Lab 4 Submission
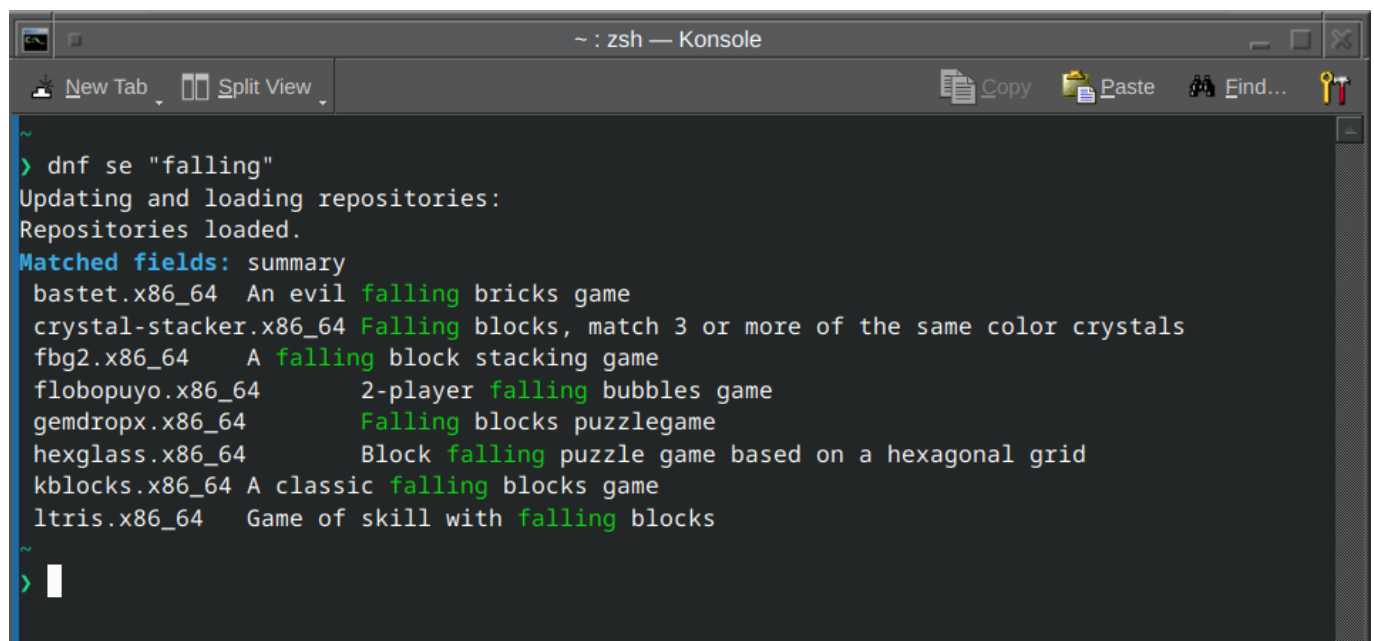
This lab was completed in Fedora Linux using DNF package manager instead of APT.

Using DNF

q1.1

Searched for 'falling' games as Tetris-specific packages are limited in Fedora repos. Results demonstrate DNF search functionality.

```
                          ~ : zsh — Konsole                                    _ □ X
  New Tab    Split View                        Copy    Paste    Find...

⟩ dnf se "falling"
Updating and loading repositories:
Repositories loaded.
Matched fields: summary
 bastet.x86_64  An evil falling bricks game
 crystal-stacker.x86_64 Falling blocks, match 3 or more of the same color crystals
 fbg2.x86_64    A falling block stacking game
 flobopuyo.x86_64        2-player falling bubbles game
 gemdropx.x86_64         Falling blocks puzzlegame
 hexglass.x86_64         Block falling puzzle game based on a hexagonal grid
 kblocks.x86_64 A classic falling blocks game
 ltris.x86_64   Game of skill with falling blocks
~
⟩ █
```

