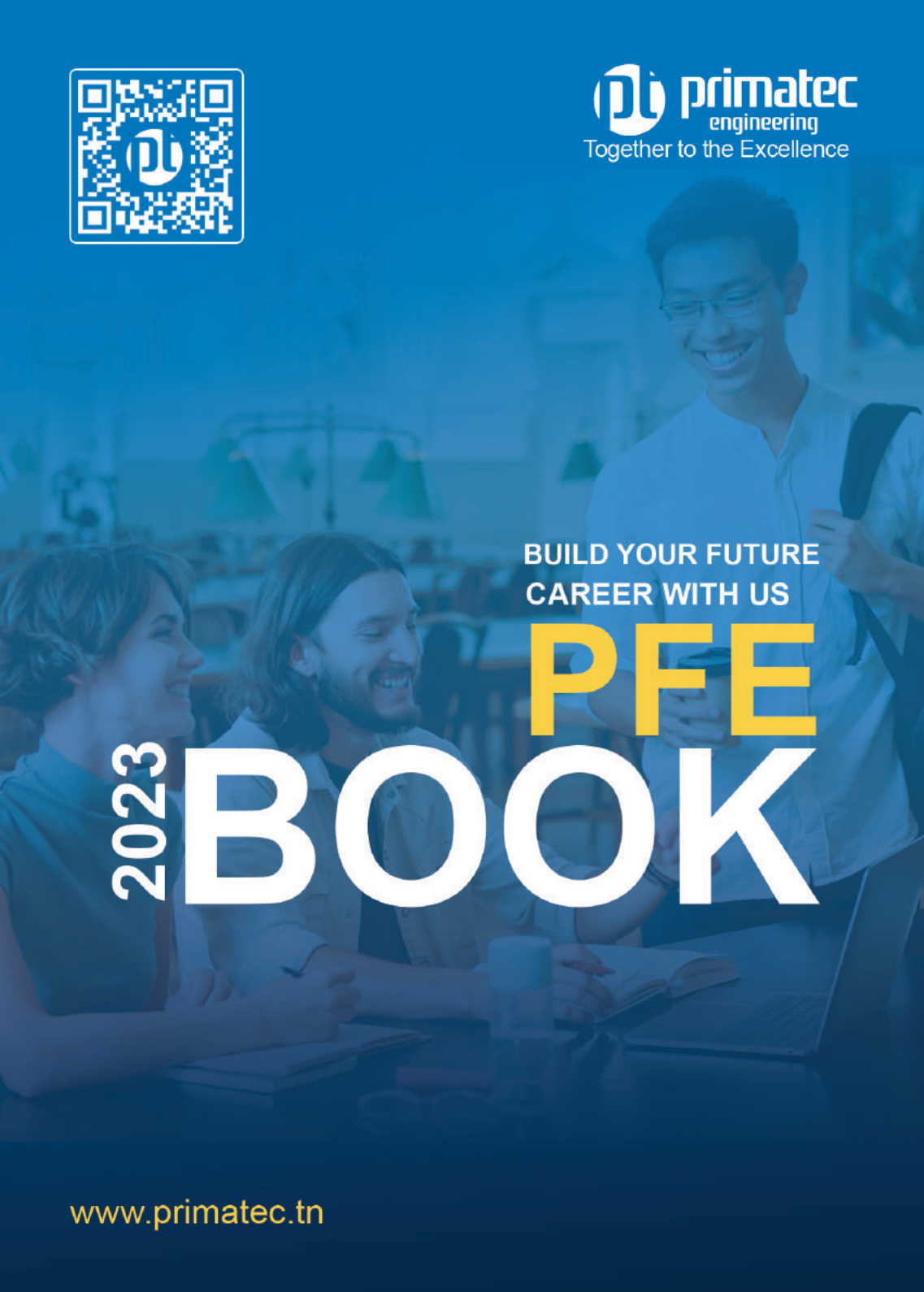
primatec
engineering
Together to the Excellence



BUILD YOUR FUTURE
CAREER WITH US

PFE BOOK 2023

www.primatec.tn

Hello

www.primatec.tn

Summary

About us

We are at **Primatec** a group of young skilled engineers and experts united to build a better future together.We are dedicated to providing the lastest, most cost-effective and reliable hardware and software to meet proficiency in ECU testing for the automotive industry.

