## 1.1

1. Please complete the following sentence.

The traditional project management standard is based on the *waterfall method*.

1. Which of the following is not a TPM process?

* Initiating
* Execution
* *Testing*
* Monitoring

1. What are the main approaches based on TPM?

*PMBOK and PRINCE2*

1. Which of the following statements about PRINCE2 is correct?

* It can be applied to small projects.
* It cannot be applied to complex projects.
* *It does not guarantee project success.*
* It guarantees project success.

## 1.2

1. Please complete the following sentence.

The Agile methodology is based on an iterative process where projects are divided into small increments called *sprints*.

2. Which of the following roles represents the customer in an Agile team?

* User
* *Product owner*
* Developer
* Project manager

3. What is the main focus of Agile project management?

*Customer satisfaction*

4. Which of the following statement about Agile methodology is correct?

* Developing a product with an Agile-based approach will result in a long time-to-market.
* Time-to-market is not an important factor in Agile.
* *Developing a product with an Agile-based method will result in a shorter time-to-market.*

## 1.3

1. Please complete the following sentence.

The Kanban method is a *visual system* used in project management to organize the workflow.

2. Where is Kanban applicable?

* In all types of projects.
* *In a pull system.*
* In a push system.
* Only at Toyota.

3. Which of the following is not part of a Kanban board?

* to do
* in progress
* *test*
* done

## 1.4

1. Please complete the following sentence.

Agile Scrum is a project management method used to lead development teams through *iteration loops* in order to achieve incremental and product results.

2. Which of the following is one of the main principles of Agile Scrum?

* Change
* *Transparency*
* Control
* Monitor

3. Which of the following events is not part of Scrum?

* *Kickoff meeting*
* Sprint planning
* Sprint review
* Daily scrum

4. Who is responsible for the sprint backlog?

* Product owner
* Scrum master
* Developer
* *Developer team*

## 1.5

1. Which of the following activities is not part of the extreme programming rules?

* Doing extensive coding
* Unit-testing
* Listening
* *Sprint planning*

2. Complete the following sentence.

In Scrum of Scrum, *the product owners* are responsible for communicating and sharing demand and scope between teams.

3. On what principles is the structure work culture of Scrumban based?

* Scrum
* *Kanban*
* TPM
* Kanban board

4. Which of the following statements about lean management is true?

* It is about managing customers.
* It is about managing the project development processes.
* *It is about respecting the client, improving the work process, and achieving the project’s goals.*
* It is about managing the work environment.

## 1.6

1. Which of the following adjectives best describes the traditional project management approach?

* iterative
* adaptive
* *linear*
* non-linear

2. Which of the following is a characteristic of Agile project management?

* No changes
* *Close customer relations*
* Suitable for large scale projects
* Need for formal documentation

3. Which of the following statements regarding the project management model of a data science team is true?

* It can easily use Kanban.
* It can easily use Scrum.
* *It needs to find the best model by mixing Agile methods.*
* It can easily use Agile.

## 2.1

1. Please mark the correct statements.

* DevOps is software tool.
* DevOps is technology.
* *DevOps is a corporate culture.*
* DevOps is an agile framework.

1. Please mark the correct statements.

* Monitoring of data traffic is the task of developer.
* *Monitoring of data traffic is the task of operations.*
* Monitoring of data traffic is the task of both developer and operations.
* None of developers or operations is responsible for monitoring of data traffic.

1. Please complete the following sentence:

Through the consistent implementation of Application Lifecycle Management by means of continuous *integration* and continuous *delivery*, shortcomings in the creation chain of a solution are detected very early on.

## 2.2

1. Which of the following is more important to DevOps?

* *Culture and procedures*
* Organization
* Continuous integration
* Continuous delivery

2. How are infrastructures defined by Infrastructure as Code?

* C# Code
* Java Code
* Python Code
* *Text*

3. Please complete the following sentence.

SRE and *DevOps* are two trending disciplines with quite a bit of overlap. SRE incorporates the fields of *software engineering* and operations.

## 2.3

1. Which of the following defines the idea of the two-pizza teams?

* The most powerful team is big enough that two pizzas can feed the whole team.
* The least powerful team is so big that two pizzas can feed the whole team.
* *The most powerful team is small enough that two pizzas can to feed the whole team.*
* The least powerful team is so small that two pizzas can feed the whole team.

2. Please mark the correct statements.

* *You should only have one repository for an individual application to make CI/CD pipelines simpler.*
* You should only have one repository for an individual application to decrease the cost of the project.
* You should have at least two repositories for an individual application to make CI/CD pipelines simpler.
* You should not have more than two repositories for an individual application to make CI/CD pipelines realizable.

3. Please complete the following sentence.

The idea of *microservices* architecture has emerged from a collection of popular DevOps ideas generated by many successful companies. In many cases, these companies began with *monolithic* applications.

## 2.4

1. Please mark the correct statements.

* Docker will read the image and construct a container that runs on Linux platforms.
* Docker will read the container and construct an image that runs on all platforms.
* *Docker will read the image and construct a container that runs on all platforms.*
* Docker will read the container and construct an image that runs on Linux platforms.

2. Please mark the correct statements.

* Dockerfile is a shell script that contains commands to create an image*.*
* *Dockerfile is a text file that contains commands to create an image.*
* Dockerfile is a text file that contains commands to create a container*.*
* Dockerfile is a shell script that contains commands to create a container*.*

3. Please complete the following sentence.

Ansible is one of the methods that are preferably used to *automate* operations that would otherwise have to be carried out *manually* with much more effort.

