

Introdução ao Free Pascal & Linux

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Ci066 - 2018/2

Diretórios / Pastas

- Criando diretório

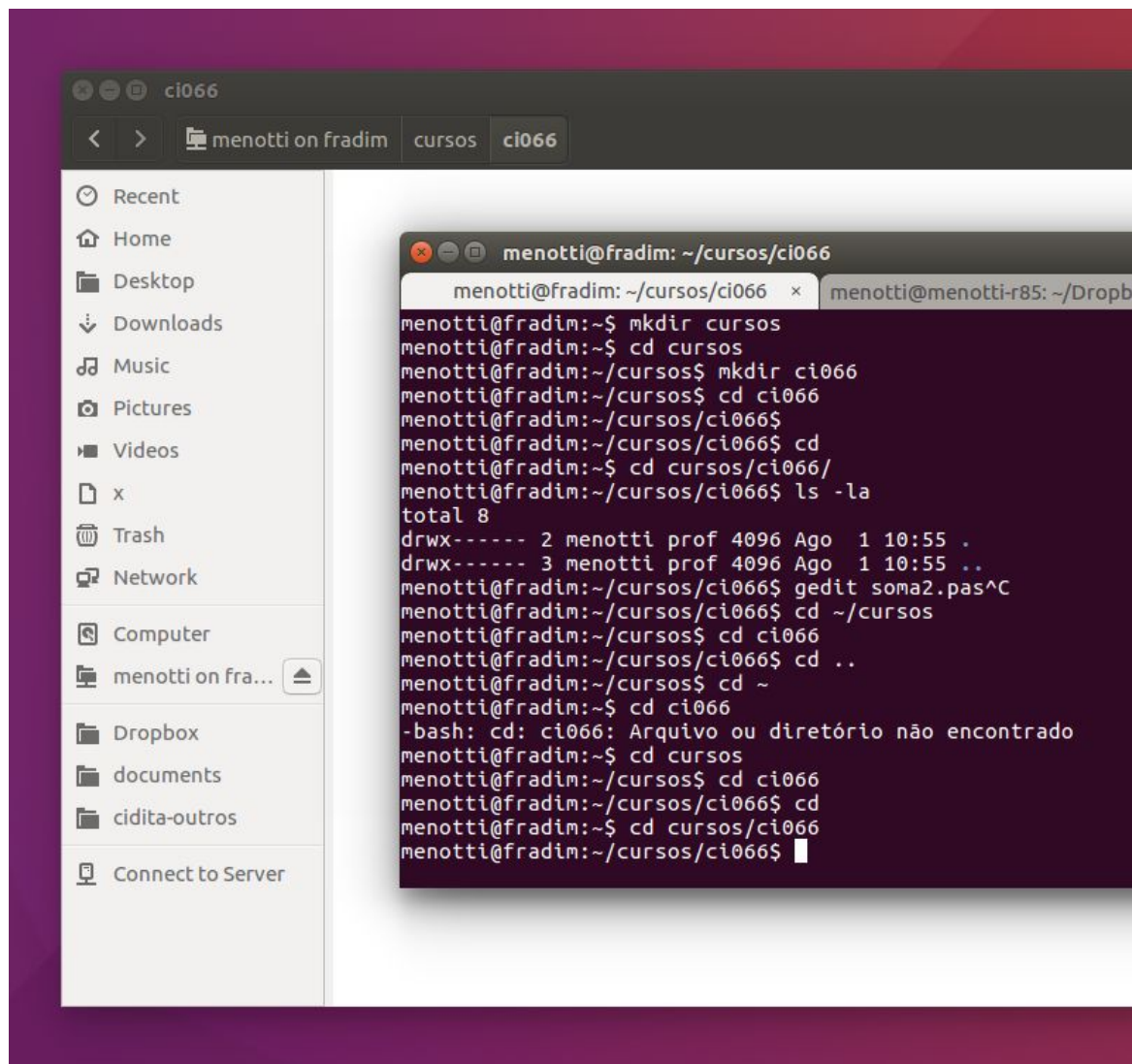
- mkdir cursos
- cd cursos
- mkdir ci066
- cd ci066

```
menotti@fradim:~$ mkdir cursos
menotti@fradim:~$ cd cursos
menotti@fradim:~/cursos$ mkdir ci066
menotti@fradim:~/cursos$ cd ci066
menotti@fradim:~/cursos/ci066$
menotti@fradim:~/cursos/ci066$ cd
menotti@fradim:~$ cd cursos/ci066/
```

- Andando na árvore de diretórios

```
menotti@fradim:~/cursos$ cd ci066
menotti@fradim:~/cursos/ci066$ cd ..
menotti@fradim:~/cursos$ cd ~
menotti@fradim:~$ cd ci066
-bash: cd: ci066: Arquivo ou diretório não encontrado
menotti@fradim:~$ cd cursos
menotti@fradim:~/cursos$ cd ci066
menotti@fradim:~/cursos/ci066$ cd
menotti@fradim:~$ cd cursos/ci066
menotti@fradim:~/cursos/ci066$ █
```

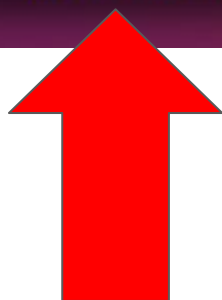
Gerenciador de Arquivos



Hello World!

- Compilando e executando
 - `fpc helloworld.pas`
 - `./helloworld`

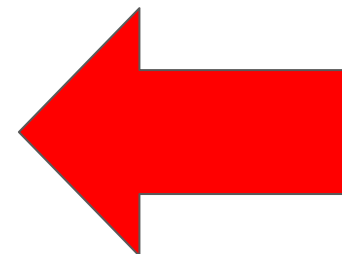
```
menotti@fradim:~/cursos/ci066$ fpc helloworld.pas
Free Pascal Compiler version 3.0.0+dfsg-2 [2016/01/28] for x86_64
Copyright (c) 1993-2015 by Florian Klaempfl and others
Target OS: Linux for x86-64
Compiling helloworld.pas
Linking helloworld
/usr/bin/ld.bfd: aviso: link.res contém seções de saída; você se esqueceu -T?
5 lines compiled, 0.6 sec
menotti@fradim:~/cursos/ci066$ ./helloworld
Hello Worldmenotti@fradim:~/cursos/ci066$
```



Hello World!

