

EPAM University Programs
DevOps external course
Module 4 DevOps Introduction
TASK 4.2

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1. Set up Linux Virtual Machine in VirtualBox.
2. Familiarize yourself with the commands and utilities listed in the presentation (switching between **virtual terminals** (consoles); **printenv**; content of **/etc/profile** and **~/.bash_profile**, **\$echo \$HISTFILE \$HISTSIZE \$HISTFILESIZE**, **who**, **w**, **whoami**, **id**). Make 5 screenshots.

(ctrl +) Alt+F? (где «?» – это 1/2/..) – позволяет переключаться между терминалами, команда **ls -l /dev/tty?** Позволяет посмотреть список доступных терминалов.

```
Ubuntu 18.04.4 LTS mariia-VirtualBox tty4
mariia-VirtualBox login: mariia
Password:
Last login: Thu Apr  9 16:07:17 EEST 2020 on tty3
Welcome to Ubuntu 18.04.4 LTS (GNU/Linux 5.3.0-46-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

 * Kubernetes 1.18 GA is now available! See https://microk8s.io for docs or
   install it with:

   sudo snap install microk8s --channel=1.18 --classic

 * Multipass 1.1 adds proxy support for developers behind enterprise
   firewalls. Rapid prototyping for cloud operations just got easier.

   https://multipass.run/

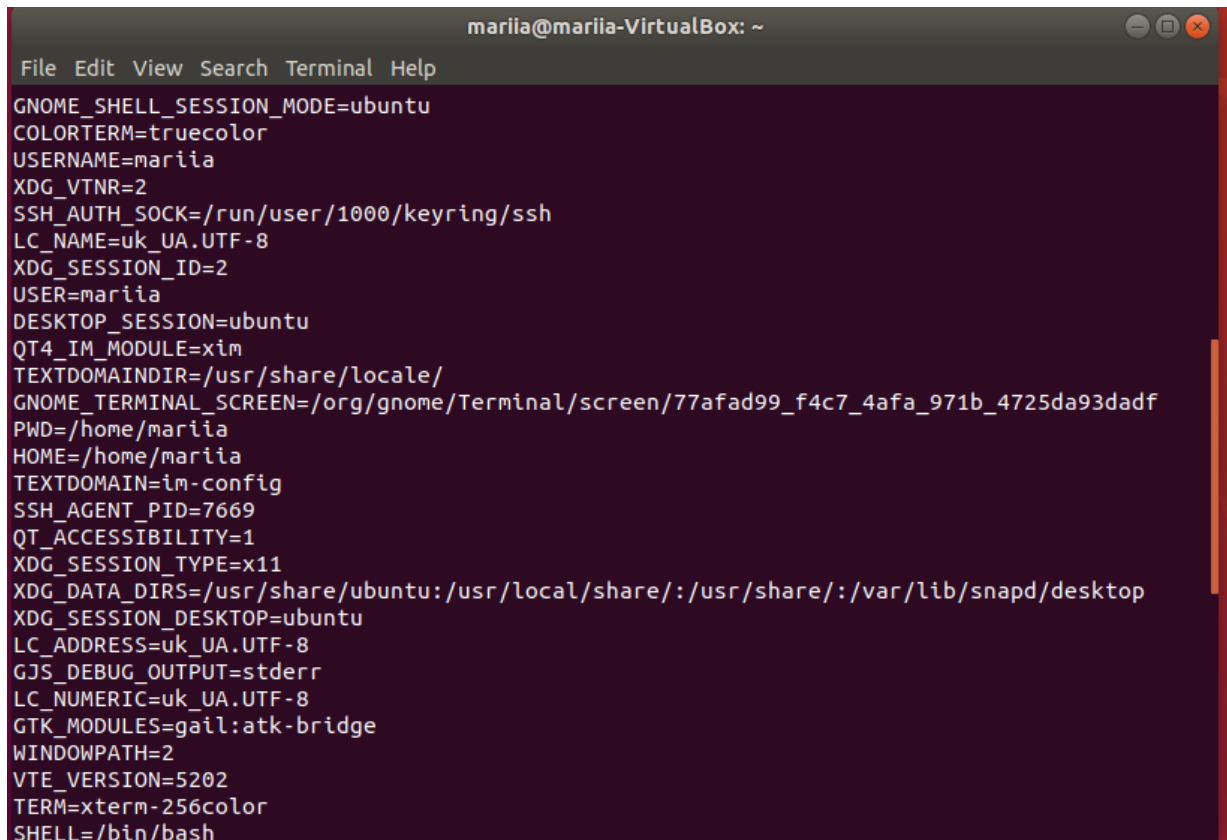
 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch

47 packages can be updated.
0 updates are security updates.

Your Hardware Enablement Stack (HWE) is supported until April 2023.
mariia@mariia-VirtualBox:~$ ls
Desktop    Downloads    mybox.tar      NanofileMariiaBack  snap      Videos
documents  examples.desktop  Nanoback.txt    Pictures             Templates
Documents  Music          NanofileMariia  Public              ubuntu.tar
mariia@mariia-VirtualBox:~$
```