## 2.5

1. Please mark the correct statements.

* Kubernetes is an open source tool for creation of containers.
* *Kubernetes is an open source tool for orchestration of containers.*
* Kubernetes is an open source tool for container recovery.
* Kubernetes is an open source tool for container documentation.

2. Please mark the correct statements.

* Docker Swarm is based on a microservice architecture.
* Docker Swarm is based on an event-driven architecture.
* *Docker Swarm is based on a master-slave architecture.*
* Docker Swarm is based on a model-view-controller architecture.

3. Please complete the following sentence.

In Docker Swarm terminology, the term *service* describes an abstract structure used to define tasks that are to be executed in the cluster.

## 3.1

1. The main goal of which of the following is to test the software product from the viewpoint of the user by simulation the real user scenarios.

* + *E2E testing*
  + Integration testing
  + System testing
  + Nonfunctional acceptance testing

2. Which kind of testing is performed to assess how the users could easily accomplish their defined goals with the software?

* + Exploratory
  + *Usability*
  + Showcase
  + All of them

3. Define a non-deterministic algorithm.

*Non-deterministic is a concept from theoretical computer science, in which algorithms or machines can not only perform exactly one calculation for a certain input (deterministic), but there are several possibilities for the transition to the next state for the same input*.

## 3.2

1. Which of the following is NOT a part of the behavior-driven development natural language feature structure?
   * Given
   * When
   * Then
   * *How*
2. Which of the following aims to provide a sharing understanding of how an application should behave by discovering new features based on concrete examples?
   * Waterfall development approach
   * *Behavior-driven development approach*
   * Test-driven development approach
   * Acceptance test-driven development approach

## 3.3

1. Which type of testing is re-executing the functional and nonfunctional test on an already tested software product to check if the software passes the test after applying some new modifications?
   * Performance
   * System
   * *Regression*
   * Unit
2. Name six steps of an ML model CI/CD.

*Development and Experiment*

*Pipeline CI*

*Pipeline CD*

*Continuous Training*

*Continuous Delivery*

*Monitoring*

## 3.4

1. Name three states of a file in a Git project.

*Modified*

*staged*

*committed*

1. Please complete the following sentence:

Like Git, at the core of a GitHub project is a *project repository.*

## 3.5

1. What is the advantage of storing the Python Notebooks in a JSON format?

*One advantage is file facilitates the version control of the code.*

1. What is the internal type of a Jupyter Notebook file?
   * XML
   * TEXT
   * *JSON*
   * HTML
2. How does one denote the name extension of a Jupyter Notebook file?
   * .css
   * .html
   * .txt
   * .*ipynb*

## 4.1

1. Please list at least five API types.

*Operating system, command line interface, programming language, database, programming library or framework, remote procedure call, web interface, graphical user interface.*

2. Name five basic operation types of the HTTP protocol.

*GET, POST, PUT, DELETE, PATCH, HEAD, OPTIONS, TRACE, CONNECT.*

3. Please mark the correct statements.

* *CPython is the most popular implementation of Python*.
* CPython is managed by a non-profit consortium.
* There is a Java-based implementation of Python called PyPy.

4. Please complete the following sentence.

An API defines a *contract* between the application *developer/provider* and the *user/consumer* of the software.

## 4.2

1. Please list at least six dimensions of the cognitive dimensions framework for good API design.

*Abstraction level, learning style, working framework, work, step, unit, progressive evaluation, premature commitment, penetrability, API elaboration, API viscosity, consistency, role expressiveness, domain correspondence*

1. Please complete the following sentences:

* When throwing an error, fail as *early* possible. Your error messages should be *human-readable* and help the user to *fix* their problem.

1. Please mark the correct statements from the Zen of Python.

* *Beautiful is better than ugly*.
* Errors should always pass silently. Unless made explicit.
* Simple is better than complex. Complex is better than complicated.

1. Please complete the following sentence.

In API design a good rule of thumb to follow is *convention* over *configuration* over *code*.

## 4.3

1. Please complete the following sentence.

Making choices in API design always results in *trade-offs*, ultimately your users will have to determine what they like most.

## 5.1

* + - 1. Please mark the correct statements.
* Model development is a deterministic and predictable process with reliable outcomes.
* *The data science process is an exploratory process with many feedback loops.*
* *Understanding the problem and the business is essential to developing a good model.*
* We can develop a good model no matter what kind of data we have.
  + - 1. Please complete the following sentence.

Supervised learning maps *input data* to *known output data*.

## 5.2

1. Please list the three ways in which the data we use for our models can change.

*Gradual change over time, recurring or cyclical change, sudden or abrupt change*

1. Please list at least four processes we want to monitor in a production machine learning system.

*Model inputs, model outputs, model interpretability outputs, user action and rewards, model fairness, model computational performance*

## 5.3

1. Please list three ways in which the machine learning development and deployment process differs from the standard software development and deployment process.

*The team contains data scientist, with different skillsets.*

*The development process is experimental and non-deterministic.*

*Testing an ML system includes elements not present in other software systems, including data validation, trained model quality evaluation, and model validation.*

*Machine learning systems can require deployment in a multi-step pipeline to automatically retrain and deploy model.*

*Monitoring needs to make sure that we are informed if the model performance decay.*

1. Please complete the following sentence.

MLOps is a practice for collaboration and communication between *data scientists* and operations professionals to help manage the *production machine learning lifecycle*.

## 5.4

1. Please complete the following sentence.

Machine learning as a service refers to various *cloud-based platforms* that cover many or most *infrastructure issues* for MLOps.

1. The benefits of using machine learning cloud solutions include which of the following?

* being able to start small scale on demand
* freedom to change provider and solution
* open-source software
* lowered infrastructure costs
* *integrated tools for deployment and monitoring*