q1.2

```
~ : zsh — Konsole
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~
> sudo dnf remove bastet && sudo dnf install ltris kblocks
Package                        Arch     Version              Repository          Size
Removing:
 bastet                        x86_64   0.43.2-11.fc42       fedora           231.8 KiB

Transaction Summary:
 Removing:           1 package

After this operation, 232 KiB will be freed (install 0 B, remove 232 KiB).
Is this ok [y/N]: y
Running transaction
[1/2] Prepare transaction                              100% |   3.0   B/s |   1.0   B | 00m00s
[2/2] Removing bastet-0:0.43.2-11.fc42.x86_64          100% |  31.0   B/s |  13.0   B | 00m00s
Complete!
Updating and loading repositories:
Repositories loaded.
Package                        Arch     Version              Repository          Size
Installing:
 kblocks                       x86_64   25.08.2-1.fc42       updates           2.8 MiB
 ltris                         x86_64   1.3.2-2.fc42         rpmfusion-free    5.2 MiB
Installing dependencies:
 SDL_mixer                     x86_64   1.2.12-34.fc42       fedora          203.4 KiB
 libmikmod                     x86_64   3.3.13-1.fc42        updates         400.8 KiB

Transaction Summary:
 Installing:         4 packages

Total size of inbound packages is 4 MiB. Need to download 4 MiB.
After this operation, 9 MiB extra will be used (install 9 MiB, remove 0 B).
Is this ok [y/N]: y
[1/4] SDL_mixer-0:1.2.12-34.fc42.x86_64                100% | 211.7 KiB/s |  85.3 KiB | 00m00s
[2/4] libmikmod-0:3.3.13-1.fc42.x86_64                 100% | 160.9 KiB/s | 166.8 KiB | 00m01s
[3/4] kblocks-0:25.08.2-1.fc42.x86_64                  100% |   1.5 MiB/s |   2.3 MiB | 00m02s
[4/4] ltris-0:1.3.2-2.fc42.x86_64                      100% | 791.6 KiB/s |   1.2 MiB | 00m02s
-----------------------------------------------------------------------------------------
[4/4] Total                                            100% |   1.8 MiB/s |   3.7 MiB | 00m02s
Running transaction
[1/6] Verify package files                             100% | 333.0   B/s |   4.0   B | 00m00s
[2/6] Prepare transaction                              100% |   9.0   B/s |   4.0   B | 00m00s
[3/6] Installing libmikmod-0:3.3.13-1.fc42.x86_64      100% |  49.2 MiB/s | 402.8 KiB | 00m00s
[4/6] Installing SDL_mixer-0:1.2.12-34.fc42.x86_64     100% |  14.4 MiB/s | 205.8 KiB | 00m00s
```

Used ltris and kblocks as available block-game alternatives to demonstrate install/remove operations, since tetris was not found in any matched fields.

q1.3

```
~ : zsh — Konsole

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~
) sudo dnf remove ltris
Package                      Arch    Version                  Repository              Size
Removing:
 ltris                       x86_64  1.3.2-2.fc42             rpmfusion-free         5.2 MiB
Removing unused dependencies:
 SDL_mixer                   x86_64  1.2.12-34.fc42           fedora               203.4 KiB
 libmikmod                   x86_64  3.3.13-1.fc42            updates              400.8 KiB

Transaction Summary:
 Removing:            3 packages

After this operation, 6 MiB will be freed (install 0 B, remove 6 MiB).
Is this ok [y/N]: y
Running transaction
[1/4] Prepare transaction                          100% |   9.0   B/s |   3.0   B |  00m00s
[2/4] Removing ltris-0:1.3.2-2.fc42.x86_64         100% |   1.8 KiB/s |  47.0   B |  00m00s
[3/4] Removing SDL_mixer-0:1.2.12-34.fc42.x86_64   100% |   1.2 KiB/s |  16.0   B |  00m00s
[4/4] Removing libmikmod-0:3.3.13-1.fc42.x86_64    100% |  33.0   B/s |  13.0   B |  00m00s
Complete!
~ took 4s
```

