Monitoring (Prometheus) Task 2

1-How do I trigger a Prometheus alert?

Prometheus alerts are triggered based on defined alerting rules. These rules are written in Prometheus' Alerting Rules language. When the rule's condition is met, the alert is fired and sent to an alert manager (such as Alertmanager) for further processing, like sending notifications.

- I made example for alerting cpu usage

```yaml
- name: example
  rules:
  - alert: HighCpuUsage
    expr: node_cpu_seconds_total{mode="idle"} < 10
    for: 5m
    labels:
      severity: warning
    annotations:
      summary: High CPU usage on instance {{ $labels.instance }}
      description: "The instance {{ $labels.instance }} is experiencing high CPU usage."
```

2-What is the difference between node exporter and mysql exporter ?

1 - Node Exporter: Node Exporter is used to collect system-level metrics from Linux/Unix machines. It provides various metrics related to CPU, memory, disk, network, and more.

2 - MySQL Exporter: MySQL Exporter is used to collect metrics from MySQL databases. It exposes MySQL-specific metrics like the number of queries, connections, and replication status.

3-What is the maximum retention period to save data in Prometheus and how to increase it ?

The default retention period for data storage in Prometheus is 15 days. However, you can increase it by modifying the (storage.tsdb.retention.time) configuration in the Prometheus server configuration file

```yaml
storage:
  tsdb:
    retention:
      time: 30d
```

4-What are the different PromQL data types available in Prometheus Expression language?

Prometheus Expression Language supports two main data types:
1 - Scalars: Represent single numerical values (e.g., 42, 3.14, etc.).
2 - Vectors: Represent a set of time series data with the same metric name and label sets.

5-How To calculate the average request duration over the last 5 minutes from a histogram ?

Assuming you have a histogram metric named http_request_duration_seconds, you can use the rate() and histogram_quantile() functions to calculate the average request duration over the last 5 minutes:

Ex : avg(rate(http_request_duration_seconds_sum[5m]) / rate(http_request_duration_seconds_count[5m]))

6-What is Thanos Prometheus?

Thanos is an open-source project that extends Prometheus' capabilities by adding long-term storage, high availability, and global view features. It allows you to store historical data in object storage like Amazon S3 and query it globally using the same PromQL language.

7-What is promtool and how i can use it ?

Promtool is a command-line utility that comes bundled with Prometheus. It is used for various tasks, including checking and validating Prometheus rules, configuration files, and recording rules. You can use it to check the syntax and correctness of your configuration and rule files before reloading them into Prometheus.

8-What types of Monitoring can be done via Grafana?

Grafana is a versatile visualization tool that can monitor various types of data, including:

1 - System-level metrics (CPU, memory, disk usage) from Node Exporter.
2 - Application-specific metrics exposed by services.
3 - Database performance metrics from MySQL Exporter or other database exporters.
4 - Custom metrics collected from your applications.

9-Can we see different Servers CPU comparison in Grafana

Yes, you can compare the CPU usage of different servers using Grafana. Assuming you have CPU usage data labeled with the server's name (e.g., instance="server1" and instance="server2"), you can create a Grafana dashboard with a panel displaying the CPU usage of each server side by side. This will allow you to easily compare CPU usage between different servers over time.