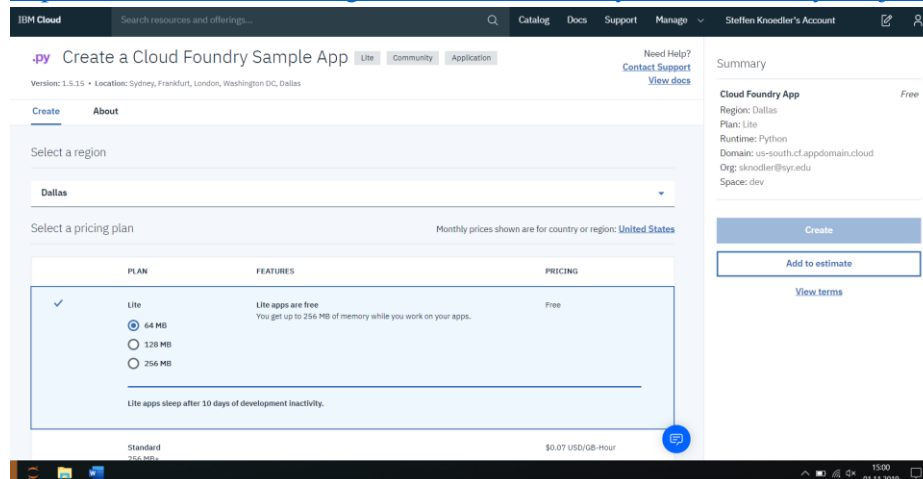


# Homework 5: IBM Cloud

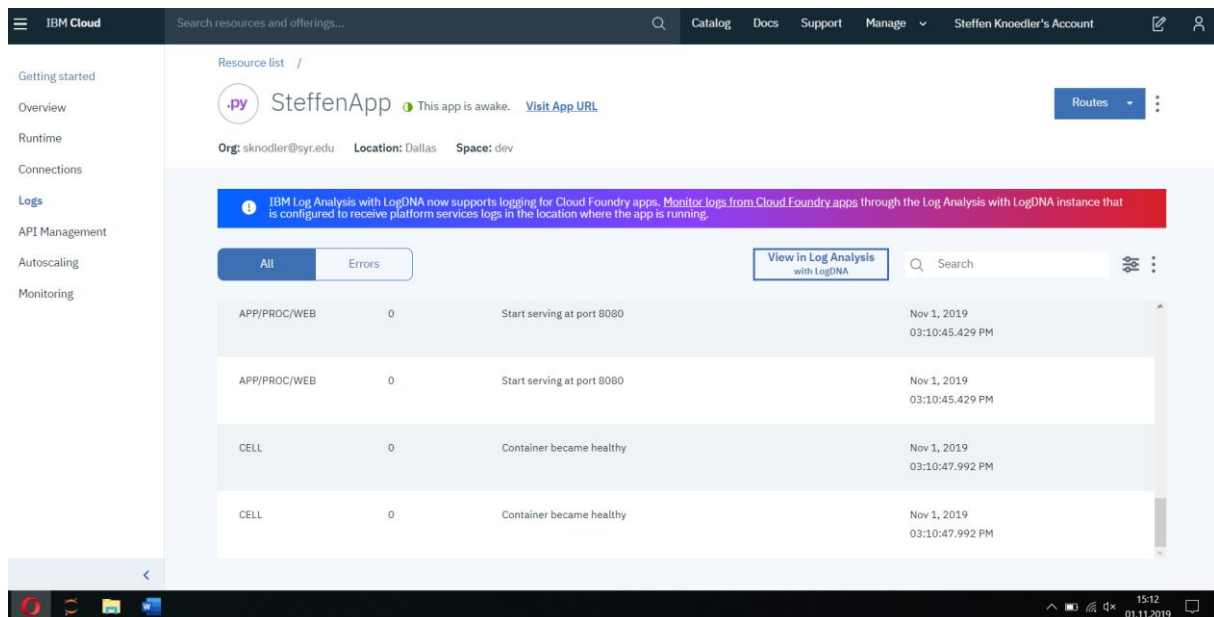
## MODULE 1 - IBM Cloud Foundry Sub-Module

