printf("CHAR D\n");
23        dump(&c, sizeof(c));
24        printf("ASCII 68 \n");
25        dump(&a, sizeof(a));
26
27        return 0;
28      }
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERM

```
0x7ffc4b0b0d55 - 07
0x7ffc4b0b0d56 - 01
0x7ffc4b0b0d57 - 00
CHAR D
0x7ffc4b0b0d48 - 44
ASCII 68
0x7ffc4b0b0d49 - 44
dvd@ATGRJ-QA-N05:~/sobas/lab2$
```

o valor ascii 68 corresponde ao mesmo valor "D".

```c
ab2 > C ex1.c
11      int main (void) {
14          long l = 289739829332245;
15          char c = 'D';
16          char a = 68;
17          dump(&i, sizeof(i));
18          printf("space\n");
19          dump(&s, sizeof(s));
20          printf("space\n");
21          dump(&l, sizeof(l));
22          printf("CHAR D\n");
23          dump(&c, sizeof(c));
24          printf("ASCII 68 \n");
25          dump(&a, sizeof(a));
26          char p[] = "7509";
27          printf("array de char \n");
28          dump(p, sizeof(p));
29
30          return 0;
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERM

0x7ffc774dff41 - 44
array de char
0x7ffc774dff53 - 37
0x7ffc774dff54 - 35
0x7ffc774dff55 - 30
0x7ffc774dff56 - 39
0x7ffc774dff57 - 00
```

O array de char tem 4 elementos e 5 bytes pois um deles é o inicializador do array.

```
11    int main (void) {
12        printf("==> %d\n", string2num("1234"));
13        printf("==> %d\n", string2num("1234") + 1);
14        printf("==> %d\n", string2num("1234") + stri
15        return 0;
16    }
```

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS

nux-gnu/Scrt1.o: in function `_start':
(.text+0x1b): undefined reference to `main'
collect2: error: ld returned 1 exit status
dvd@ATGRJ-QA-N05:~/sobas/lab2$ gcc -Wall -o ex2 ex2.c
dvd@ATGRJ-QA-N05:~/sobas/lab2$ ./ex2
==> 1234
==> 1235
==> 1235
dvd@ATGRJ-QA-N05:~/sobas/lab2$ 
```

A função transforma um caracter em um int. Multiplica por 10 para jogar o caractere para esquerda fazendo com que toda a string que contém os caracteres numéricos seja convertida para um inteiro.

```c
#include <ctype.h>
#include <stdio.h>

int string2num (char *s, int base) {
  int a = 0;
  for (; *s; s++)
    a = a*base + (*s - '0');
  return a;
}

int main (void) {
  printf("==> %d\n", string2num("1234", 2));
  printf("==> %d\n", string2num("1234", 6) + 1);
  printf("==> %d\n", string2num("1234", 8) + string2num("1",8));
  return 0;
}
```

lab2 > C ex2.c

```c
10    int string2num2(char *s, int base) {
11        int a = 0;
12        for (; *s; s++) {
13            int val;
14            if (isdigit(*s)) {
15                val = *s - '0';
16            } else if (base > 10 && tolower(*s) >= 'a' && tolower(*s) <= 'z') {
17                val = tolower(*s) - 'a' + 10;
18            }
19            a = a * base + val;
20        }
21        return a;
22    }
23    int main (void) {
24      printf("==> %d\n", string2num("1234", 2));
25      printf("==> %d\n", string2num("1234", 6) + 1);
26      printf("==> %d\n", string2num("1234", 8) + string2num("1",8));
27      printf("%d\n", string2num("777", 8));
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   **TERMINAL**   PORTS

```
==> 26
==> 311
==> 669
511
777
26
41115
1633295
```