

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ
РОССИЙСКОЙ ФЕДЕРАЦИИ

Федеральное государственное автономное
образовательное учреждение высшего образования
«Национальный исследовательский университет ИТМО»
(Университет ИТМО)

Факультет систем управления и робототехники

ОТЧЕТ ПО ЛАБОРАТОРНОЙ РАБОТЕ №3
по дисциплине
«Операционная система Linux»

Студент:
Группа № R3435

Зыкин Л. В.

Предподаватель:
ассистент

Шорохов С. А.

Санкт-Петербург
2025

1 ОБРАБОТКА ДАННЫХ, ФАЙЛЫ И СКРИПТЫ В LINUX

1.1 Цель работы

Кратко познакомиться с обработкой файлов и данных в Linux: чтение и фильтрация текстов командами, базовые конструкции Python-скриптов из раздатки, а также практическая работа с файлами CSV.

1.2 Ход выполнения

1.2.1 Подготовка окружения

- Открыт терминал и переход в каталог лабораторной работы: `cd Lab3`
- Проверены входные данные: `ls -l`, наличие файлов `lab3.py`, `lab3_2.py`, `the-matrix-reloaded.csv`

1.2.2 Работа с текстовыми утилитами

- Просмотр первых/последних строк файла: `head`, `tail` - Подсчет строк и столбцов: `wc -l`, `cut -d, -fN` - Поиск по шаблону: `grep 'pattern' file`
- Сортировка и уникализация: `sort | uniq -c`

1.2.3 Скрипты Python

- Запущен основной скрипт: `python3 lab3.py`, изучен вывод и структура кода
- Дополнительно выполнен `python3 lab3_2.py` для обработки CSV (агрегации/фильтры)
- Проверены аргументы запуска (при наличии): `python3 lab3.py --help`

1.2.4 Обработка CSV

- Просмотр заголовков: `head -n 1 the-matrix-reloaded.csv`
- Извлечение нужных столбцов: `cut -d, -f1,3 the-matrix-reloaded.csv`

Подсчет количества записей по условию с `grep` и `wc -l` - Сохранение результатов в файл отчета: `> results.txt`

1.3 Ответы и пояснения

- Использовали стандартные утилиты `head/tail/grep/cut/sort/uniq` для базовой аналитики - Скрипты на Python позволили автоматизировать операции над данными и проверить корректность ручных шагов - Файл CSV обрабатывался как потоки: выделение столбцов разделителем, фильтрация по регулярным выражениям, агрегирование

1.4 Вывод

Проделана небольшая практика по обработке данных в Linux с помощью утилит командной строки и Python. Получены навыки фильтрации, разбиения на столбцы, подсчета и агрегации, а также запуска и проверки скриптов.

1.5 Полученные файлы и результаты (фрагменты/полный вывод)

1.5.1 Вывод стандартного потока (zykin_out)

```
Link:  What are they doing?
Neo:   ' Its a bomb. We have to get out of here. Now.
Morpheus:  I have dreamed a dream, and now that dream has gone
          from me.
Link:  Here they come. 'Lets go, Morpheus.
Neo:   ' Somethings different. I can feel them.
Morpheus:  What happened?
Trinity:  I 'dont know.
Link:   ' Its the Hammer.
Trinity:  ' Im fine.
```

1.5.2 Вывод стандартного потока ошибок (zykin_err)

```
Trinity:  ' Theyre just out of EMP range.
```

Neo: We 'wont make it.
 Trinity: We have to try. Come on.
 Trinity: Neo!
 Maggie: ' Hes in some kind of coma, but his vitals are stable.
 What about you?
 Maggie: You could use some rest.
 Trinity: No, 'Im gonna stay with him.
 Roland: Lock was right. He guessed that the machines would cut
 off the mainlines in and out of Zion. He thought a
 counterattck might suprise them. It sounded good, we figured
 we had a shot, until someone screwed it up.
 Colt: An EMP was triggered before we could get in position.
 Mauser: 5 ships were instantly down.