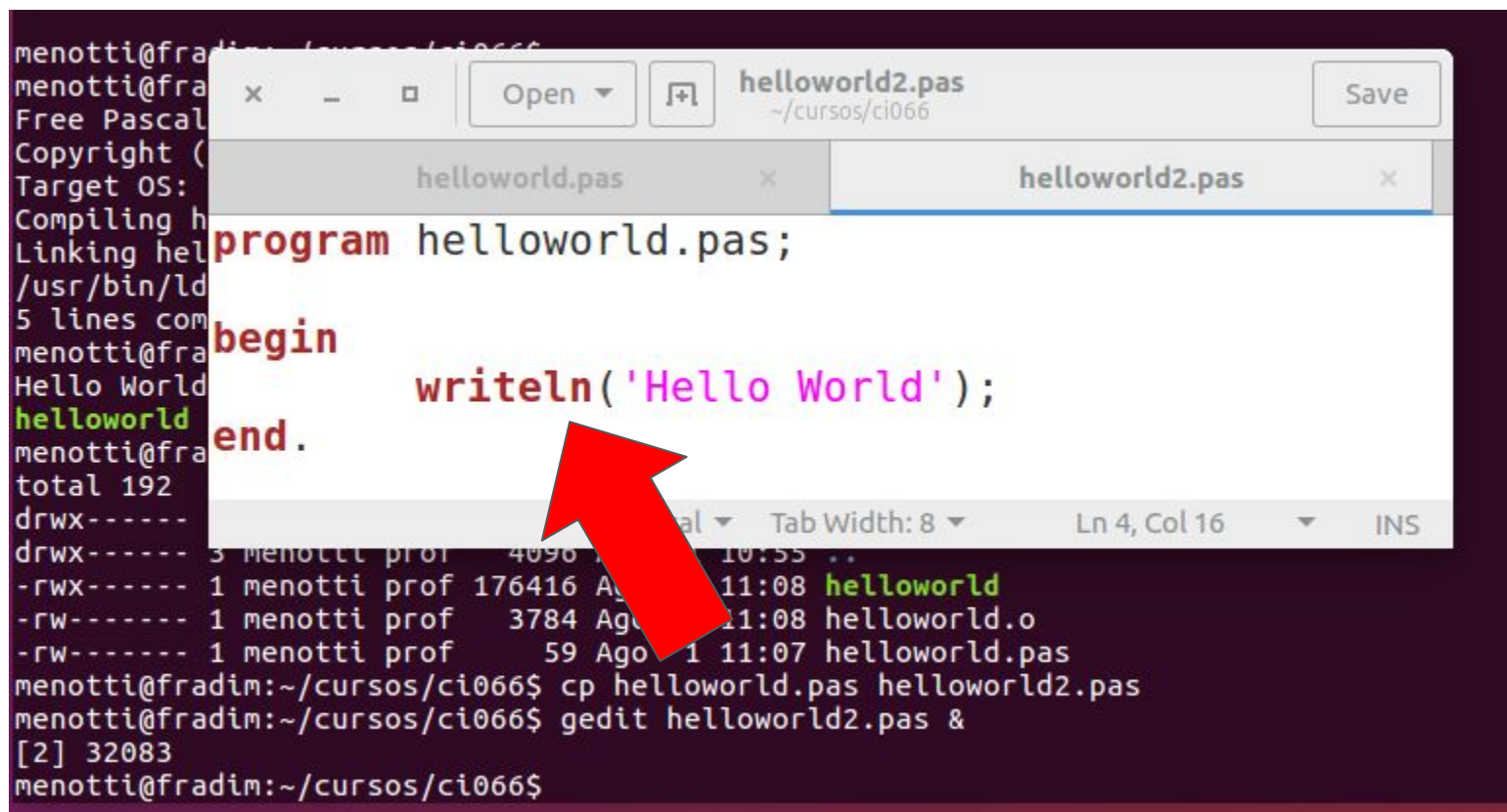
- Listando conteúdo do diretório / pasta
 - ls
 - ls -la

```
Hello Worldmenotti@fradim:~/cursos/ci066$ ls
helloworld helloworld.o helloworld.pas
menotti@fradim:~/cursos/ci066$ ls -la
total 192
drwx----- 2 menotti prof  4096 Ago  1 11:08 .
drwx----- 3 menotti prof  4096 Ago  1 10:55 ..
-rwx----- 1 menotti prof 176416 Ago  1 11:08 helloworld
-rw----- 1 menotti prof   3784 Ago  1 11:08 helloworld.o
-rw----- 1 menotti prof     59 Ago  1 11:07 helloworld.pas
menotti@fradim:~/cursos/ci066$
```



Hello World 2

- Quebrando Linha (**writeln**)
 - `cp helloworld.pas helloworld2.pas` (criando uma cópia de helloworld.pas)
 - `gedit helloworld2.pas`