Primatec at a glance

+10 years
Experience of Engineering

+40 000 k
Covred customer requirements

+400
Employing Engineers

+100 000 k
Automated test scenarios

Domain

AUTOMOTIVE ENGINEERING AND TESTING SERVICES

Area of expertise

Vehicule Body and Comfort Electronics Testing

- Confort functions
- Energy managment
- Interior and exterior Light
- Car Access
- Entertainment
- Car sharing

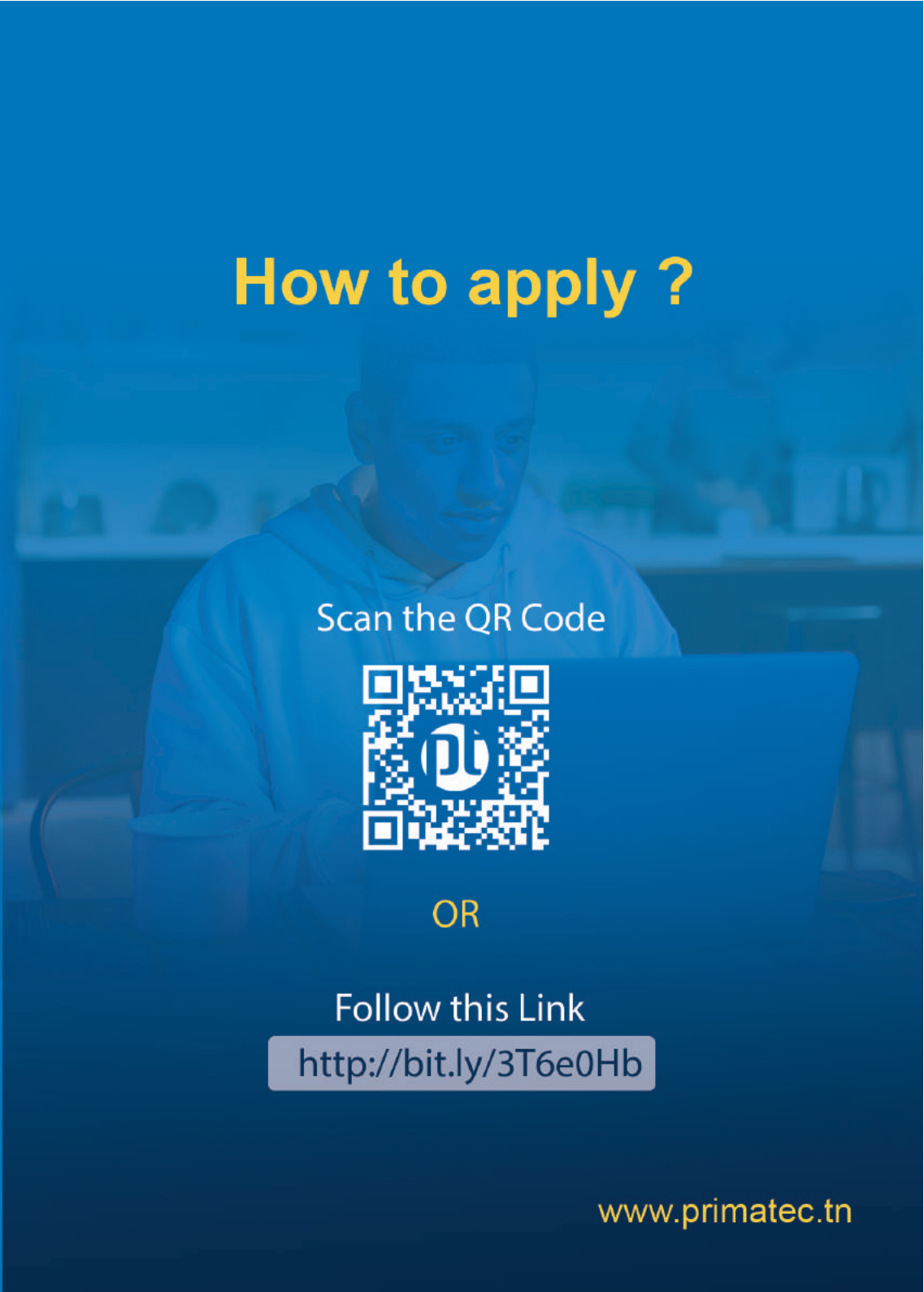
In-Vehicule Networks Testing

- Gateways
- Automotive Ethernet
- CAN/CAN FD
- FlexRay
- LIN

Functional Safety and Security Testing

- Hazard analysis and risk assessment ASILratings
- Technical Safety Requirement analysis and testing
- Safety processes and documentation management in compliance with ISO-26262 standard

How to apply ?



Scan the QR Code

OR

Follow this Link

http://bit.ly/3T6e0Hb

www.primatec.tn

List of projects

01	ARXML Editor	4 To 6 Months
02	Implement diagnostics plugin in ProxyApp	4 To 6 Months
03	Functional Tests scripts Generator	4 To 6 Months
04	Optimization ProxyApp plugins	4 To 6 Months
05	Automotive Testing Hardware Emulation	4 To 6 Months
06	Can Database Viewer and Editor	4 To 6 Months
07	Ethernet Database Viewer and Editor	4 To 6 Months
08	Full Stack app for Test Management Activities	5 Months
09	A Web-based tool for the ML workflow design and handling	4 Months
10	Full Stack app for Test Management Activities	5 Months
11	Offline Gateway Routing Analysis	6 Months
12	Test Bench setup preparation tool	6 Months

List of projects

13	Task Management integration into Development tools	6 Months
14	Customized automotive widgets	6 Months
15	HTML Car topology viewer	6 Months
16	Statistics dashboards based on Robot framework reports	6 Months
17	Requirements clustering based on ML	6 Months
18	Clustering validation result tool	6 Months
09	Diagnoser tool	6 Months
20	Migrate applications to Kubernetes	6 Months
21	Automates DevOps tools configuration	6 Months
22	Offline analyzer	4-5 Months
23	Ticket creator and checker	4-5 Months

ARXML Editor

01

Objectives