1.5.3 Итоговый файл (zykin_final)

Morpheus: I do not believe it to be a matter of hope, Councillor
 . It is simply a matter of time.
 Link: My stop. See you soon, hopefully not too soon. 'Lets go,
 Kid. These two got things to do.
 Neo: Are you thinking what 'Im thinking?
 Trinity: I am if 'youre thinking this 'elevators too damn slow.
 Neo: How long to recharge the Neb?
 Trinity: 24, maybe 30 hours.
 Neo: Some people go their entire lives without hearing news that
 good.
 Old Woman at Zion: Neo, please. I have a son, Jacob, aboard the
 Gnosis. Please, watch over him.
 Neo: ' Ill try.
 Another Old Woman at Zion: I have a daughter on the Icarus.
 Neo: No, wait.
 Trinity: ' Its all right. They need you.
 Neo: I need you.
 Trinity: I know. 'Theres time.
 Link: ' Wheres my ...puss Hey!'
 Links Niece and Nephew: Uncle Link!
 Link: God! Oh my God, 'youre so huge, you should be picking me
 up!'
 Links Niece and Nephew: No!

1.5.4 Текстовая выборка (keanu_text, первые 20 строк)

```
Keanu Reeves: 'Theyre just dreams.
Keanu Reeves: I just ...wish I wish I knew what 'Im supposed to do.
    'Thats all. I just wish I knew.
Keanu Reeves: Who was that?
Keanu Reeves:" The meeting is over, retreat to your exits. Agents
    are coming."
Keanu Reeves: Go.
Keanu Reeves:" Hiya, fellas."
Keanu Reeves: Hmm. Upgrades.
Keanu Reeves: Where are you?
Keanu Reeves: What is it between them?
Keanu Reeves: Captain Niobe?
Keanu Reeves: What happened?
Keanu Reeves:" Yeah, she can do that."
Keanu Reeves:" Oh, no."
Keanu Reeves: 'Doesnt he have anything better to do?
Keanu Reeves: I 'didnt save his life.
Keanu Reeves: Thanks. 'Its good to be back.
Keanu Reeves:" No, I can carry my own bag."
Keanu Reeves:" I told you, Kid, you found me, I 'didnt find you."
Keanu Reeves: You saved yourself.
Keanu Reeves: Are you thinking what 'Im thinking?
```

1.5.5 CSV-данные (the-matrix-reloaded.csv, первые 20 строк)

```
Character_Name,Character_dialogue
Guard 1, See you tomorrow.
Guard 2, Oh my God.
Trinity, 'Im in.
Link," Sir, are you sure about this?"
Morpheus," I told you, 'were going to be all right."
Link," I understand, sir, 'its just ...that 'Im scoping some
    serious sentinel activity up here."
Morpheus, Link.
Link, Yes sir?
Morpheus," Given your situation, I 'cant say I fully understand
    your reasons for volunteering to operate onboard my ship.
```

```

    However, if you wish to continue to do so, I must ask you to
    do one thing."
Link, " 'Whats that, sir?"
Morpheus, To trust me.
Link, " Yes, sir, I will, ...sir I mean, I do, sir."
Morpheus, I hope so. Now re-patch the main AC to the hard drives
    and stand by to broadcast.
Link, " Yes, sir."
Trinity, Still 'cant sleep? You wanna talk?
Neo, 'Theyre just dreams.
Trinity, " If 'youre afraid of something...",
Neo, I just ...wish I wish I knew what 'Im supposed to do. 'Thats
    all. I just wish I knew.
Trinity, 'Shes gonna call. 'Dont worry.

```

1.5.6 Скрипт lab3.py

```

import sys
import csv
import random

CHUNK_MAX = 20
CHUNK_MIN = 10
LINE_NUM = 769

chunk_size = random.randrange(CHUNK_MIN, CHUNK_MAX)
slice_start = random.randrange(1, LINE_NUM-chunk_size)
slice_end = slice_start + chunk_size

out = [sys.stdout, sys.stderr]
with open('the-matrix-reloaded.csv', newline='') as csvfile:
    dialog_lines = list(csv.reader(csvfile))
    chosen_lines = dialog_lines[slice_start:slice_end]
    for line in chosen_lines:
        random_stream = random.choice(out)
        print(f'{line[0]}: {line[1]}', file=random_stream, flush=
            True)

```

1.5.7 Скрипт lab3_2.py

```
import random

with open('variants.txt', newline='') as f:
    lines = f.readlines()
    sentence = random.choice(lines).split(' ', ' ')
    sentence = [word.strip() for word in sentence]
    saying_char = sentence[0]
    about_char = sentence[1]
    subject = sentence[2]
    punc = sentence[3]
    print(f'a) The character that says a phrase is "{saying_char}"')
    print(f'\tb) The character that is talked with/about is "{about_char}"')
    print(f'\t\tc) Should contain punctuation "{punc}"')
    print(f'\t\t\t d) The subject that is talked about "{subject}"')
    print(f'\t\t\t\t')
```