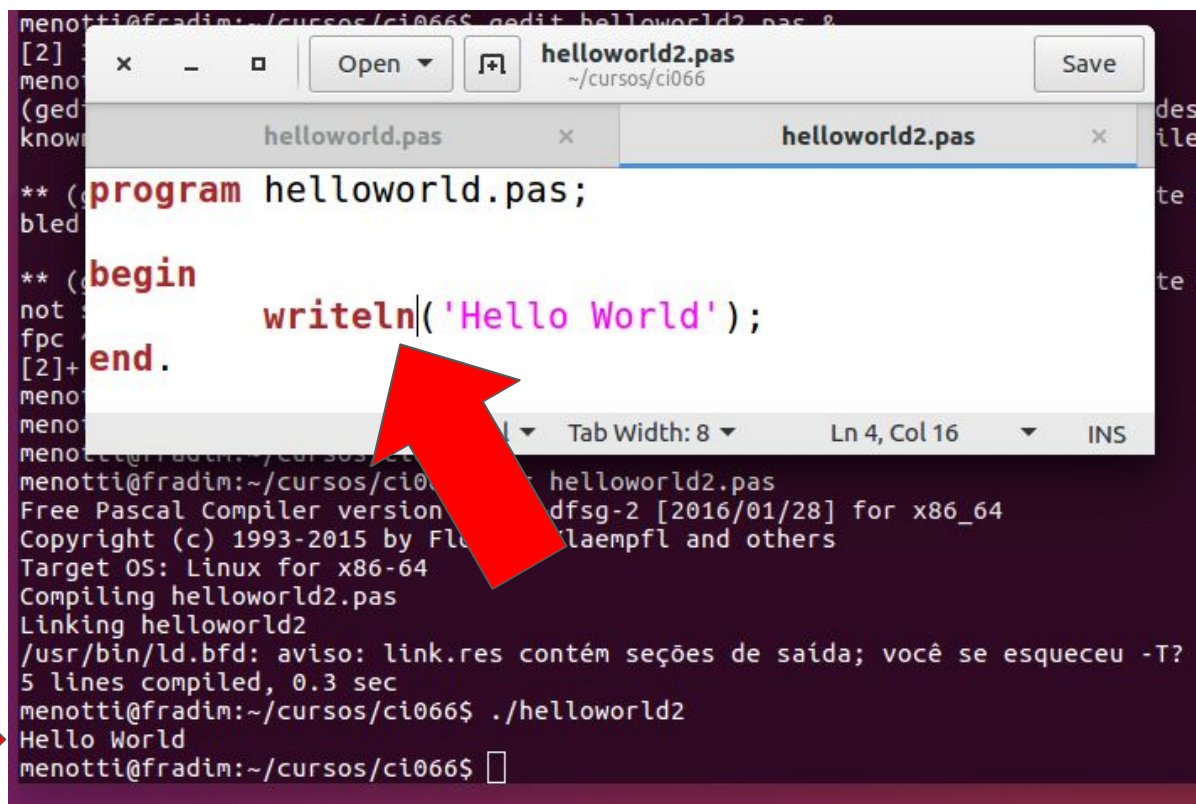


```
menotti@fradim:~/cursos/ci066$ cp helloworld.pas helloworld2.pas
menotti@fradim:~/cursos/ci066$ gedit helloworld2.pas &
Free Pascal
Copyright (c) 2005-2013 Free Pascal Development Team
Target OS: Linux
Compiling helloworld2.pas
Linking helloworld2.pas
/usr/bin/ld: warning: helloworld2.pas: file not recognized: file format not recognized
5 lines compiled
menotti@fradim:~/cursos/ci066$ ./helloworld2.pas
Hello World
helloworld
menotti@fradim:~/cursos/ci066$ ls -la
total 192
drwx----- 3 menotti prof 4096 Ago 11 10:55 ..
-rwx----- 1 menotti prof 176416 Ago 11 11:08 helloworld
-rw----- 1 menotti prof 3784 Ago 11 11:08 helloworld.o
-rw----- 1 menotti prof 59 Ago 11 11:07 helloworld.pas
menotti@fradim:~/cursos/ci066$ cp helloworld.pas helloworld2.pas
menotti@fradim:~/cursos/ci066$ gedit helloworld2.pas &
[2] 32083
menotti@fradim:~/cursos/ci066$
```

```
helloworld2.pas
program helloworld.pas;
begin
    writeln('Hello World');
end.
```

Hello World 2

- Compilando e executando
 - `fpc helloworld2.pas`
 - `./helloworld2`



```
menotti@fradim:~/cursos/ci066$ fpc helloworld2.pas &
[2]
menotti@fradim:~/cursos/ci066$ ./helloworld2
Hello World
menotti@fradim:~/cursos/ci066$
```

The screenshot shows a terminal window with a code editor open. The code editor displays the following Pascal code:

```
** (program helloworld.pas;
begin
    writeln('Hello World');
end.
```

The terminal output shows the compilation process:

```
Free Pascal Compiler version 3.0.2 [2016/01/28] for x86_64
Copyright (c) 1993-2015 by Florian Klaempfl and others
Target OS: Linux for x86-64
Compiling helloworld2.pas
Linking helloworld2
/usr/bin/ld.bfd: aviso: link.res contém seções de saída; você se esqueceu -T?
5 lines compiled, 0.3 sec
menotti@fradim:~/cursos/ci066$ ./helloworld2
Hello World
menotti@fradim:~/cursos/ci066$
```

Two red arrows are present: one pointing to the `fpc helloworld2.pas` command in the terminal, and another pointing to the `./helloworld2` command in the terminal.

Somando dois valores

- Editando arquivo **soma2.pas**
 - `gedit soma2.pas &`



```
bled not supported
** (g
not s
fpc
[2]+
meno
meno
meno
Free
Copy
Targ
Comp
Link
/usr
5 li
meno
Hello
menotti@fradim:~/cursos/ci066$ gedit soma2.pas
```

```

x - □ Open ▾ [+] soma2.pas ~/cursos/ci066 Save
helloworld.pas x helloworld2.pas x soma2.pas x
program soma2.pas;
var a,b: integer;

begin
    read(a);
    read(b);
    write(a+b);
end.
```