q1.4

```
~ : zsh — Konsole

New Tab    Split View                                              Copy    Paste    Find...

~
) sudo dnf clean all && sudo dnf autoremove
Removed 68 files, 48 directories (total of 98 MiB). 0 errors occurred.
Package                      Arch    Version                  Repository              Size
Removing:
 intel-media-driver          x86_64 25.2.6-1.fc42            rpmfusion-nonfree-upd  37.4 MiB
 libfreeaptx                 x86_64 0.2.2-1.fc42             rpmfusion-free         53.2 KiB
 libva-intel-driver          x86_64 2.4.1^20241027gitd30e013-1 rpmfusion-free       7.9 MiB
 pipewire-codec-aptx         x86_64 1.4.8-1.fc42            rpmfusion-free-update  45.1 KiB

Transaction Summary:
 Removing:            4 packages

After this operation, 45 MiB will be freed (install 0 B, remove 45 MiB).
Is this ok [y/N]: y
Running transaction
[1/5] Prepare transaction                          100% |  12.0   B/s |   4.0   B |  00m00s
[2/5] Removing pipewire-codec-aptx-0:1.4.8-1.fc42.x 100% | 750.0   B/s |   6.0   B |  00m00s
[3/5] Removing libfreeaptx-0:0.2.2-1.fc42.x86_64   100% |   3.4 KiB/s |   7.0   B |  00m00s
[4/5] Removing libva-intel-driver-0:2.4.1^20241027g 100% |   2.1 KiB/s |  11.0   B |  00m00s
[5/5] Removing intel-media-driver-0:25.2.6-1.fc42.x 100% |  25.0   B/s |   9.0   B |  00m00s
Complete!
~ took 16s
)
```
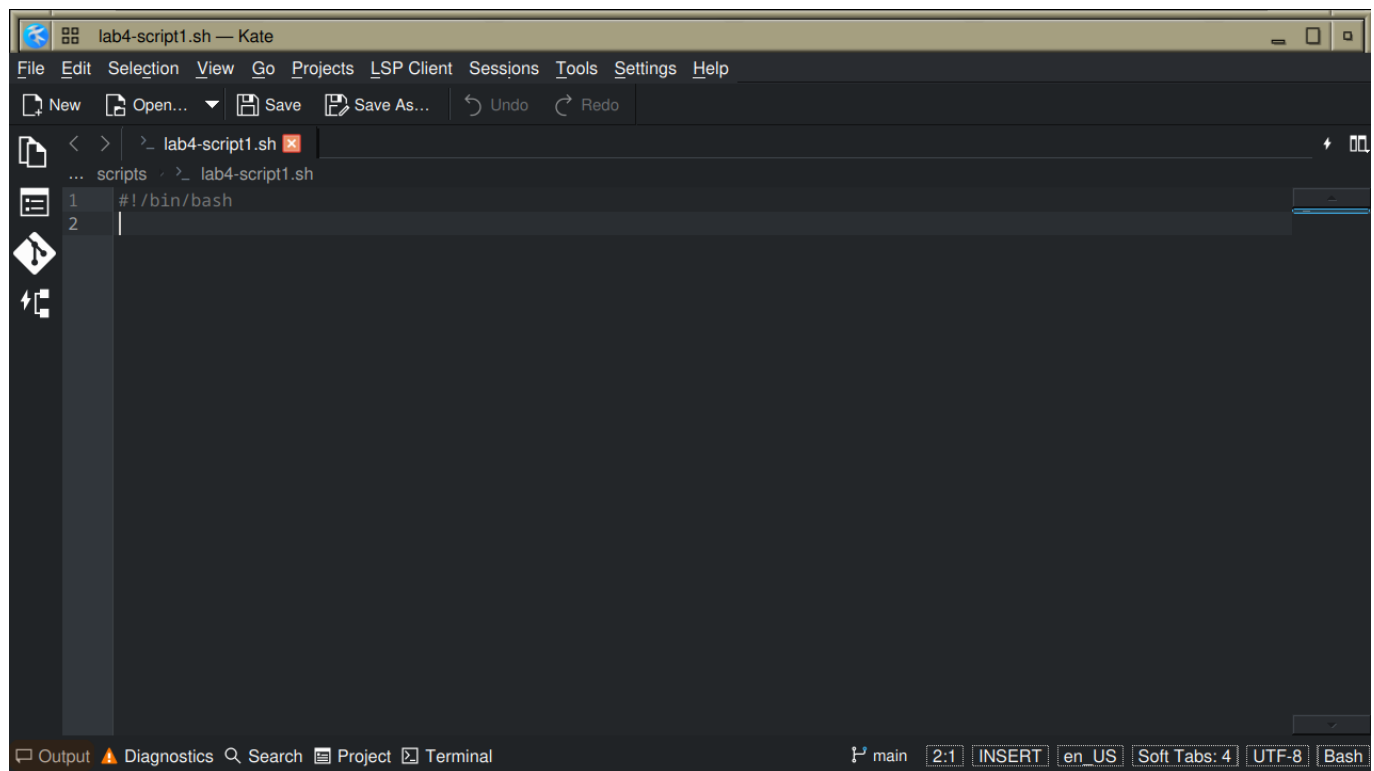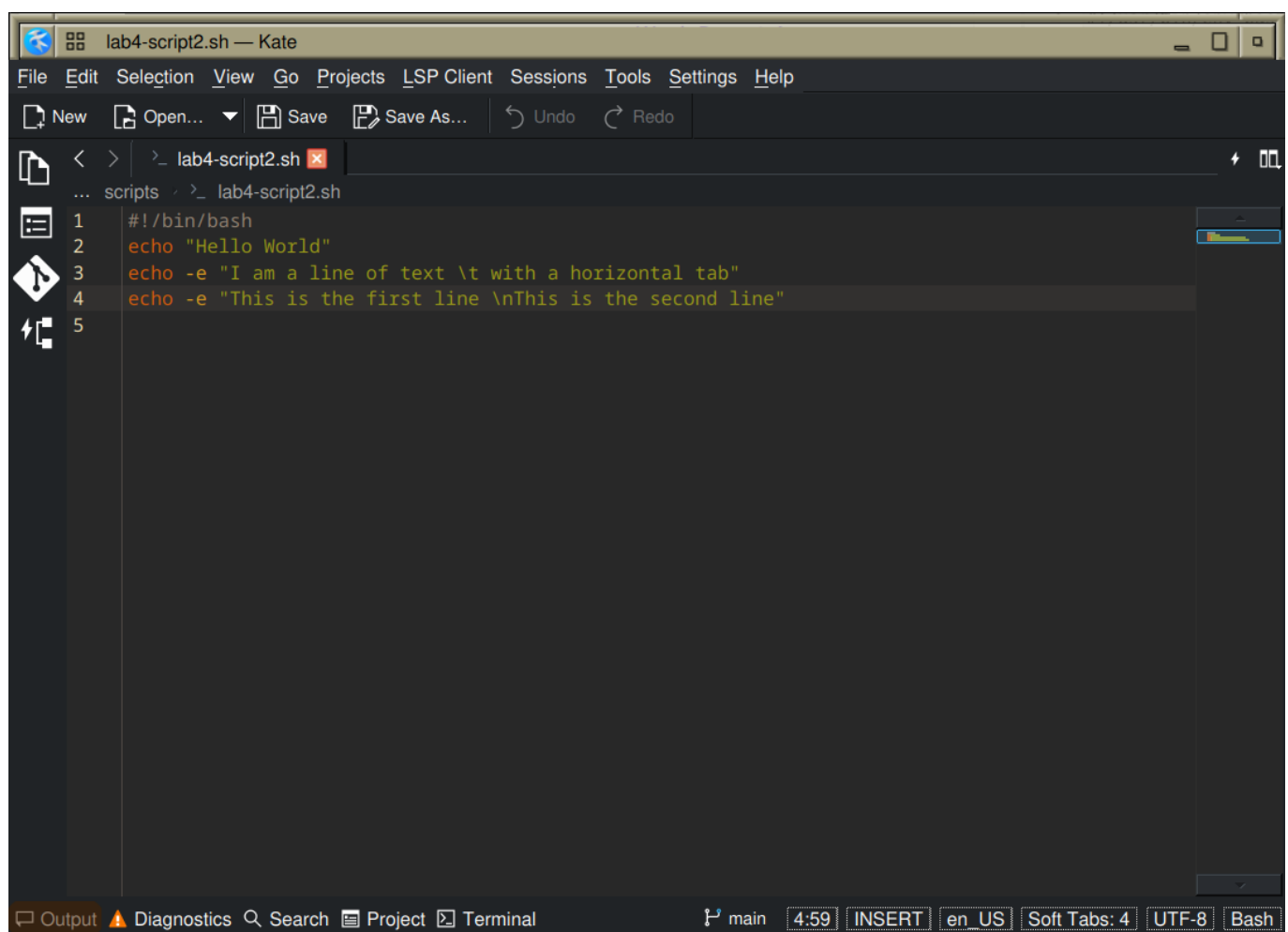
dnf does not ship with autoclean and autopurge
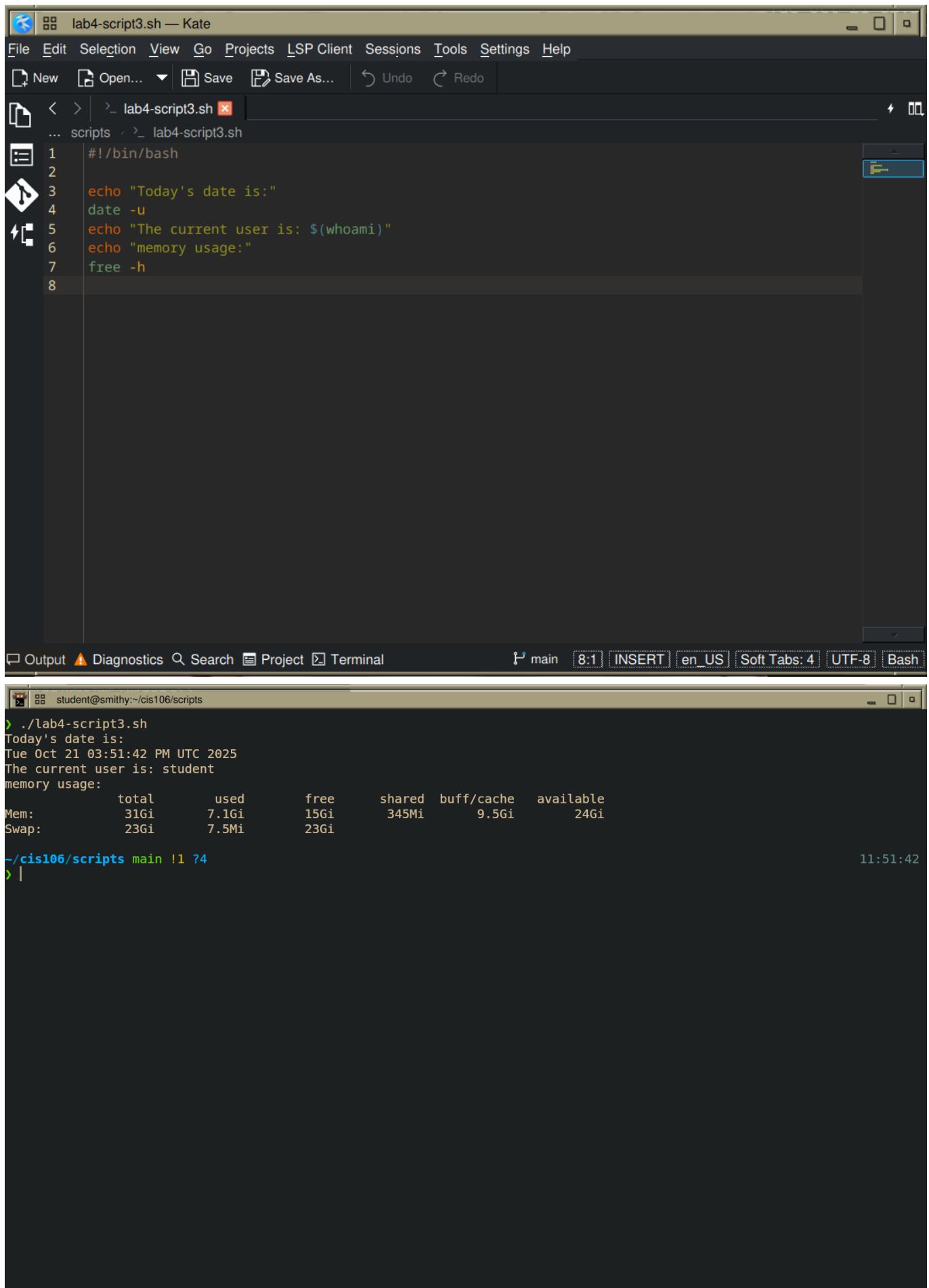
dnf clean all cleans the cache.