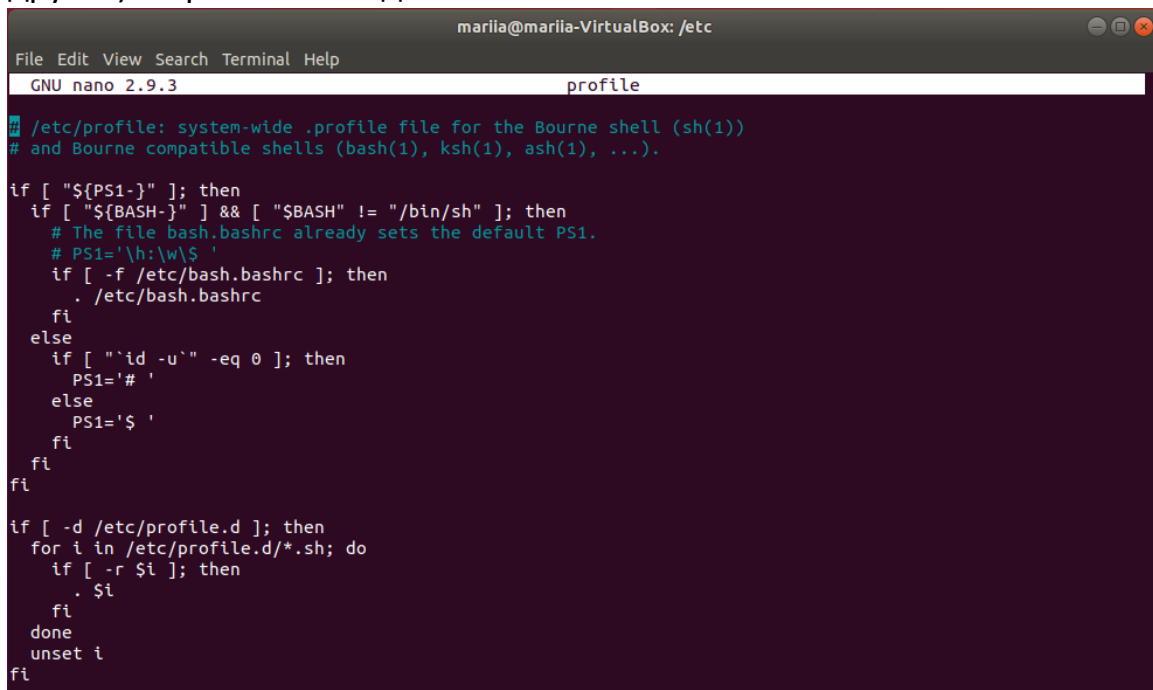
```
mariia@mariia-VirtualBox:~$ ls -l /dev/tty?
crw-rw---- 1 root   tty  4, 0 kBi  9 16:01 /dev/tty0
crw-rw---- 1 gdm    tty  4, 1 kBi  9 16:01 /dev/tty1
crw-rw---- 1 mariia tty  4, 2 kBi  9 16:01 /dev/tty2
crw-rw---- 1 mariia tty  4, 3 kBi  9 16:07 /dev/tty3
crw-rw---- 1 mariia tty  4, 4 kBi  9 16:08 /dev/tty4
crw-rw---- 1 root   tty  4, 5 kBi  9 16:01 /dev/tty5
crw-rw---- 1 root   tty  4, 6 kBi  9 16:01 /dev/tty6
crw-rw---- 1 root   tty  4, 7 kBi  9 16:01 /dev/tty7
crw-rw---- 1 root   tty  4, 8 kBi  9 16:01 /dev/tty8
crw-rw---- 1 root   tty  4, 9 kBi  9 16:01 /dev/tty9
mariia@mariia-VirtualBox:~$
```