Pascal ▾ Tab Width: 8 ▾ Ln 1, Col 1 ▾ INS

Compilando e executando

- `fpc soma2.pas`

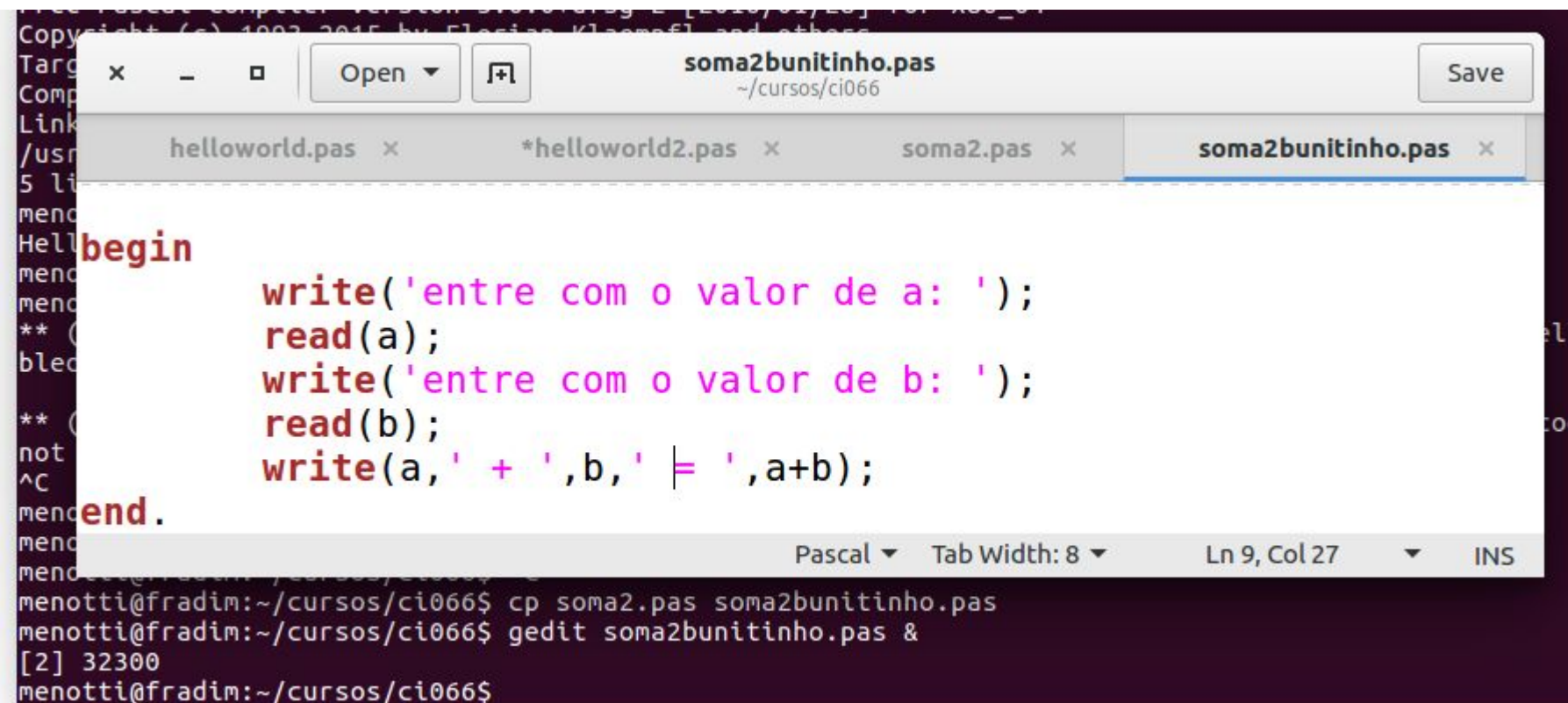
```
menotti@menotti-VPCS11M1E:~/tmp/fpc$ fpc soma2.pas
Free Pascal Compiler version 3.0.0+dfsg-2 [2016/01/28] for x86_64
Copyright (c) 1993-2015 by Florian Klaempfl and others
Target OS: Linux for x86-64
Compiling soma2.pas
Linking soma2
/usr/bin/ld.bfd: warning: link.res contains output sections; did you forget -T?
8 lines compiled, 0.1 sec
menotti@menotti-VPCS11M1E:~/tmp/fpc$ █
```

- `./soma2`

```
menotti@menotti-VPCS11M1E:~/tmp/fpc$ ./soma2
2
3
5menotti@menotti-VPCS11M1E:~/tmp/fpc$ █
```

Agora com interface amigável

- Editando arquivo **soma2.pas**
 - `cp soma2.pas soma2bunitinho.pas`
 - `gedit soma2bunitinho.pas &`



The screenshot shows a terminal window with a dark background. At the top, a window titled "soma2bunitinho.pas" is open, displaying the contents of the file. The code is as follows:

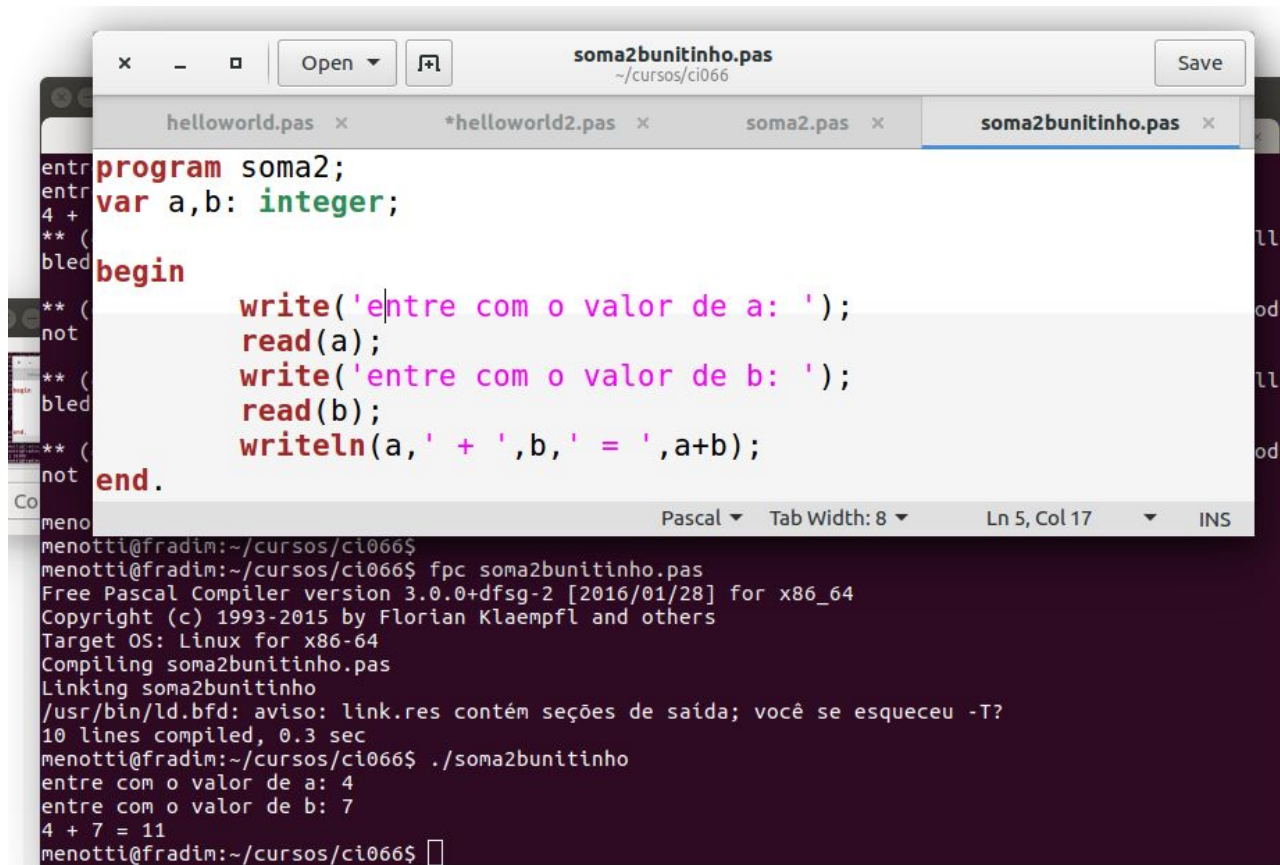
```
begin
    write('entre com o valor de a: ');
    read(a);
    write('entre com o valor de b: ');
    read(b);
    write(a, ' + ', b, ' = ', a+b);
end.
```

