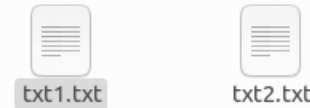


آز سیستم عامل
تمرین شماره ۲ - گروه ۱۴
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تصویر ۱:

دستور **diff** برابر مقایسه محتوای دو دایرکتوری یا دو فایل به کار میرود. خروجی به ما نشان میدهد که در کدام سطر فایل ها تفاوت وجود دارد و اگر تفاوت نداشته باشند خروجی نشان داده نمیشود. این تفاوت میتواند با سه کارکتر a, c, d نمایش داده شود.

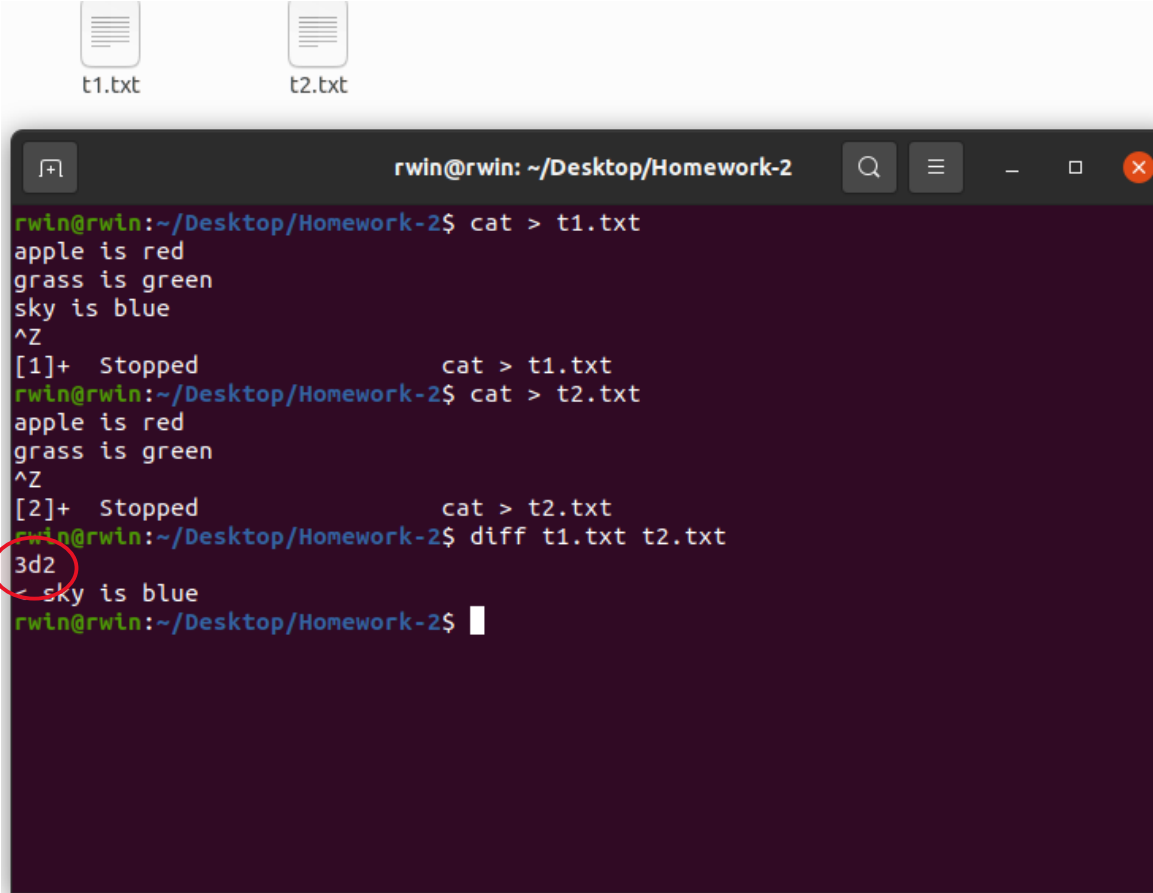
C: change



```
rwini@rwini: ~/Desktop/Homework-2
rwini@rwini:~/Desktop/Homework-2$ cat > txt1.txt
apple is red
grass is green
sky is blue
^Z
[1]+  Stopped                  cat > txt1.txt
rwini@rwini:~/Desktop/Homework-2$ cat > txt2.txt
apple is red
grass is green
sky is grey
^Z
[2]+  Stopped                  cat > txt2.txt
rwini@rwini:~/Desktop/Homework-2$ diff txt1.txt txt2.txt
txt1.txt txt2.txt
3c3
< sky is blue
---
> sky is grey
rwini@rwini:~/Desktop/Homework-2$
```

اگر تفاوت در حذف شدن یک سطر باشد با کاراکتر d نمایش داده میشود.