Команда `printenv` позволяет посмотреть заданные переменные. Например, в данном случае значение переменной `USERNAME` – это `maria`:



```
maria@maria-VirtualBox: ~
File Edit View Search Terminal Help
GNOME_SHELL_SESSION_MODE=ubuntu
COLORTERM=truecolor
USERNAME=maria
XDG_VTNR=2
SSH_AUTH_SOCK=/run/user/1000/keyring/ssh
LC_NAME=uk_UA.UTF-8
XDG_SESSION_ID=2
USER=maria
DESKTOP_SESSION=ubuntu
QT4_IM_MODULE=xim
TEXTDOMAINDIR=/usr/share/locale/
GNOME_TERMINAL_SCREEN=/org/gnome/Terminal/screen/77afad99_f4c7_4afa_971b_4725da93dadf
PWD=/home/maria
HOME=/home/maria
TEXTDOMAIN=im-config
SSH_AGENT_PID=7669
QT_ACCESSIBILITY=1
XDG_SESSION_TYPE=x11
XDG_DATA_DIRS=/usr/share/ubuntu:/usr/local/share/:/usr/share/:/var/lib/snapd/desktop
XDG_SESSION_DESKTOP=ubuntu
LC_ADDRESS=uk_UA.UTF-8
GJS_DEBUG_OUTPUT=stderr
LC_NUMERIC=uk_UA.UTF-8
GTK_MODULES=gail:atk-bridge
WINDOWPATH=2
VTE_VERSION=5202
TERM=xterm-256color
SHELL=/bin/bash
```

Файл `/etc/profile` содержит файлы запуска для login shell session (`bash`, `ksh` и другие) и применяется для всех пользователей.



```
maria@maria-VirtualBox: /etc
File Edit View Search Terminal Help
GNU nano 2.9.3 profile
/etc/profile: system-wide .profile file for the Bourne shell (sh(1))
# and Bourne compatible shells (bash(1), ksh(1), ash(1), ...).

if [ "${PS1-}" ]; then
  if [ "${BASH-}" ] && [ "$BASH" != "/bin/sh" ]; then
    # The file bash.bashrc already sets the default PS1.
    # PS1='\h:\w\$ '
    if [ -f /etc/bash.bashrc ]; then
      . /etc/bash.bashrc
    fi
  else
    if [ "`id -u`" -eq 0 ]; then
      PS1='# '
    else
      PS1='$ '
    fi
  fi
fi

if [ -d /etc/profile.d ]; then
  for i in /etc/profile.d/*.sh; do
    if [ -r $i ]; then
      . $i
    fi
  done
unset i
fi
```

`~/.`profile определяет дополнительные настройки для конкретного пользователя, `bash` читает этот файл, т.к. нет `bash_login` и `bash_profile`:

```
mc [marila@marila-VirtualBox]:~
File Edit View Search Terminal Help
GNU nano 2.9.3 .profile

# ~/.profile: executed by the command interpreter for login shells.
# This file is not read by bash(1), if ~/.bash_profile or ~/.bash_login
# exists.
# see /usr/share/doc/bash/examples/startup-files for examples.
# the files are located in the bash-doc package.

# the default umask is set in /etc/profile; for setting the umask
# for ssh logins, install and configure the libpam-umask package.
#umask 022

# if running bash
if [ -n "$BASH_VERSION" ]; then
    # include .bashrc if it exists
    if [ -f "$HOME/.bashrc" ]; then
        . "$HOME/.bashrc"
    fi
fi

# set PATH so it includes user's private bin if it exists
if [ -d "$HOME/bin" ] ; then
    PATH="$HOME/bin:$PATH"
fi

# set PATH so it includes user's private bin if it exists
if [ -d "$HOME/.local/bin" ] ; then
    PATH="$HOME/.local/bin:$PATH"
fi
```

Переменная `$HISTFILE` содержит название файла истории и путь к нему, `$HISTSIZE` указывает на максимальное количество команд, которые могут храниться в памяти, а `$HISTFILESIZE` - указывает на максимальное количество строк файла истории, в данном случае их может быть до 2000:

```
marila@marila-VirtualBox:~$ echo $HISTFILE $HISTSIZE $HISTFILESIZE
/home/marila/.bash_history 1000 2000
```

