

C_Exemplos_Recursivos_e_iterativos

February 26, 2021

1 bla

Aprendizado sobre problemas recursivos e iterativos usando C

1.0.1 Problema 1

Mostre um padrão sem usar nenhum loop

Dado um número n , mostre o seguinte padrão sem usar nenhum loop.

Exemplos :

Input: $n = 16$

Output: 16, 11, 6, 1, -4, 1, 6, 11, 16

Input: $n = 10$

Output: 10, 5, 0, 5, 10

É removido 5 um por um até que se atinja a um **número negativo ou 0**. Após o atingir, adiciona-se 5 até atingir n .

Original: <https://www.geeksforgeeks.org/print-a-pattern-without-using-any-loop/>

```
[1]: #include <stdio.h>
#include <stdbool.h>

#define N 45

int n = N;

int noLoopRec(int input, bool ladder) {

    if (input <= 0){
        ladder = true;
    }

    if (ladder){ // pra cima
        if (input != n){
            printf("%d, ", input);
        }
    }
}
```

```

        return noLoopRec((input + 5), true);

    } else {
        printf("%d", input);
        return true;
    }
} else { // pra baixo
    printf("%d, ", input);
    return noLoopRec((input - 5), false);
}
}

int main(){

    int result = 0;

    noLoopRec(n, false);

    return 0;
}

```

```

File "<ipython-input-1-1301bbe54f31>", line 6
int n = N;
      ^

```

SyntaxError: invalid syntax

Saida:

45, 40, 35, 30, 25, 20, 15, 10, 5, 0, 5, 10, 15, 20, 25, 30, 35, 40, 45

1.0.2 Problema 2

teste

```
[2]: %%writefile dsa.c
```

UsageError: %%writefile is a cell magic, but the cell body is empty.

```
[ ]: %%shell
```

```
gcc dsa.c -o output
./output
```

```
[3]: from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

```
[ ]: !wget -nc https://raw.githubusercontent.com/brpy/colab-pdf/master/colab_pdf.py
from colab_pdf import colab_pdf
colab_pdf('C_Exemplos_Recursivos_e_iterativos.ipynb')
```

File colab_pdf.py already there; not retrieving.

```
Ign:1 https://developer.download.nvidia.com/compute/cuda/repos/ubuntu1804/x86_64
InRelease
Get:2 https://cloud.r-project.org/bin/linux/ubuntu bionic-cran40/ InRelease
[3,626 B]
Hit:3 http://archive.ubuntu.com/ubuntu bionic InRelease
Get:4 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:5 http://ppa.launchpad.net/c2d4u.team/c2d4u4.0+/ubuntu bionic InRelease
[15.9 kB]
Ign:6 https://developer.download.nvidia.com/compute/machine-
learning/repos/ubuntu1804/x86_64 InRelease
Hit:7 https://developer.download.nvidia.com/compute/cuda/repos/ubuntu1804/x86_64
Release
Hit:8 https://developer.download.nvidia.com/compute/machine-
learning/repos/ubuntu1804/x86_64 Release
Get:9 http://archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Hit:10 http://ppa.launchpad.net/cran/libgit2/ubuntu bionic InRelease
Get:11 http://archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Hit:12 http://ppa.launchpad.net/deadsnakes/ppa/ubuntu bionic InRelease
Hit:13 http://ppa.launchpad.net/graphics-drivers/ppa/ubuntu bionic InRelease
Get:16 http://ppa.launchpad.net/c2d4u.team/c2d4u4.0+/ubuntu bionic/main Sources
[1,738 kB]
Get:17 http://security.ubuntu.com/ubuntu bionic-security/universe amd64 Packages
[1,392 kB]
Get:18 http://archive.ubuntu.com/ubuntu bionic-updates/universe amd64 Packages
[2,163 kB]
Get:19 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages
[1,964 kB]
Get:20 http://ppa.launchpad.net/c2d4u.team/c2d4u4.0+/ubuntu bionic/main amd64
Packages [889 kB]
Get:21 http://archive.ubuntu.com/ubuntu bionic-updates/main amd64 Packages
[2,394 kB]
Fetched 10.8 MB in 3s (3,337 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
32 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree
Reading state information... Done
```

The following additional packages will be installed:

```
fonts-droid-fallback fonts-lato fonts-lmodern fonts-noto-mono fonts-texgyre
javascript-common libcupsfilters1 libcupsimage2 libgs9 libgs9-common
libijs-0.35 libjbig2dec0 libjs-jquery libkpathsea6 libpotrace0 libptexenc1
libruby2.5 libsynchronet1 libtexlua52 libtexluajit2 libzip-0-13 lmodern
poppler-data preview-latex-style rake ruby ruby-did-you-mean ruby-minitest
ruby-net-telnet ruby-power-assert ruby-test-unit ruby2.5
rubygems-integration tlutils tex-common tex-gyre texlive-base
texlive-binaries texlive-latex-base texlive-latex-extra
texlive-latex-recommended texlive-pictures texlive-plain-generic tipa
```

Suggested packages:

```
fonts-noto apache2 | lighttpd | httpd poppler-utils ghostscript
fonts-japanese-mincho | fonts-ipafont-mincho fonts-japanese-gothic
| fonts-ipafont-gothic fonts-arphic-ukai fonts-arphic-uming fonts-nanum ri
ruby-dev bundler debhelper gv | postscript-viewer perl-tk xpdf-reader
| pdf-viewer texlive-fonts-recommended-doc texlive-latex-base-doc
python-pygments icc-profiles libfile-which-perl
libspreadsheet-parseexcel-perl texlive-latex-extra-doc
texlive-latex-recommended-doc texlive-pstricks dot2tex prerex ruby-tcltk
| libtcltk-ruby texlive-pictures-doc vprerex
```

The following NEW packages will be installed:

```
fonts-droid-fallback fonts-lato fonts-lmodern fonts-noto-mono fonts-texgyre
javascript-common libcupsfilters1 libcupsimage2 libgs9 libgs9-common
libijs-0.35 libjbig2dec0 libjs-jquery libkpathsea6 libpotrace0 libptexenc1
libruby2.5 libsynchronet1 libtexlua52 libtexluajit2 libzip-0-13 lmodern
poppler-data preview-latex-style rake ruby ruby-did-you-mean ruby-minitest
ruby-net-telnet ruby-power-assert ruby-test-unit ruby2.5
rubygems-integration tlutils tex-common tex-gyre texlive-base
texlive-binaries texlive-fonts-recommended texlive-generic-recommended
texlive-latex-base texlive-latex-extra texlive-latex-recommended
texlive-pictures texlive-plain-generic texlive-xetex tipa
```

0 upgraded, 47 newly installed, 0 to remove and 32 not upgraded.

Need to get 146 MB of archives.

After this operation, 460 MB of additional disk space will be used.

Get:1 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 fonts-droid-fallback all 1:6.0.1r16-1.1 [1,805 kB]

Get:2 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 fonts-lato all 2.0-2 [2,698 kB]

Get:3 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 poppler-data all 0.4.8-2 [1,479 kB]

Get:4 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 tex-common all 6.09 [33.0 kB]

Get:5 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 fonts-lmodern all 2.004.5-3 [4,551 kB]

Get:6 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 fonts-noto-mono all 20171026-2 [75.5 kB]

Get:7 <http://archive.ubuntu.com/ubuntu> bionic/universe amd64 fonts-texgyre all 20160520-1 [8,761 kB]

Get:8 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 javascript-common all 11 [6,066 B]
Get:9 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libcupsfilters1 amd64 1.20.2-0ubuntu3.1 [108 kB]
Get:10 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libcupsimage2 amd64 2.2.7-1ubuntu2.8 [18.6 kB]
Get:11 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 libijs-0.35 amd64 0.35-13 [15.5 kB]
Get:12 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 libjbig2dec0 amd64 0.13-6 [55.9 kB]
Get:13 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libgs9-common all 9.26~dfsg+0-0ubuntu0.18.04.14 [5,092 kB]
Get:14 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libgs9 amd64 9.26~dfsg+0-0ubuntu0.18.04.14 [2,265 kB]
Get:15 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 libjs-jquery all 3.2.1-1 [152 kB]
Get:16 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libkpathsea6 amd64 2017.20170613.44572-8ubuntu0.1 [54.9 kB]
Get:17 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 libpotrace0 amd64 1.14-2 [17.4 kB]
Get:18 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libptexenc1 amd64 2017.20170613.44572-8ubuntu0.1 [34.5 kB]
Get:19 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 rubygems-integration all 1.11 [4,994 B]
Get:20 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 ruby2.5 amd64 2.5.1-1ubuntu1.7 [48.6 kB]
Get:21 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 ruby amd64 1:2.5.1 [5,712 B]
Get:22 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 rake all 12.3.1-1ubuntu0.1 [44.9 kB]
Get:23 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 ruby-did-you-mean all 1.2.0-2 [9,700 B]
Get:24 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 ruby-minitest all 5.10.3-1 [38.6 kB]
Get:25 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 ruby-net-telnet all 0.1.1-2 [12.6 kB]
Get:26 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 ruby-power-assert all 0.3.0-1 [7,952 B]
Get:27 <http://archive.ubuntu.com/ubuntu> bionic/main amd64 ruby-test-unit all 3.2.5-1 [61.1 kB]
Get:28 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libruby2.5 amd64 2.5.1-1ubuntu1.7 [3,068 kB]
Get:29 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libsyntax1 amd64 2017.20170613.44572-8ubuntu0.1 [41.4 kB]
Get:30 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libtexlua52 amd64 2017.20170613.44572-8ubuntu0.1 [91.2 kB]
Get:31 <http://archive.ubuntu.com/ubuntu> bionic-updates/main amd64 libtexluajit2 amd64 2017.20170613.44572-8ubuntu0.1 [230 kB]