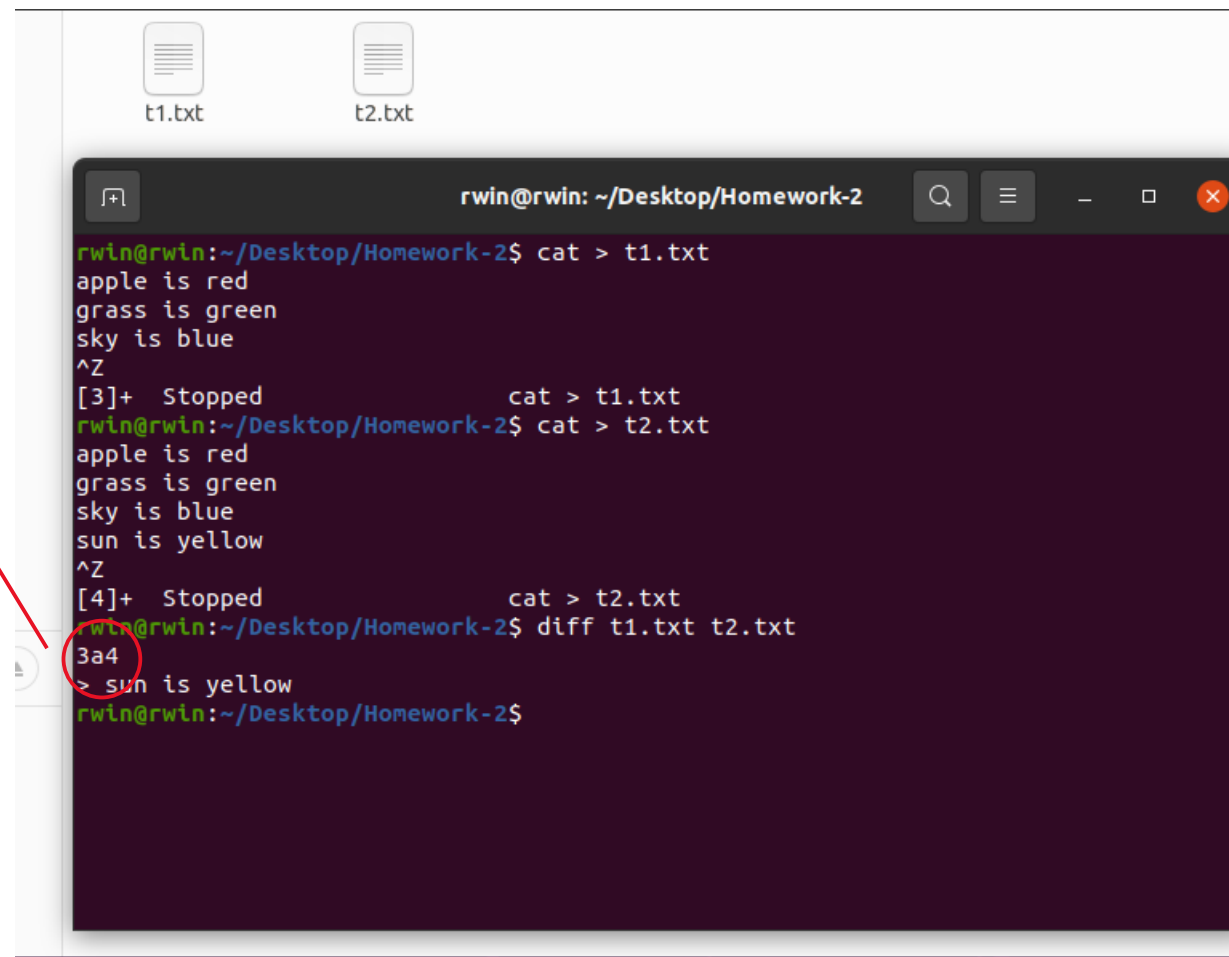
d: deleted

A terminal window titled 'rwin@rwin: ~/Desktop/Homework-2' showing the execution of 'cat' and 'diff' commands. The 'diff' command output shows a deletion in t2.txt. A red circle highlights the '3d2' output, and a red arrow points from the text 'd: deleted' to it. Above the terminal, icons for 't1.txt' and 't2.txt' are visible.

```
rwin@rwin:~/Desktop/Homework-2$ cat > t1.txt
apple is red
grass is green
sky is blue
^Z
[1]+  Stopped                  cat > t1.txt
rwin@rwin:~/Desktop/Homework-2$ cat > t2.txt
apple is red
grass is green
^Z
[2]+  Stopped                  cat > t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff t1.txt t2.txt
3d2
< sky is blue
rwin@rwin:~/Desktop/Homework-2$
```