Below the window, the terminal shows the following commands and their output:

```
menotti@fradim:~/cursos/ci066$ cp soma2.pas soma2bunitinho.pas
menotti@fradim:~/cursos/ci066$ gedit soma2bunitinho.pas &
[2] 32300
menotti@fradim:~/cursos/ci066$
```

Agora com interface amigável

- Resultado
 - `fpc soma2bunitinho.pas`
 - `./soma2bunitinho`



The image shows a code editor window titled "soma2bunitinho.pas" with the following code:

```
program soma2;  
var a,b: integer;  
  
begin  
    write('entre com o valor de a: ');  
    read(a);  
    write('entre com o valor de b: ');  
    read(b);  
    writeln(a, ' + ', b, ' = ', a+b);  
end.
```

Below the code editor is a terminal window showing the compilation and execution of the program:

```
menotti@fradim:~/cursos/ci0665  
menotti@fradim:~/cursos/ci0665$ fpc soma2bunitinho.pas  
Free Pascal Compiler version 3.0.0+dfsg-2 [2016/01/28] for x86_64  
Copyright (c) 1993-2015 by Florian Klaempfl and others  
Target OS: Linux for x86_64  
Compiling soma2bunitinho.pas  
Linking soma2bunitinho  
/usr/bin/ld.bfd: aviso: link.res contém seções de saída; você se esqueceu -T?  
10 lines compiled, 0.3 sec  
menotti@fradim:~/cursos/ci0665$ ./soma2bunitinho  
entre com o valor de a: 4  
entre com o valor de b: 7  
4 + 7 = 11  
menotti@fradim:~/cursos/ci0665$
```

Diretório / Pasta

- Visualizando (ls → list)
 - ls
 - ls -la

```
menotti@fradim:~/cursos/ci066$ ls
bhaskara      bhaskara2.pas  helloworld    helloworld2.pas  soma2bunitinho  soma2.pas
bhaskara2    bhaskara.o     helloworld2   helloworld.o     soma2bunitinho.o
bhaskara2.o  bhaskara.pas  helloworld2.o helloworld.pas   soma2bunitinho.pas
menotti@fradim:~/cursos/ci066$ ls -la
total 944
drwx----- 2 menotti prof   4096 Ago  1 11:46 .
drwx----- 3 menotti prof   4096 Ago  1 10:55 ..
-rwx----- 1 menotti prof 176688 Ago  1 11:45 bhaskara
-rwx----- 1 menotti prof 176896 Ago  1 11:46 bhaskara2
-rw----- 1 menotti prof   6808 Ago  1 11:46 bhaskara2.o
-rw----- 1 menotti prof    281 Ago  1 11:45 bhaskara2.pas
-rw----- 1 menotti prof   5464 Ago  1 11:45 bhaskara.o
-rw----- 1 menotti prof    219 Ago  1 11:44 bhaskara.pas
-rwx----- 1 menotti prof 176416 Ago  1 11:08 helloworld
-rwx----- 1 menotti prof 176416 Ago  1 11:15 helloworld2
-rw----- 1 menotti prof   3784 Ago  1 11:15 helloworld2.o
-rw----- 1 menotti prof    61 Ago  1 11:12 helloworld2.pas
-rw----- 1 menotti prof   3784 Ago  1 11:08 helloworld.o
-rw----- 1 menotti prof    59 Ago  1 11:07 helloworld.pas
-rwx----- 1 menotti prof 176816 Ago  1 11:34 soma2bunitinho
-rw----- 1 menotti prof   6008 Ago  1 11:34 soma2bunitinho.o
-rw----- 1 menotti prof    168 Ago  1 11:34 soma2bunitinho.pas
-rw----- 1 menotti prof    82 Ago  1 11:19 soma2.pas
menotti@fradim:~/cursos/ci066$
```

Equação do 2o grau - Bhaskara

- Editando **bhaskara.pas**
 - `gedit bhaskara.pas &`



```
program bhaskara;
var b, c, raizdiscriminante: real;

begin
    read(b);
    read(c);
    raizdiscriminante := sqrt( b*b - 4*c);
    write( (b - raizdiscriminante) / 2 );
    write( (b + raizdiscriminante) / 2 );
end.
```

The screenshot shows a code editor window titled "bhaskara.pas" with the file path "~/cursos/ci066". The editor contains the following Pascal code for solving a quadratic equation. The code is color-coded: keywords are in red, variables and constants in black, and the `sqrt` function and its arguments are in green. The `write` statements use pink for the denominator `2`. The status bar at the bottom indicates the language is Pascal, tab width is 8, and the cursor is at line 1, column 18.