```
Get:32 http://archive.ubuntu.com/ubuntu bionic-updates/main amd64 libzip-0-13
amd64 0.13.62-3.1ubuntu0.18.04.1 [26.0 kB]
Get:33 http://archive.ubuntu.com/ubuntu bionic/main amd64 lmodern all 2.004.5-3
[9,631 kB]
Get:34 http://archive.ubuntu.com/ubuntu bionic/main amd64 preview-latex-style
all 11.91-1ubuntu1 [185 kB]
Get:35 http://archive.ubuntu.com/ubuntu bionic/main amd64 t1utils amd64 1.41-2
[56.0 kB]
Get:36 http://archive.ubuntu.com/ubuntu bionic/universe amd64 tex-gyre all
20160520-1 [4,998 kB]
Get:37 http://archive.ubuntu.com/ubuntu bionic-updates/main amd64 texlive-
binaries amd64 2017.20170613.44572-8ubuntu0.1 [8,179 kB]
Get:38 http://archive.ubuntu.com/ubuntu bionic/main amd64 texlive-base all
2017.20180305-1 [18.7 MB]
Get:39 http://archive.ubuntu.com/ubuntu bionic/universe amd64 texlive-fonts-
recommended all 2017.20180305-1 [5,262 kB]
Get:40 http://archive.ubuntu.com/ubuntu bionic/universe amd64 texlive-plain-
generic all 2017.20180305-2 [23.6 MB]
Get:41 http://archive.ubuntu.com/ubuntu bionic/universe amd64 texlive-generic-
recommended all 2017.20180305-1 [15.9 kB]
Get:42 http://archive.ubuntu.com/ubuntu bionic/main amd64 texlive-latex-base all
2017.20180305-1 [951 kB]
Get:43 http://archive.ubuntu.com/ubuntu bionic/main amd64 texlive-latex-
recommended all 2017.20180305-1 [14.9 MB]
Get:44 http://archive.ubuntu.com/ubuntu bionic/universe amd64 texlive-pictures
all 2017.20180305-1 [4,026 kB]
Get:45 http://archive.ubuntu.com/ubuntu bionic/universe amd64 texlive-latex-
extra all 2017.20180305-2 [10.6 MB]
Get:46 http://archive.ubuntu.com/ubuntu bionic/universe amd64 tipa all 2:1.3-20
[2,978 kB]
Get:47 http://archive.ubuntu.com/ubuntu bionic/universe amd64 texlive-xetex all
2017.20180305-1 [10.7 MB]
Fetched 146 MB in 5s (27.1 MB/s)
```

[5]: !pwd

/content