اگر تفاوت در اضافه شدن یک سطر باشد با کاراکتر a نمایش داده میشود.

a: added



The screenshot shows a terminal window titled 'rwin@rwin: ~/Desktop/Homework-2'. It contains the following commands and output:

```
rwin@rwin:~/Desktop/Homework-2$ cat > t1.txt
apple is red
grass is green
sky is blue
^Z
[3]+  Stopped                  cat > t1.txt
rwin@rwin:~/Desktop/Homework-2$ cat > t2.txt
apple is red
grass is green
sky is blue
sun is yellow
^Z
[4]+  Stopped                  cat > t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff t1.txt t2.txt
3a4
> sun is yellow
rwin@rwin:~/Desktop/Homework-2$
```

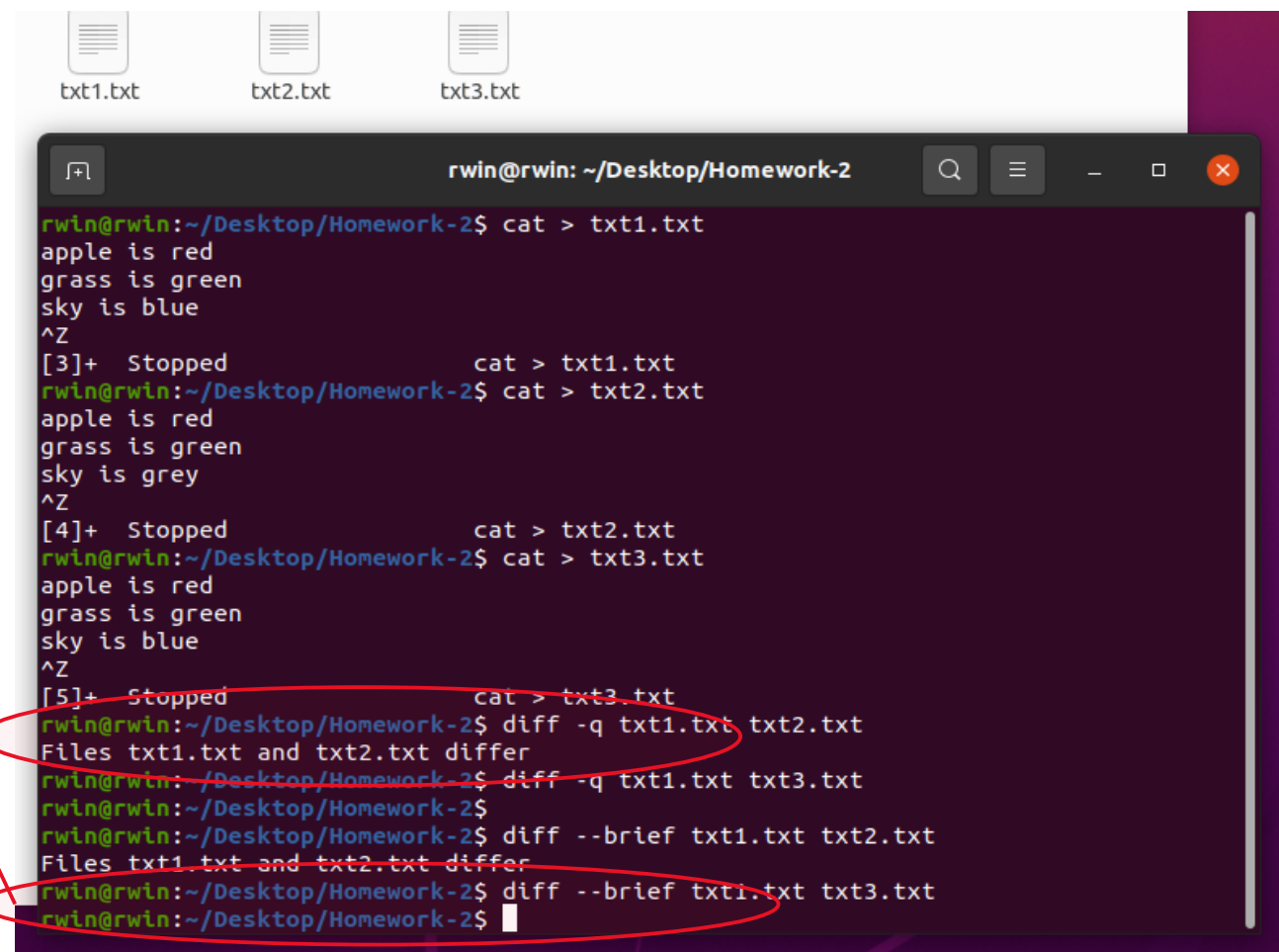
A red circle highlights the '3a4' output of the diff command, and a red arrow points from the text 'a: added' to it.

