



# PA181

## Term Project

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# About

- term project
- team project
- cloud native
- something useful



# Idea

- system for user self-testing
- users are able to test themselves
- users can add new tests
- multilingual
- good for exams preparation



# Work Division

## ■ Jan Ondruch

- specifications
- design
- testing

## ■ Jiří Čechák

- design
- frontend
- testing
- bug fixing

## ■ Tadeáš Pavlík

- analysis
- design
- testing

# Work Division

## ■ Adrián Tóth

- configuration
- architecture
- deployment
- documentation
- presentation

## ■ Václav Stehlík

- backend
- interconnection of  
backend & frontend
- troubleshooting
- bug fixing



# Used Tools & Technologies

## Technologies:

- IBM Cloud
- GitHub
- Travis CI

## Tools:

- IBM Cloud DevOps Toolchain
- ASP.NET
- React
- Material-UI

# Application Initialization

- created one private repository
  - hosted on GitHub
- inspired by IBM ASP.NET *'HelloWorld'*<sup>1</sup>
- created project skeleton
  - ASP.NET Core Web API (*webapi*) - the main structure
  - Class library (*classlib*) - several support projects
- configured deployment
  - before the development itself
  - on a clean *'HelloWorld'* application
- configured automation pipeline
  - IBM Cloud DevOps Toolchain

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<sup>1</sup>[github.com/IBM-Cloud/aspnet-core-helloworld](https://github.com/IBM-Cloud/aspnet-core-helloworld)



# Application Implementation

## Frontend:

- Material UI components
- connected to the API
- supporting any mode
  - phone
  - tablet
  - desktop

## Backend:

- Model–View–Controller
- multitier architecture
  - API
  - entities
  - repositories
  - services

# Application Deployment

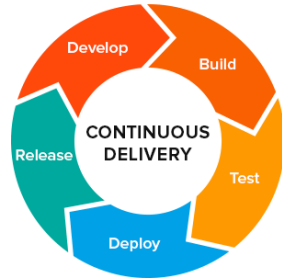
Our work looked like this:

## ■ Manual

- 1 Change code in a local repository
- 2 Commit changes in the local repository
- 3 Update of the remote repository

## ■ Automated

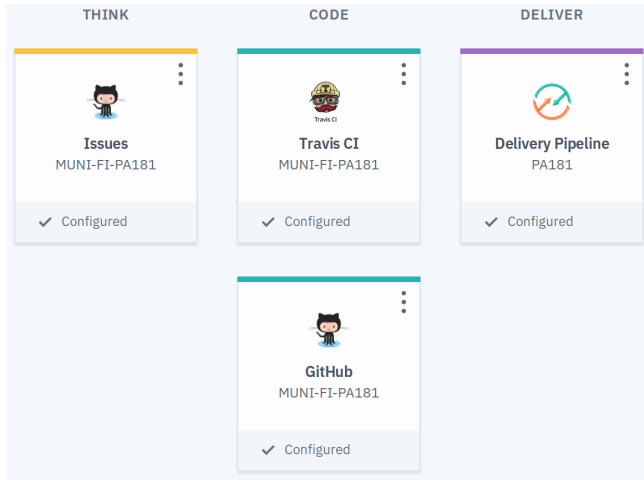
- 4 Test the application
- 5 Build the application from source
- 6 Deploy the built application
- 7 Create a release



**Figure:** Continuous Delivery



# Toolchain



**Figure:** IBM Cloud DevOps Toolchain





# Examples

The following screenshots illustrate our application.




# Example 1

[PREP 4 TESTS](#) [TESTS](#) [ADD NEW TEST](#) [HELP](#) [ABOUT](#) [LOGIN](#) 




## Geology

Number of questions: **3**  
Description: **General knowledge of geology.**




## Mathematics

Number of questions: **3**  
Description: **General knowledge of mathematics.**



## Informatics

Number of questions: **3**  
Description: **General knowledge of informatics.**



## Chemistry

Number of questions: **3**  
Description: **General knowledge of chemistry.**

Figure: list of available tests



## Example 2

PREP 4 TESTS

TESTS

ADD NEW TEST

HELP

ABOUT

LOGIN

$2 + 2 = ?$

Question 1 / 3

MENU

1

4

2

9

PREV

NEXT

Wrongly answered questions:

1

00:00:18

Correct: 0 / 3 (0%)

Description:

Addition

Additional information:

So funny.