An ARXML file is a configuration file saved as AUTOSAR XML (ARXML) format. It is used by AUTOSAR, an initiative of automotive manufacturers and suppliers formed in 2003 to establish software architecture for automotive electronic control units (ECUs). ARXML files contain configuration and specification information in XML format for an ECU, which is used to control components of an engine to make sure an engine achieves optimal performance.

Writing an ARXML file is a heavy task, especially with the high probability of making mistakes due its special structure that should be followed (described in *.xsd file).

Currently, there is no a free tool/editor that could be used, so the purpose of this internship project is to develop an editor that make this task easier and reduce the chance of making errors.

Required tasks

Understand the schema described in *.xsd file.
Design and implement a GUI that allow to parse existing ARXML files , edit them and generate new ones that respects the schema

Object Oriented Programming
Analytical Skills

Computer Science Engineer

4 to 6 Months

1

Keywords

AUTOSAR, ARXML, C++,
Qt, GUI, Cross-Platform

Technology

Implement diagnostics plugin in ProxyApp

02

Objectives

ProxyApp is an adaptive application for integration testing purpose for BMW group in the context of xPAD project (PAD stands for Platform for Autonomous Driving).
It is a C++ application based on Adaptive AUTomotive Open System ARchitecture (AUTOSAR) specification (https://www.autosar.org/standards/adaptive-platform/) to communicate with different clusters and software components in xPAD software.
ProxyApp is a plugin-based architecture. Each plugin represents a library for an ARA (AUTOSAR Runtime for adaptive Applications) cluster or a software component in xPAD software.
In this context, the purpose of this project is to implement diagnostics test library to ensure integration testing for ARA::DIAG cluster (https://www.autosar.org/fileadmin/user_upload/standards/adaptive/20-11/AUTOSAR_SWS_Diagnostics.pdf).