آپشن **--normal** همان پاسخ معمولی را باز میگرداند و میتواند از آنج استفاده نکرد.

```
rwini@rwini:~/Desktop/Homework-2$ diff --normal txt1.txt txt2.txt
3c3
< sky is blue
...
> sky is grey
rwini@rwini:~/Desktop/Homework-2$
```

--brief, -q - پاسخ کوتاه‌تر تنها هنگامی که دو فایل با یکدیگر تفاوت داشته باشد می‌دهد.

دو فایل تفاوت ندارند



The screenshot shows a terminal window titled 'rwin@rwin: ~/Desktop/Homework-2'. At the top, three file icons labeled 'txt1.txt', 'txt2.txt', and 'txt3.txt' are visible. The terminal content is as follows:

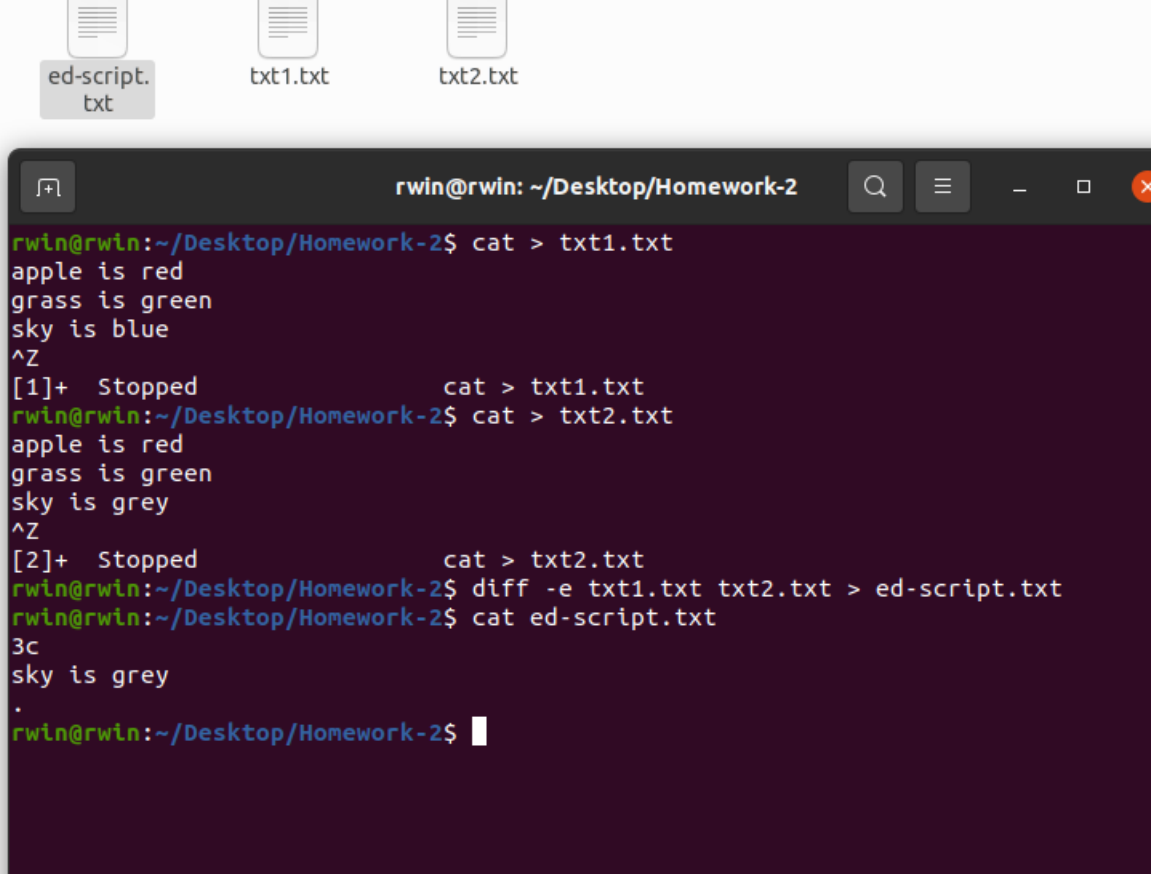
```
rwin@rwin:~/Desktop/Homework-2$ cat > txt1.txt
apple is red
grass is green
sky is blue
^Z
[3]+  Stopped                  cat > txt1.txt
rwin@rwin:~/Desktop/Homework-2$ cat > txt2.txt
apple is red
grass is green
sky is grey
^Z
[4]+  Stopped                  cat > txt2.txt
rwin@rwin:~/Desktop/Homework-2$ cat > txt3.txt
apple is red
grass is green
sky is blue
^Z
[5]+  Stopped                  cat > txt3.txt
rwin@rwin:~/Desktop/Homework-2$ diff -q txt1.txt txt2.txt
Files txt1.txt and txt2.txt differ
rwin@rwin:~/Desktop/Homework-2$ diff -q txt1.txt txt3.txt
Files txt1.txt and txt3.txt differ
rwin@rwin:~/Desktop/Homework-2$ diff --brief txt1.txt txt2.txt
Files txt1.txt and txt2.txt differ
rwin@rwin:~/Desktop/Homework-2$ diff --brief txt1.txt txt3.txt