q2.1

q2.2

q2.3

```
lab4-script3.sh — Kate
File  Edit  Selection  View  Go  Projects  LSP Client  Sessions  Tools  Settings  Help

  New     Open...  ▼     Save    Save As...    Undo    Redo

     <   >    lab4-script3.sh ✕
  ... scripts  › lab4-script3.sh
  1    #!/bin/bash
  2
  3    echo "Today's date is:"
  4    date -u
  5    echo "The current user is: $(whoami)"
  6    echo "memory usage:"
  7    free -h
  8

  Output  ⚠ Diagnostics  🔍 Search  📰 Project  Terminal        main    8:1   INSERT   en_US   Soft Tabs: 4   UTF-8   Bash
```
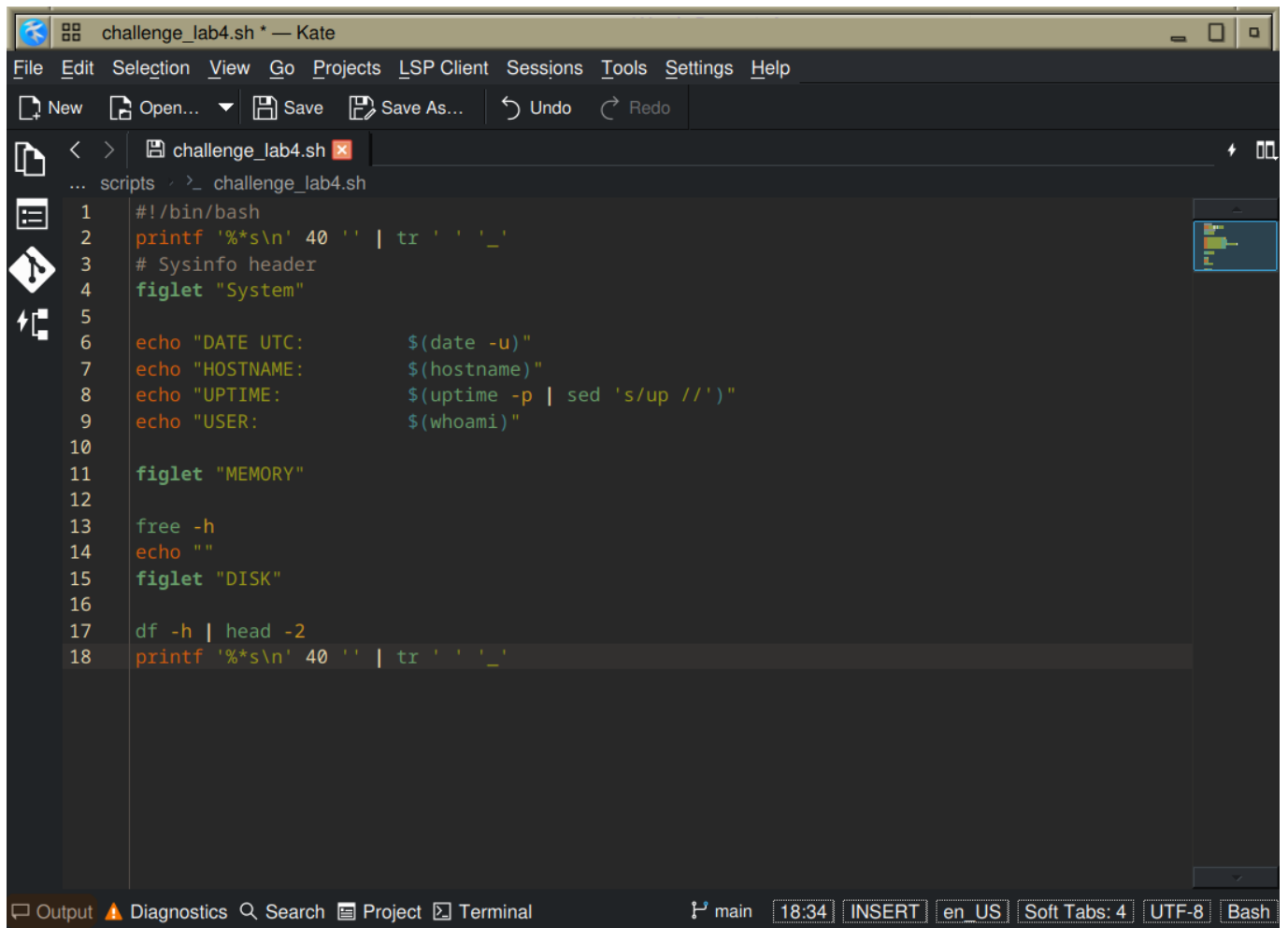
```
student@smithy:~/cis106/scripts
❭ ./lab4-script3.sh
Today's date is:
Tue Oct 21 03:51:42 PM UTC 2025
The current user is: student
memory usage:
              total        used        free      shared  buff/cache   available
Mem:           31Gi       7.1Gi        15Gi       345Mi       9.5Gi        24Gi
Swap:          23Gi       7.5Mi        23Gi

~/cis106/scripts main !1 ?4                                                          11:51:42
❭
```