Required tasks

Understand the proxyApp application architecture
- Design and implement the new diag plugin based on AUTOSAR architecture.
- Modify ProxyApp to load and use this new plugin.

Keywords

AUTOSAR, Linux, C++, Basel, QEMU

Technology

POO, Specification, and design
C++, Basel, Linux QEMU

Computer Science Engineer

4 to 6 Months

1

Functional Tests scripts Generator

03

Objectives

Functional testing is a type of testing that seeks to establish whether each application feature works as per the software requirements.

In the context of xPAD project we send SOME/IP frames to the hardware emulator (Qemu) to execute a specific scenario, in order to test our implementation or reproduce a bugs.
The payload of those frames are stored in json format.

Writing a test scenario or analyzing its results require a high attention and may contain errors.
So the purpose of this internship project is to develop a desktop application on Linux environment to aid the developer to write, execute and analyze functional tests.

Required tasks

- Understand the messages structures stored in .proto files.
- Design and development a GUI interface that aid the user to write functional tests in a guided way to reduce the probability of errors, this GUI should be able to open existing scenarios and execute them, and present their results (PASSED/FAILED).

Keywords

SOME/IP, C++, Qt, GUI, Protobuf, Linux, Functional Testing, Qemu

Technology

Object Oriented Programming, Analytical Skills

Computer Science Engineer

4 to 6 Months

1

Optimization ProxyApp plugins

04

Objectives

ProxyApp is an adaptive application for integration testing purpose for BMW group in the context of xPAD project (PAD stands for Platform for Autonomous Driving).
It is a C++ application based on Adaptive AUTomotive Open System ARchitecture (AUTOSAR) specification (https://www.autosar.org/standards/adaptive-platform/) to communicate with different clusters and software components in xPAD software.
ProxyApp is a plugin-based architecture. Each plugin represents a shared-object library for an ARA (AUTOSAR Runtime for adaptive Applications) cluster or a software component in xPAD software.
As loading these plugins takes time, the purpose of this project is to modify App proxy architecture so as not to use plugins and try to make a comparative performance measurement for both 2 solutions: the current ProxyApp based on plugins and the new solution.

Required tasks

Understand the proxyApp application architecture
- Design and implement the new architecture (without plugins)
- Performance improvement.
- Make a comparative performance measurement for both solutions

POO, Specification, and design
C++, Basel, Linux QEMU

Computer Science Engineer

4 to 6 Months

1

Keywords

AUTOSAR, Linux, C++, Basel, QEMU

Technology

Automotive Testing Hardware Emulation

05

Objectives

Several teams are working with BTS HW Boards (Body Electronic Test System) and CM (capture models) devices to test Automotive ECUs.
The team is growing, which has increased the need for these devices and since the hardware is limited, we come up with the idea to emulate these hardware devices.
Emulate some automotive hardware devices used in automotive testing industry (BTS/CM) to decrease (as much as possible) the physical dependence on these devices.

Required tasks

Simulate the initialization of some automotive hardware (BTS/CM).
- Simulate frames sending/receiving over LIN/ CAN /Flexray busses.
- Simulate hardware signals events (analogue/digital signals).

Keywords

C++ , Python , Qt , Network protocols
Automotive Testing Hardware

Technology

Problem solving, POO, C++ programming skills

Computer Science Engineer

4 to 6 Months

1

Can Database Viewer and Editor

06

Objectives

Build a tool that allows having a global view of the ethernet databases (information about ECUs, messages, signals…). This tool will be a centralized place to get any information about the contents of the database.
the tool allows editing the database and exporting it .