Equação do 2o grau - Bhaskara

- Compilando
 - fpc bhaskara.pas
 - ./bhaskara

```
menotti@fradim:~/cursos/ci066$ fpc bhaskara.pas
Free Pascal Compiler version 3.0.0+dfsg-2 [2016/01/28] for x86_64
Copyright (c) 1993-2015 by Florian Klaempfl and others
Target OS: Linux for x86-64
Compiling bhaskara.pas
Linking bhaskara
/usr/bin/ld.bfd: aviso: link.res contém seções de saída; você se esqueceu -T?
10 lines compiled, 0.2 sec
menotti@fradim:~/cursos/ci066$
menotti@fradim:~/cursos/ci066$
menotti@fradim:~/cursos/ci066$ ./bhaskara
-4
4
-2.0000000000000000E+000
-2.0000000000000000E+000
```

Equação do 2o grau - Bhaskara

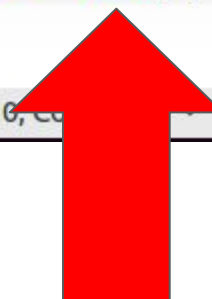
- Exercício
 - Como deixar a interface amigável?

```
< soma2.pas x soma2bunitinho.pas x bhaskara.pas x bhaskara2.pas x >
program bhaskara;
var b, c, raizdiscriminante: real;

begin
    write('entre com b: ');
    read(b);
    write('entre com c: ');
    read(c);
    raizdiscriminante := sqrt( b*b - 4*c);
    writeln('x1 = ', (b - raizdiscriminante) / 2 :5:4);
    writeln('x2 = ', (b + raizdiscriminante) / 2 :5:4);
end.

Pascal Tab Width: 8 Ln 10, Col 10 INS
```

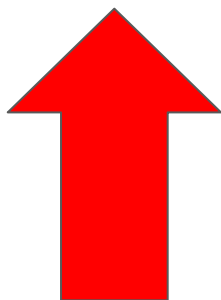
5 casas/algarismos
+ 4 casas decimais



Equação do 2o grau - Bhaskara

- Compilando e executando
 - fpc bhaskara2.pas
 - ./bhaskara2

```
menotti@fradim:~/cursos/ci066$ fpc bhaskara2.pas
Free Pascal Compiler version 3.0.0+dfsg-2 [2016/01/28] for x86_64
Copyright (c) 1993-2015 by Florian Klaempfl and others
Target OS: Linux for x86-64
Compiling bhaskara2.pas
Linking bhaskara2
/usr/bin/ld.bfd: aviso: link.res contém seções de saída; você se esqueceu -T?
12 lines compiled, 0.6 sec
menotti@fradim:~/cursos/ci066$ ./bhaskara2
entre com b: -4
entre com c: 4
x1 = -2.0000
x2 = -2.0000
menotti@fradim:~/cursos/ci066$ █
```