Challenge Question

challenge_lab4.sh * — Kate

File   Edit   Selection   View   Go   Projects   LSP Client   Sessions   Tools   Settings   Help

New   Open... ▼   Save   Save As...   Undo   Redo
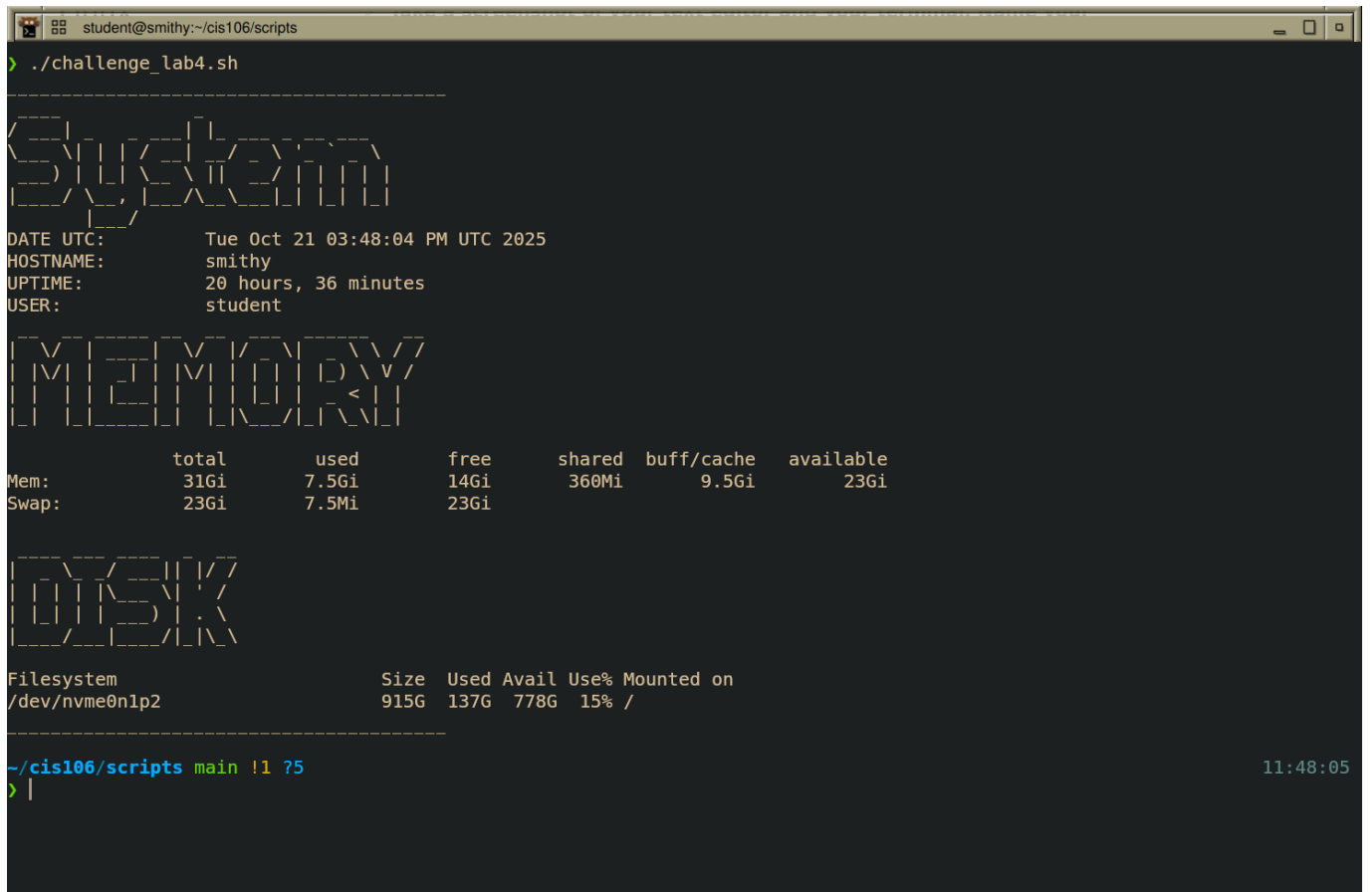
< >   challenge_lab4.sh ✕

... scripts ›_ challenge_lab4.sh

```bash
1    #!/bin/bash
2    printf '%*s\n' 40 '' | tr ' ' '_'
3    # Sysinfo header
4    figlet "System"
5
6    echo "DATE UTC:        $(date -u)"
7    echo "HOSTNAME:        $(hostname)"
8    echo "UPTIME:          $(uptime -p | sed 's/up //')"
9    echo "USER:            $(whoami)"
10
11   figlet "MEMORY"
12
13   free -h
14   echo ""
15   figlet "DISK"
16
17   df -h | head -2
18   printf '%*s\n' 40 '' | tr ' ' '_'
```

Output   ⚠ Diagnostics   Q Search   Project   Terminal   ┢ main   18:34   INSERT   en_US   Soft Tabs: 4   UTF-8   Bash

student@smithy:~/cis106/scripts

```
> ./challenge_lab4.sh
_____

 ____            _
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\___ \| | | / __| __/ _ \ '_ ` _ \
 ___) | |_| \__ \ ||  __/ | | | | |
|____/ \__, |___/\__\___|_| |_| |_|
       |___/
DATE UTC:      Tue Oct 21 03:48:04 PM UTC 2025
HOSTNAME:      smithy
UPTIME:        20 hours, 36 minutes
USER:          student

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|_|  |_|_____|_|  |_|\___/|_| \_\|_|

          total      used      free    shared  buff/cache   available
Mem:        31Gi     7.5Gi      14Gi     360Mi       9.5Gi        23Gi
Swap:       23Gi     7.5Mi      23Gi

 ____ ___ ____  _  __
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Filesystem              Size  Used Avail Use% Mounted on
/dev/nvme0n1p2          915G  137G  778G  15% /
_____

~/cis106/scripts main !1 ?5                                              11:48:05
> |
```