Files txt1.txt and txt3.txt differ
rwin@rwin:~/Desktop/Homework-2$
```

Red circles highlight the output of the 'diff' commands, and a red arrow points from the Persian text 'دو فایل تفاوت ندارند' to the first 'Files txt1.txt and txt2.txt differ' result.

--report-identical-files, -s - تنها هنگامی که دو فایل یکسان باشند پاسخ می‌دهد. در صورت یافتن تفاوت پاسخ عادی نمایش داده می‌شود.

```
rwil@rwil:~/Desktop/Homework-2$ cat > txt1.txt
apple is red
grass is green
sky is blue
^Z
[1]+  Stopped                  cat > txt1.txt
rwil@rwil:~/Desktop/Homework-2$ cat > txt2.txt
apple is red
grass is green
sky is grey
^Z
[2]+  Stopped                  cat > txt2.txt
rwil@rwil:~/Desktop/Homework-2$
rwil@rwil:~/Desktop/Homework-2$ cat > txt3.txt
apple is red
grass is green
sky is blue
^Z
[3]+  Stopped                  cat > txt3.txt
rwil@rwil:~/Desktop/Homework-2$
rwil@rwil:~/Desktop/Homework-2$ diff -s txt1.txt txt2.txt
Bc3
< sky is blue
---
> sky is grey
rwil@rwil:~/Desktop/Homework-2$ diff --report-identical-files txt1.txt txt2.txt
Bc3
< sky is blue
---
> sky is grey
rwil@rwil:~/Desktop/Homework-2$ diff -s txt1.txt txt3.txt
Files txt1.txt and txt3.txt are identical
rwil@rwil:~/Desktop/Homework-2$ diff --report-identical-files txt1.txt txt3.txt
Files txt1.txt and txt3.txt are identical
rwil@rwil:~/Desktop/Homework-2$
rwil@rwil:~/Desktop/Homework-2$
```