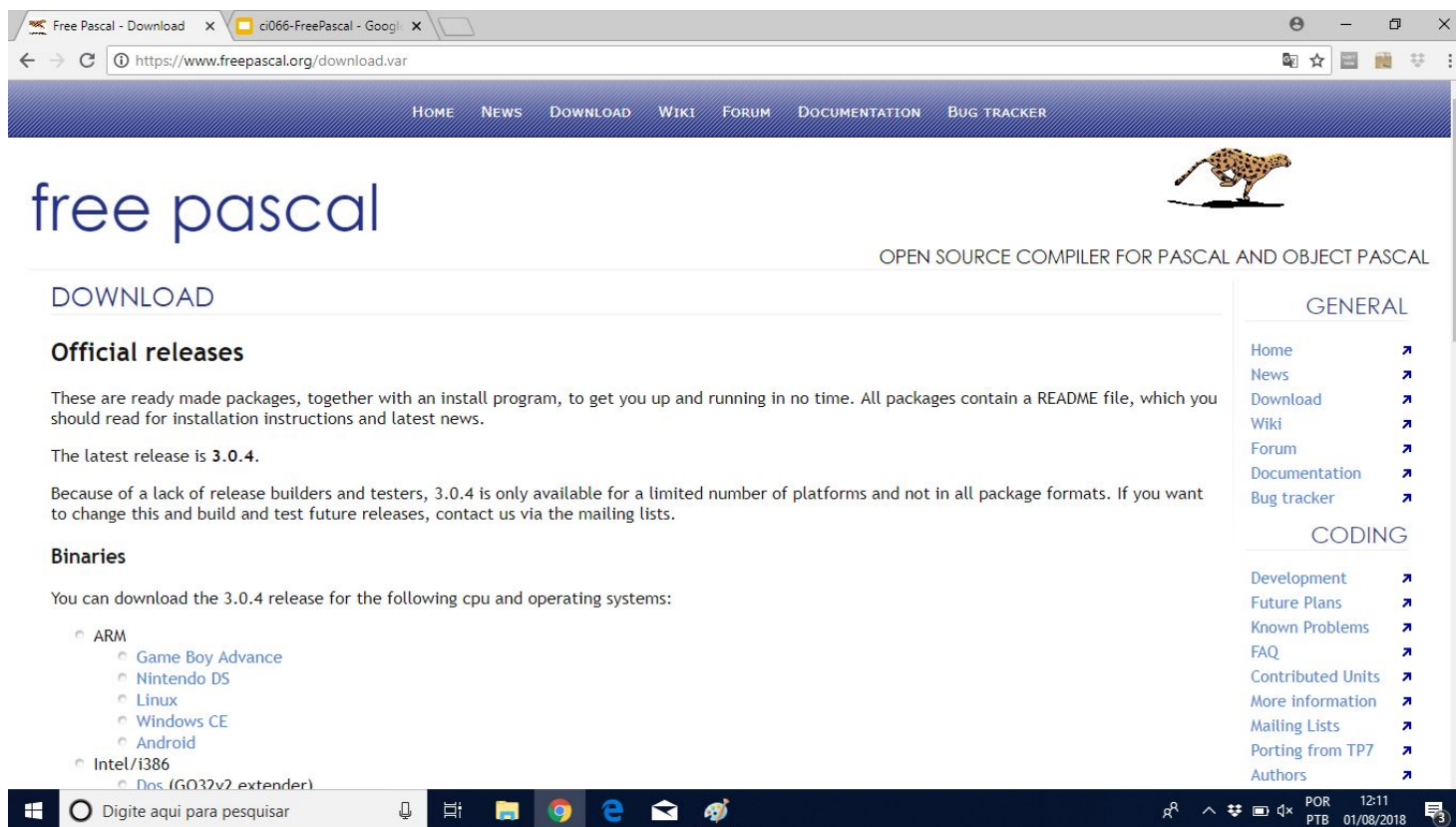
5 casas/algarismos
+
4 casas decimais

Equação do 2o grau - Bhaskara

- Exercício
 - Inserir **a** no programa
 - $a.x^2 + b.x + c = 0$

FreePascal - Windows (em casa)

- Como instalar
 - <https://www.freepascal.org/download.var>



The screenshot shows a web browser window displaying the Free Pascal website. The browser's address bar shows the URL <https://www.freepascal.org/download.var>. The website has a blue header with navigation links: HOME, NEWS, DOWNLOAD, WIKI, FORUM, DOCUMENTATION, and BUG TRACKER. The main content area features the text "free pascal" in a large blue font, with a cheetah logo to the right. Below this, it says "OPEN SOURCE COMPILER FOR PASCAL AND OBJECT PASCAL". The page is divided into sections: "DOWNLOAD" with "Official releases" and "Binaries" subsections, and a "GENERAL" sidebar with links to Home, News, Download, Wiki, Forum, Documentation, and Bug tracker. The "CODING" sidebar includes links to Development, Future Plans, Known Problems, FAQ, Contributed Units, More information, Mailing Lists, Porting from TP7, and Authors. The Windows taskbar at the bottom shows the search bar with the text "Digite aqui para pesquisar" and the system tray with the date and time "POR 12:11 PTB 01/08/2018".

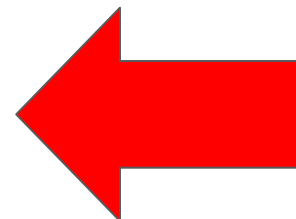
FreePascal - Windows (em casa)

- **Arquitetura**

- **32 bits ou**

- Intel/i386

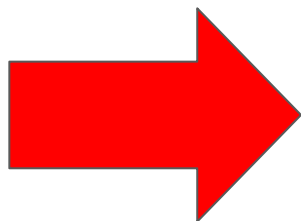
- Dos (GO32v2 extender)
 - FreeBSD
 - Linux
 - Mac OS X (and cross-compilers for PowerPC(64)/Mac OS X, iOS & iPhon
 - Haiku
 - OS/2 (and eComStation)
 - Solaris
 - Windows 32-bit (and a cross-compiler ARM/MIPS/i386-Android)
 - Android



- **64 bits**

- AMD64/Intel 64/x86_64

- FreeBSD
 - Linux
 - Solaris
 - Windows 64-bit



FreePascal - Windows (em casa)

Win64



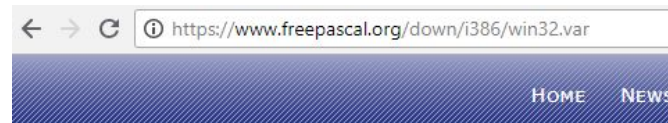
free pascal

SELECT DOWNLOAD MIRROR

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- Austria
- Hungary
- Netherlands

Win32



free pascal

SELECT DOWNLOAD MIRROR

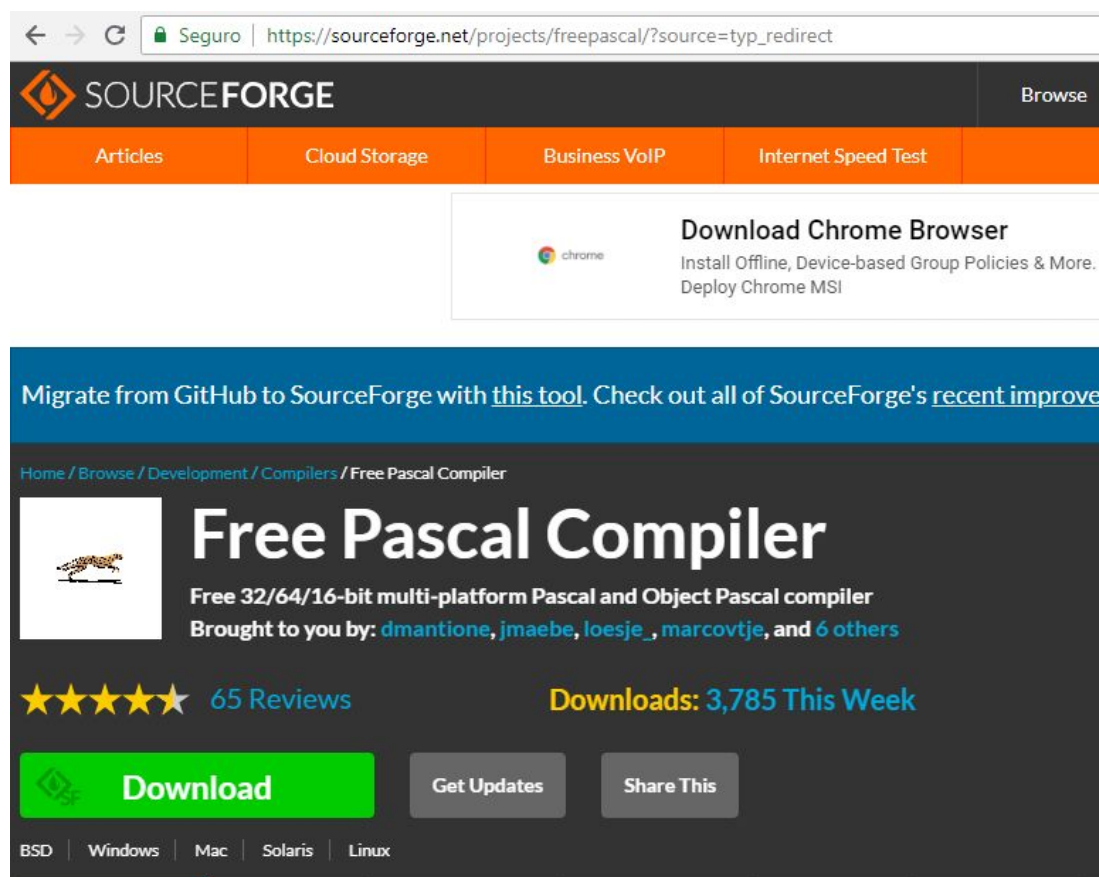
Please select the site from which you want to download:

- SourceForge
- Austria
- Hungary
- Netherlands



FreePascal - Windows (em casa)


- Baixar executável & executá-lo



← → ↻ Seguro | https://sourceforge.net/projects/freepascal/?source=typ_redirect


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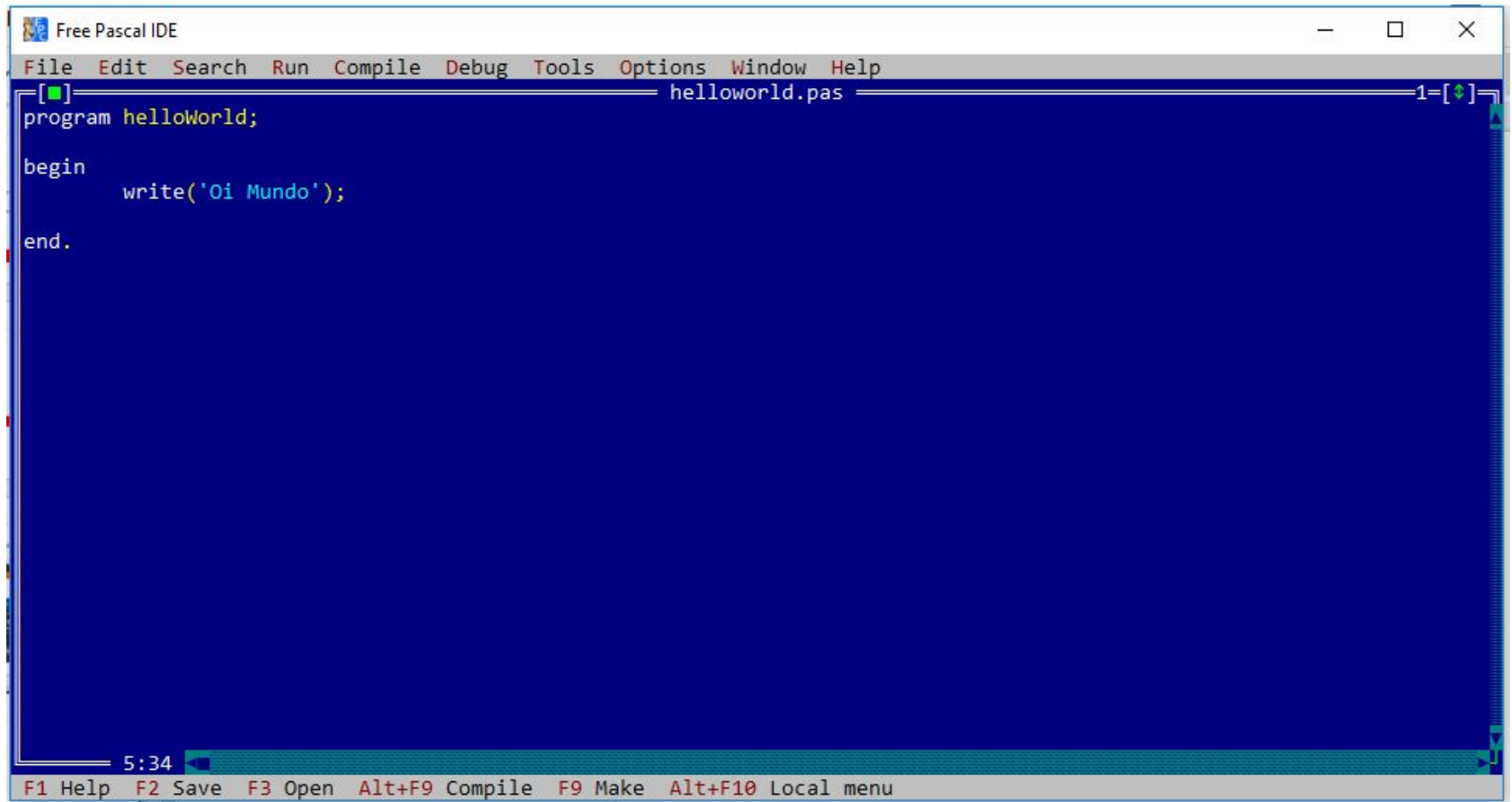
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FreePascal - Windows (em casa)

- O ambiente



The image shows a screenshot of the Free Pascal IDE window. The title bar reads "Free Pascal IDE". The menu bar includes "File", "Edit", "Search", "Run", "Compile", "Debug", "Tools", "Options", "Window", and "Help". The main editor area has a dark blue background and contains the following Pascal code:

```
program helloWorld;  
begin  
    write('Oi Mundo');  
end.
```

The status bar at the bottom shows the time "5:34" and a series of function key shortcuts: "F1 Help", "F2 Save", "F3 Open", "Alt+F9 Compile", "F9 Make", and "Alt+F10 Local menu".

Referências

- Castilho, Silva & Weingaertner,
Algoritmos e Estruturas de Dados I,
<http://www.inf.ufpr.br/cursos/ci055/apostila.pdf>, 2015
- Wiki FreePascal,
Formatting Ouput,
http://wiki.freepascal.org/Formatting_output,
acessado em ago/2018