Required tasks

- Understand xml, arxml and db files.
- Design and implement a GUI that allow to parse the database files, edit them and generate new ones that respects the schema.

Object Oriented Programming, SQL, Specification, and design

Software Engineering

Keywords

CAN,LIN,FleXray, Db file, sql, ARXML, XML, GUI

4 to 6 Months

Technology

Oriented Object Programming

1

Ethernet Database Viewer and Editor

07

Objectives

Build a tool that allows to have a global view of the ethernet databases (information about ECUs, services, methods…). This tool will be a centralized place to get any information about the contents of the database.
the tool allows editing the database and exporting it .

Required tasks

- Understand xml, arxml and db files.
- Design and implement a GUI that allow to parse the database files, edit them and generate new ones that respects the schema.

POO, Specification, and design
C++, Basel, Linux QEMU

Computer Science Engineer

Keywords

Ethernet, Db file, sql, ARXML, XML, GUI

4 to 6 Months

Technology

Oriented Object Programming

1

Full Stack app for Test Management Activities

08

Objectives

Implement Full stack application for Test Management Activities. This application will help our testers and Manager in their daily tasks (Centralizer the data, user-friendly GUI, ...)
The developer will be involved in the whole test and dev process to be able to design and implement the target product.
As a frontend app, the candidate will use ReactJS/ ViewJS as web framework.
For the backend app, it will be Spring boot app (java 11).
The deployment of this application should be automatized via the DevOps process.

Required tasks

- Analyze and Design
- implement backend API
- implement frontend app
- Autonomous deployment
- Data indexation via Elastic Search

Software Engineering

Software Engineering

Keywords

Java/SpringBoot, ReactJS/ViewJS , PL/SQL, DevOps, Test Activities, Test Management process, Elastic Search

5 Months

Technology

2

A Web-based tool for the ML workflow design and handling

09

Objectives

The goal of the desired tool is to develop a user-friendly tool to design the ML workflow. The desired tool allows also to design all tasks of an ML process based on graphic components and an intuitive user interface. Also, the tool ensures the setting of the different steps of ML projects.

Required tasks

- understand the ML workflow
- implement frontend app
- Autonomous deployment

Software Engineering

Software Engineering

Keywords

Python, Django,flask, React JS

Technology

4 Months

1

Full Stack app for Test Management Activities

10

Objectives

Implement Full stack application for Test Management Activities. This application will help our testers and Manager in their daily tasks (Centralizer the data, user-friendly GUI, …).
The developer will be involved on the whole test and dev process to be able to design and implement the target product.
The frontend app will be implemented via .net DevExpress framework.
The backend app, it will be ASP .NET app.
The deployment of this application should be automatized via DevOps process.

Required tasks

- Analyze and Design
- implement backend API
- implement frontend app

Software Engineering

Software Engineering

Keywords

.Net, C#, asp .Net, PL/SQL, DevExpres,

Technology

5 Months

2

Offline Gateway Routing Analysis

11

Objectives

A tool needed to be able to read gateway table and the pcap trace then dynamically detect routing bugs .

Required tasks

A tool needed to be able to:
- Parse a gateway table (json file) and represents it in a GUI: enable to user to search by PDU, signal, ID …
- Takes as input a gateway table and the generated pcap trace and detects dynamically the routing bugs
- Generates a detailed report containing the routing bugs.

Keywords

Gateway Table, Ethernet, Json, Routing, bugs, report, pcap

Technology

Winforms or WPF

Computer Engineering Student

Computer Science Engineer

6 Months

1

Test Bench Setup Preparation Tool

12

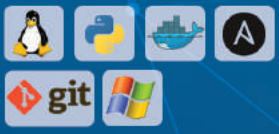
Objectives

The goal of this project is to prepare Testbenches from scratch. The preparation will be done automatically using open-source tools such as Packer ,Ansible, Docker, etc…
Both Windows and Linux will be supported. Also, new added tools and software should be possible to be deploy remotely.

