Assignment 3

1. **Identify and fix all the errors** in the JSON data from a student management system - 3 Marks

```
json
{
  "students": [
    {
      "id": 101,
      "name": "Sarah Johnson",
      "courses": ["CS101", "MATH200", "ENG150"],
      "gpa": 3.85,
      "active": true,
      "graduation_date": null
    },
    {
      "id": 102
      "name": "Alex Chen",
      "courses": ["CS101" "CS102", "STAT101"],
      "gpa": 3.92,
      "active": True,
      "advisor": undefined,
      "notes": "Excellent student with strong analytical
skills"
    }
    {
      "id": "103",
      "name": "Maria Rodriguez",
      "courses": [],
      "gpa": 3.67,
      "active": false,
      "special_programs": ["honors", "research"],
    }
  ],
  "last_updated": "2024-09-15T10:30:00Z"
  "total_students": 3
}
```

2. Your web application currently uses this TOML configuration file. - 5 Marks

[server]
host = "0.0.0.0"
port = 8080
debug = false

```
max_connections = 1000

[database]
url = "postgresql://localhost:5432/myapp"
pool_size = 20
timeout = 30

[logging]
level = "info"
file = "/var/log/myapp.log"
max_size = "100MB"
rotate = true

[[feature_flags]]
name = "new_ui"
enabled = true
rollout_percentage = 25

[[feature_flags]]
name = "analytics"
enabled = false
rollout_percentage = 0

[cache]
redis_url = "redis://localhost:6379/0"
ttl = 3600
```

Analyze the configuration and answer the following questions:

a. How many feature flags are currently defined, and which ones are active?
b. What happens when the log file reaches 100MB?
c. If you wanted to make the server accessible only from localhost, what should you change?
d. Calculate the total number of seconds that cached items will remain valid.
e. Explain the difference between the **[feature_flags]** and **[[feature_flags]]** syntax.

3. **Design a ML pipeline using JSON and TOML** with the following features:
    a. Implement the model inference using Pytorch using pre-trained Resnet 34,50,101,152 layers. - 5 Marks
    b. Specify the data source and model architecture using JSON - 3 marks
    c. Define the model parameters such as learning rate, etc for each architecture using TOML - 3 Marks
    d. Integrate the subquestion (b) and (c) leading to a pipeline - 3 Marks
    e. Perform hyperparameter tuning (Grid search using JSON) by using learning rates = [0.1, 0.01, 0.01], optimizers = [adam, sgd] and momentum = [0.5, 0.9] - 3 Marks

For question 1 and 2, merge the answers into a single PDF file. Zip the PDF file with question 3 .py (Python program) and upload the Zip file. The code should be submitted as a python file for evaluation.