Figure: incorrect answer



## Example 3

PREP 4 TESTS

TESTS

ADD NEW TEST

HELP

ABOUT

LOGIN

$2 * 2 = ?$

Question 2 / 3

MENU

00:00:52

Correct: 1 / 3 (33.3%)

Description:

Multiplication

Additional information:

Difficult?

3

1

2

4

PREV

NEXT

Wrongly answered questions:

1

Figure: correct answer



## Example 4

PREP 4 TESTS TESTS ADD NEW TEST HELP ABOUT LOGIN

2 - 2 = ? Question 3 / 3

00:01:31

ect: 1 / 3 (33.3%)

Description:

**Subtraction**

4

2

0

PREV EVALUATE NEXT

Wrongly answered questions:

1

Hide info

Hide statistics

Reset timer

Delete statistics

Start over

Figure: dropdown menu






## Example 5

The screenshot shows a web application interface. At the top is a blue navigation bar with the text 'PREP 4 TESTS' on the left, and 'TESTS', 'ADD NEW TEST', 'HELP', and 'ABOUT' in the center. On the right side of the bar are the words 'LOGIN' and a small flag icon. Below the navigation bar is a white rectangular area containing a login form. The form has two input fields: 'Username' and 'Password'. To the right of the 'Password' field is a blue button with the text 'LOGIN' in white.

Figure: login



## Example 6

[PREP 4 TESTS](#) [TESTS](#) [ADD NEW TEST](#) [HELP](#) [ABOUT](#) [LOGIN](#) 

### New test

Name \*

Language \*

Test as JSON file \*

UPLOAD FILE

Description

\* Required

SUBMIT

**Figure:** add a new test

## Example 7

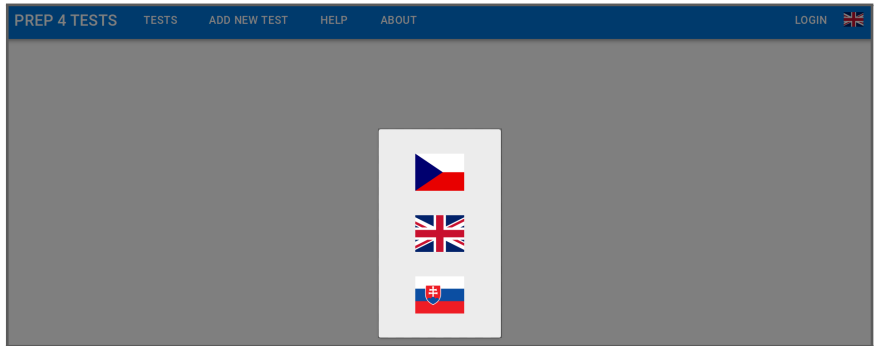



Figure: language selection



## Example 8

PREP 4 TESTS TESTS ADD NEW TEST HELP ABOUT LOGIN 

### Help


Test as JSON file

```
[
  {
    "text": "string",
    "description": "string",
    "afterSubmitFeedback": "string",
    "answers": [
      {
        "text": "string",
        "isCorrect": true
      }
    ]
  }
]
```

- **text** - Question
- **description** - Description
- **afterSubmitFeedback** - Additional information to be displayed after the answers have been evaluated.
- **answers** - Answers
  - **text** - Answer
  - **isCorrect** - true (Correct) / false (Incorrect)

Figure: help

## Example 9

**PREP 4 TESTS**TESTSADD NEW TESTHELPABOUTLOGIN

### About

Title:

**Semestrální projekt pro předmět PA181 (2019)**

Authors:

**Adrián Tóth, Tadeáš Pavlík, Jiří Čechák, Václav Stehlík, Jan Ondruch**

Description:

**Application for user self-testing.**

Source:

**<https://github.com/europ/MUNI-FI-PA181>**

License:

**<https://github.com/europ/MUNI-FI-PA181/blob/master/LICENSE>**

Figure: about



Thank you for your attention!