Команды `who`, `w`, `whoami` и `id` позволяют получить информацию об активных пользователях. `Who` показывает, какими пользователями какие терминалы открыты и в какое время. `w` тоже позволяет узнать эту информацию, но дает еще более подробные данные (например, данные о процессах и времени их использования). `Whoami` позволяет узнать имя текущего пользователя. `Id` отображает идентификатор пользователя и его имя, информацию о группе пользователей, в которой он состоит и т.д.

```

maria@maria-VirtualBox:~$ who
maria  :0                2020-04-09 16:03 (:0)
maria  tty4              2020-04-09 16:08
maria@maria-VirtualBox:~$ w
 17:08:31 up  1:07,  2 users,  load average: 0,00, 0,07, 0,15
USER    TTY      FROM             LOGIN@   IDLE   JCPU   PCPU   WHAT
maria    :0                :0        16:03    ?xdm?   5:16   0.00s  /usr/lib/gdm3/gdm-x-session --run-script en
maria    tty4          -         16:08    59:35   0.04s   0.04s  -bash
maria@maria-VirtualBox:~$ whoami
maria
maria@maria-VirtualBox:~$ id
uid=1000(maria) gid=1000(maria) groups=1000(maria),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),116(lpadmin),126(sambashare),998(lxd)

```

3. Familiarize yourself with the commands (*uname*, *hostname*, *uptime*, *shutdown*, *halt*, *reboot*, *init...*). Make 5 screenshots.

Команда *uname* позволяет получить информацию о версии ядра (-r), процессоре (-p) и т.д. То есть, показывает информацию о машине и операционной системе.

```

maria@maria-VirtualBox:~$ uname -r
5.3.0-46-generic
maria@maria-VirtualBox:~$ uname -p
x86_64

```

hostname указывает на имя компьютера в сети

```

maria@maria-VirtualBox:~$ hostname
maria-VirtualBox

```

Время работы устройства с момента загрузки можно узнать с помощью *uptime* (показатель после *up*). Также показывает текущее время, количество залогиненных пользователей и некоторую информацию о нагрузке, которую осуществляют процессы на систему.

```

maria@maria-VirtualBox:~$ uptime
 17:25:40 up  1:24,  2 users,  load average: 0,08, 0,09, 0,11

```

halt - позволяет приостановить все функции процессора, но оставляет его включенным.

Init – отправляет команды демону *init* (процесс, работающий в фоновом режиме)

Shutdown – позволяет выключить компьютер (при необходимости – в определенное время)

Reboot – перезагружает компьютер

```

maria@maria-VirtualBox: ~
File Edit View Search Terminal Help
maria@maria-VirtualBox:~$ shutdown -h 18:14
shutdown scheduled for Thu 2020-04-09 18:14:00 EEST, use 'shutdown -c' to cancel