Keywords

Python, Docker, Ansible, Shell, GIT

Technology



Computer Science Engineer

Problem solving, POO, Python programming skills, GIT

6 Months

1

Task Management Integration into Development Tools

13

Objectives

Customizable task management plugins in the Test development environment that enables:
- Ability to check assigned tasks and due dates
- Ability to create tickets for team members
- Automated notification when the deadline is reached

Technology

Computer Science Engineer

Computer Engineering Student

6 Months

1

Customized Automotive Widgets

14

Objectives

Plugin based customized widgets for automotive testing. Different module to be implemented as a dll and loaded to the Panel configurator view to make runtime functional test on the testbench

Technology

Computer Science Engineer

Computer Engineering Student

6 Months

1

HTML Car Topology Viewer

15

Objectives

Evaluate python graph libraries to define a complex ecu to ecu relations in the car model. Interactive and customized network with customized filters

Technology

Computer Science Engineer

Computer Engineering Student

6 Months

1

Statistics Dashboards Based on Robot Framework Reports

16

Objectives

Rebot framework is generating J-unit standard report that could be used to make statistics dashboards: history view, average execution time, most found errors

Keywords

Rebot framework , Python, javascript

Technology

Computer Science Engineer

Computer Engineering Student

6 Months

1

Requirements Clustering Based on ML

17

Objectives

Automate as much as possible requirements analysis task to define:
- Test level
- Domain
- Feature
- Complexity

Based on Machine learning model generated from old classification made.

Technology

Computer Science Engineer

Computer Engineering Student

6 Months

1

Clustering Validation Result Tool

18

Objectives

RunTime result clustering tool to help on:
- Early detection of blockers
- Reduce analysis time by grouping Tcs by errors
- Comparison based approach integration
- Early detection of defective execution
- Runtime Test Execution plan adjustment

Technology

Computer Science Engineer

Computer Engineering Student

6 Months

1

Diagnoser Tool

19

Objectives

UDS standalone module over DoIP and CAN using Technica HW. Server and client mode should be supported

Technology

web app

Computer Science Engineer

Computer Engineering Student

6 Months

1

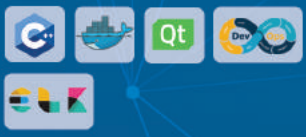
Migrate Applications to Kubernetes

20

Objectives

- Setup a K8s cluster
- Build a docker image for each project
- Building a robust CI/CD pipeline with GitLab CI
- K8S monitoring module

Technology



Computer Science Engineer

Computer Engineering Student

6 Months

1

Automates DevOps Tools Configuration

21

Objectives

- Automatic creation of jenkins file
- Automatic creation of docker files
- Automatic creation of Gitlab ci module

Technology

Computer Science Engineer

Computer Engineering Student

6 Months

1

Offline Analyzer

22

Objectives

Designing and implementing a tool to automate the checks of some Test results (OS partition switch, up/down flash, svn versions, etc…). Those checks will be based on traces available in our platform. The logic of the checks will be provided. The tool shall also give a GUI to select suitable builds where we can find traces.

Technology

Computer Science Engineer

Computer Engineering Student

4-5 Months

2

Ticket Creator and Checker

23

Objectives

Designing and implementing a tool to create a bug/task according to a predefined template. All quality checks (affect version, occurrence, variant, initial SW, target SW, etc.., correct traces, etc.) logic shall be implemented.

Technology

Computer Science Engineer

Computer Engineering Student

4-5 Months

1

Thank You

www.primatec.tn

+216 39 152 300

info@primatec.tn

www.primatec.tn

Sfax Technopark, Ons
City, Tunis Road Km 9

primatec
engineering
Together to the Excellence

Together
to the
Excellence

www.primatec.tn