--ed, -e، تفاوت دو فایل را در فرمت ed script و متن قابل ویرایش باز میگردانند و با ذخیره کردن آن در یک فایل بتوان آن را ادیت کرد.



```
rwil@rwil: ~/Desktop/Homework-2
rwil@rwil:~/Desktop/Homework-2$ cat > txt1.txt
apple is red
grass is green
sky is blue
^Z
[1]+  Stopped                  cat > txt1.txt
rwil@rwil:~/Desktop/Homework-2$ cat > txt2.txt
apple is red
grass is green
sky is grey
^Z
[2]+  Stopped                  cat > txt2.txt
rwil@rwil:~/Desktop/Homework-2$ diff -e txt1.txt txt2.txt > ed-script.txt
rwil@rwil:~/Desktop/Homework-2$ cat ed-script.txt
3c
sky is grey
.
```


-c, --context خروجی در فرمت کانتکست نمایش داده میشود. این فرمت تفاوت دو فایل را در قالب توضیحات شامل نام فایل، شماره خطوط و تفاوت ها باز میگرداند. همچنین این فرمت برابر مشاهده و اعمال تفاوت ها در patch files میباشد.

```
rwini@rwini:~/Desktop/Homework-2$ cat > t1.txt
sky
green
apple
red
^Z
[5]+  Stopped                  cat > t1.txt
rwini@rwini:~/Desktop/Homework-2$ cat > t2.txt
sky
blue
apple
yellow
^Z
[6]+  Stopped                  cat > t2.txt
rwini@rwini:~/Desktop/Homework-2$ diff -c t1.txt t2.txt
*** t1.txt      2023-05-25 12:11:18.203095859 -0400
--- t2.txt      2023-05-25 12:11:42.835096893 -0400
*****
*** 1,4 ****
   sky
!  green
   apple
!  red
--- 1,4 ----
   sky
!  blue
   apple
!  yellow
```

--unified, -u مانند **-C** عمل میکند با این تفاوت که خروجی در فرمت **unified** میباشد که این فرمت نیز توضیحات شامل نام و شماره خطوط متفاوت و تفاوت ها میباشد و در **patch files** به کار میرود.

```
rwin@rwin: ~/Desktop/Homework-2
rwin@rwin:~/Desktop/Homework-2$ cat > t1.txt
red
blue
green
^Z
[1]+  Stopped                  cat > t1.txt
rwin@rwin:~/Desktop/Homework-2$
rwin@rwin:~/Desktop/Homework-2$ cat > t2.txt
red
yellow
green
^Z
[2]+  Stopped                  cat > t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff -u t1.txt t2.txt
--- t1.txt      2023-05-25 12:14:03.167102789 -0400
+++ t2.txt      2023-05-25 12:14:27.395103806 -0400
@@ -1,3 +1,3 @@
 red
-blue
+yellow
 green
rwin@rwin:~/Desktop/Homework-2$
```

(case-insensitive) -i مقایسه دو فایل را بدون در نظر گرفتن بزرگ یا کوچک حروف برر می‌کند و اگر دو فایل تنها در این مورد متفاوت باشند خروجی نمایش داده نمی‌شود.

```
rwin@rwin:~/Desktop/Homework-2$ cat > t1.txt
red
blue
yellow
^Z
[3]+  Stopped                  cat > t1.txt
rwin@rwin:~/Desktop/Homework-2$ cat > t2.txt
Red
Blue
Yellow
^Z
[4]+  Stopped                  cat > t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff -i t1.txt t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff t1.txt t2.txt
1,3c1,3
< red
< blue
< yellow
---
> Red
> Blue
> Yellow
rwin@rwin:~/Desktop/Homework-2$
```

--version, -v خروجی اطلاعات شامل ورژن دستور diff و لایسنس و نویسندگان و ... را
نمایش میدهد.

```
rwini@rwini:~/Desktop/Homework-2$ diff --version
diff (GNU diffutils)
Copyright (C) 2018 Free Software Foundation, Inc.
License: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Paul Eggert, Mike Haertel, David Hayes,
Richard Stallman, and Len Tower.
rwini@rwini:~/Desktop/Homework-2$
```