```

```

maria@maria-VirtualBox:~$ init --help
init [OPTIONS...] {COMMAND}

Send control commands to the init daemon.

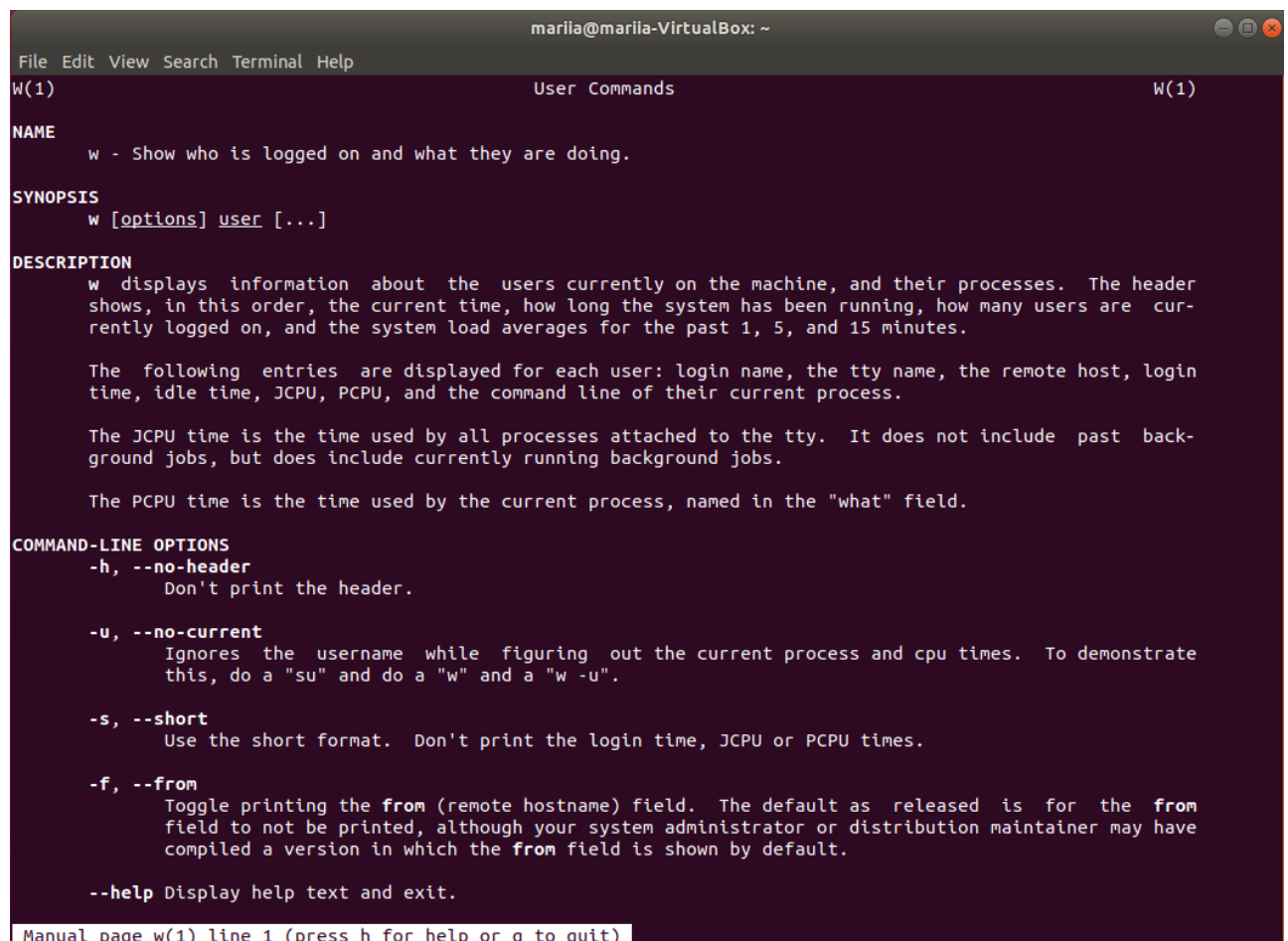
    --help      Show this help
    --no-wall   Don't send wall message before halt/power-off/reboot

Commands:
    0           Power-off the machine
    6           Reboot the machine
    2, 3, 4, 5  Start runlevelX.target unit
    1, s, S     Enter rescue mode
    q, Q        Reload init daemon configuration
    u, U        Reexecute init daemon
maria@maria-VirtualBox:~$ init 6

```

4. Familiarize yourself with the help commands (*man, info, find, locate, whereis, less/zless in /usr/share/doc*). Make 5 screenshots.

Man и info показывают документацию про указанную команду, возможные параметры и прочую полезную информацию.



```

maria@maria-VirtualBox: ~
File Edit View Search Terminal Help
w(1) User Commands W(1)
NAME
    w - Show who is logged on and what they are doing.
SYNOPSIS
    w [options] user [...]
DESCRIPTION
    w displays information about the users currently on the machine, and their processes. The header shows, in this order, the current time, how long the system has been running, how many users are currently logged on, and the system load averages for the past 1, 5, and 15 minutes.

    The following entries are displayed for each user: login name, the tty name, the remote host, login time, idle time, JCPU, PCPU, and the command line of their current process.

    The JCPU time is the time used by all processes attached to the tty. It does not include past background jobs, but does include currently running background jobs.

    The PCPU time is the time used by the current process, named in the "what" field.
COMMAND-LINE OPTIONS
    -h, --no-header
        Don't print the header.

    -u, --no-current
        Ignores the username while figuring out the current process and cpu times. To demonstrate this, do a "su" and do a "w" and a "w -u".

    -s, --short
        Use the short format. Don't print the login time, JCPU or PCPU times.

    -f, --from
        Toggle printing the from (remote hostname) field. The default as released is for the from field to not be printed, although your system administrator or distribution maintainer may have compiled a version in which the from field is shown by default.

    --help
        Display help text and exit.
Manual page w(1) line 1 (press h for help or q to quit)

```

```
maria@maria-VirtualBox: ~
File Edit View Search Terminal Help
W(1) User Commands W(1)
NAME
w - Show who is logged on and what they are doing.
SYNOPSIS
w [options] user [...]
DESCRIPTION
w displays information about the users currently on the machine, and their processes. The header shows, in this order, the current time, how long the system has been running, how many users are currently logged on, and the system load averages for the past 1, 5, and 15 minutes.

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-f, --from
    Toggle printing the from (remote hostname) field. The default as released is for the from field to not be printed, although your system administrator or distribution maintainer may have compiled a version in which the from field is shown by default.

--help Display help text and exit.
-----Info: (*manpages*)w, 74 lines --Top-----
```

Find позволяет найти файл в файловой системе.

```
maria@maria-VirtualBox:/$ find -depth -name Nanoback.txt
find: './opt/containerd': Permission denied
find: './media/sf_ShareV': Permission denied
find: './tmp/systemd-private-7e58fd3fdf324a2b860b9714f1f69ba4-ModemManager.service-079r1Y': Permission denied
find: './tmp/systemd-private-7e58fd3fdf324a2b860b9714f1f69ba4-bolt.service-P4lJhf': Permission denied
```

```
find: './proc/21638/ns': Permission denied
find: './home/maria/.kube': Permission denied
./home/maria/Nanoback.txt
find: './etc/cups/ssl': Permission denied
find: './etc/ssl/private': Permission denied
```

Locate является альтернативой ему, но он бывает проще в настройке и позволяет найти файл быстрее (работает с базой данных файлов):

```
maria@maria-VirtualBox:/home$ locate Nanoback.txt
/home/maria/Nanoback.txt
```

Whereis удобен при поиске мануалов, исходников и бинарных файлов

```
maria@maria-VirtualBox:/home$ whereis -m man
man: /usr/share/man/man1/man.1.gz /usr/share/man/man7/man.7.gz
maria@maria-VirtualBox:/home$ whereis ls
ls: /bin/ls /usr/share/man/man1/ls.1.gz
```


Less и zless позволяют читать текстовые файлы:

```
maria@maria-VirtualBox:/usr/share/doc$ less nano/*  
maria@maria-VirtualBox:/usr/share/doc$
```

```
This file lists people who have made significant contributions to the  
nano editor. Please see the ChangeLog for specific changes by author.  
-----
```

```
Chris Allegretta <chrisa@asty.org>
```

```
  * Original program author and long-time maintainer.
```

```
David Lawrence Ramsey <pooka109@gmail.com>
```

```
  * Former stable series maintainer. Multiple buffer support,  
    operating dir (-o) option, bug fixes for display routines,  
    wrapping code, spelling fixes, constantshow mode, parts of  
    UTF-8 support, softwrap overhaul, and various other fixes.
```

```
Jordi Mallach <jordi@gnu.org>
```

```
  * Debian package maintainer, fellow bug squasher.
```

```
  * Internationalization support head, ca.po maintainer.
```

```
Adam Rogoyski <rogoyski@cs.utexas.edu>
```

```
  * New write_file() function, read_file() optimization, mouse  
    support, resize support, nohelp (-x) option, justify function,  
    follow symlink option and bugfixes, and much more.
```

```
Robert Siemborski <rjs3@andrew.cmu.edu>
```

```
  * Miscellaneous cut, display, replace, and other bug fixes,  
    original and new "magic line" code, read_line() function,  
    new edit display routines.
```

```
Rocco Corsi <rocco.corsi@sympatico.ca>
```

```
  * Internal spelling code, many optimizations and bug fixes for  
    findnextstr() and search-related functions, various display  
    and file handling fixes.
```

```
David Benbennick <dbenbenn@math.cornell.edu>
```

```
  * Wrap and justify bugfixes/enhancements, new color syntax  
    code, memleak fixes, parts of the UTF-8 support, and other  
    miscellaneous fixes.
```

```
Mike Frysinger <vapier@gentoo.org>
```

```
  * Gentoo package maintainer. Whitespace display mode,  
    --enable-utf8/--disable-utf8 configure options for ncurses,  
    many new color regexes and improvements to existing color  
    regexes in syntax/*.nanorc, the move from svn to git, the  
    conversion to gnu lib, and miscellaneous bug fixes.
```

```
Mark Majeres <mark@engine12.com>
```

```
  * A functional undo/redo system, and coloring nano's interface.
```

```
Mahyar Abbaspour <mahyar.abaspour@gmail.com>
```

```
:
```