(ignore-space) -b مقایسه دو فایل را با چشم پوشی از فاصله‌ها و اضافه‌ها انجام می‌دهد و اگر تفاوت دیگری نداشته باشند خروجی نمایش داده نمی‌شود.

```
rwin@rwin:~/Desktop/Homework-2$ cat > t1.txt
red green blue yellow
^Z
[5]+  Stopped                  cat > t1.txt
rwin@rwin:~/Desktop/Homework-2$ cat > t2.txt
red green blue yellow
^Z
[6]+  Stopped                  cat > t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff -b t1.txt t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff t1.txt t2.txt
1c1
< red green blue yellow
---
> red green blue yellow
rwin@rwin:~/Desktop/Homework-2$
```

(ignore-blank-lines) -B مقایسه دو فایل را با نادیده گرفتن خطوط خالی انجام میدهد.

```
rwin@rwin: ~/Desktop/Homework-2
rwin@rwin:~/Desktop/Homework-2$ cat > t1.txt
red
green
^Z
[9]+  Stopped                  cat > t1.txt
rwin@rwin:~/Desktop/Homework-2$
rwin@rwin:~/Desktop/Homework-2$ cat > t2.txt
red

green
^Z
[10]+ Stopped                  cat > t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff -B t1.txt t2.txt
rwin@rwin:~/Desktop/Homework-2$ diff t1.txt t2.txt
1a2
>
rwin@rwin:~/Desktop/Homework-2$
```


--side by side, -y خروجی مقایسه دو فایل را در قالب دو ستون کنار هم نمایش می‌دهد. که هر ستون مربوط به یکی از فایل‌ها می‌باشد و بر اساس نشان دادن تفاوت از کاراکتر | کنار آخ استفاده می‌کند. اگر خط در فایل موجود نباشد از < یا > بر اساس خط که در آخ استفاده می‌کند.

```
rwini@rwini:~/Desktop/Homework-2$ cat > t1.txt
red
blue
green
^Z
[19]+  Stopped                  cat > t1.txt
rwini@rwini:~/Desktop/Homework-2$ cat > t2.txt
red
blue
yellow
^Z
[20]+  Stopped                  cat > t2.txt
rwini@rwini:~/Desktop/Homework-2$ diff -y t1.txt t2.txt
red                                     red
blue                                  blue
green                                | yellow
rwini@rwini:~/Desktop/Homework-2$
```

--text, -a مقایسه دو فایل را با این فرم که هر دو در فرمت تکست و ASCII میباشند انجام میدهد.

```
rwini@rwini:~/Desktop/Homework-2$ cat > t1.txt
hello
^Z
[7]+  Stopped                  cat > t1.txt
rwini@rwini:~/Desktop/Homework-2$ cat > t2.html
hello
^Z
[8]+  Stopped                  cat > t2.html
rwini@rwini:~/Desktop/Homework-2$ diff -a t1.txt t2.html
rwini@rwini:~/Desktop/Homework-2$ diff --text t1.txt t2.html
```

--help خلاصه اِستِعمالِ آپشن‌ها و سوییچ‌ها در دستور diff را در اختیار ما قرار می‌دهد.

```
rwln@rwln:~/Desktop/Homework-2$ diff --help
Usage: diff [OPTION]... FILES
Compare FILES line by line.

Mandatory arguments to long options are mandatory for short options too.
  -q, --brief                output a normal diff (the default)
                             report only when files differ
  -s, --report-identical-files report when two files are the same
  -c, -C NUM, --context[=NUM] output NUM (default 3) lines of copied context
  -u, -U NUM, --unified[=NUM] output NUM (default 3) lines of unified context
  -e, --ed                   output an ed script
  -n, --rcs                   output an RCS format diff
  -y, --side-by-side          output in two columns
  -W, --width=NUM             output at most NUM (default 130) print columns
  --left-column                output only the left column of common lines
  --suppress-common-lines      do not output common lines

  -p, --show-c-function        show which C function each change is in
  -F, --show-function-line=RE show the most recent line matching RE
  --label LABEL                use LABEL instead of file name and timestamp
                               (can be repeated)

  -t, --expand-tabs            expand tabs to spaces in output
  -T, --initial-tab            make tabs line up by prepending a tab
  --tabsize=NUM                tab stops every NUM (default 8) print columns
  --suppress-blank-empty       suppress space or tab before empty output lines
  -l, --paginate               pass output through 'pr' to paginate it

  -r, --recursive              recursively compare any subdirectories found
```