### 1.1 - Create a Cloud Foundry Sample App

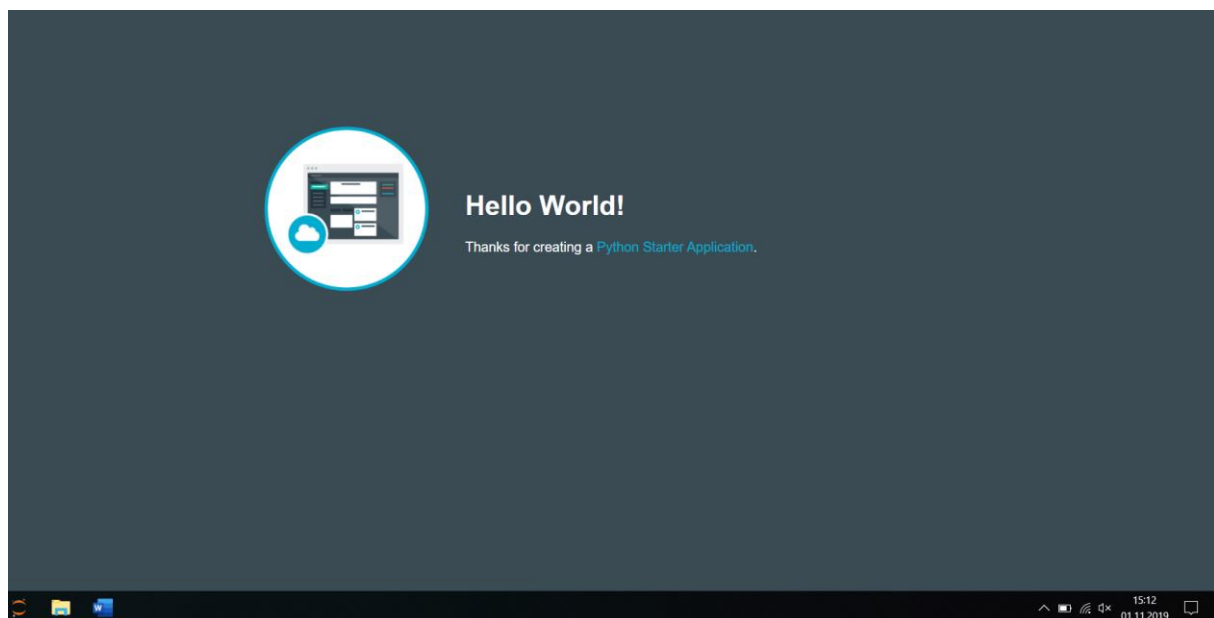
- Go to the link <https://cloud.ibm.com/catalog>
  - Scroll down to 'Offering type' and select the check box 'Cloud Foundry apps'
  - Once you click on Cloud Foundry apps you will be directed to the link below  
[https://cloud.ibm.com/cloudfoundry/overview?bss\\_account=8ef236e9888f4172a90410d2531322ea](https://cloud.ibm.com/cloudfoundry/overview?bss_account=8ef236e9888f4172a90410d2531322ea)
  - Scroll down to "Application Runtimes" and select one of the language runtimes
  - For instance, if you select '.py' you will be redirected the sample app creation link  
<https://cloud.ibm.com/catalog/starters/cloud-foundry?runtime=liberty-for-java>



- Under 'Create' tab select
  - Region - Dallas (for instance)
  - Pricing Plan - Lite 64 MB
  - Runtime - Python
  - App Name - Enter a unique name
  - Host Name - auto populated, will be the same as App Name
  - Domain - mybluemix.net
  - Organization - auto populated, will be the same as your email id
  - Space - dev
  - Tags - optional
- Once you click on 'Create' you will directed to Resource List
- Click 'Logs' in the left navigation to watch the messages as the app builds and is started
  - Watch for a message confirming that the application has started: CELL/0 Container became healthy



- Click 'Routes' and then select the link to your application URL. Alternatively, you can click on 'Visit App URL'
- Your application will be launched in a separate tab



Cloud Foundry is an open-source PaaS that can be used to deploy as well as scale applications without managing any servers. It takes advantage of a container-based architecture that can run applications in any language. I have used cloud foundry to create and host a python web application.

## Sub-Module 1.1 - Questions

**1. What is Cloud Foundry? Describe in brief the high-level Cloud Foundry architecture on IBM Cloud.**

Cloud Foundry is an open-source PaaS that can be used to deploy as well as scale applications without managing any servers. It takes advantage of a container-based architecture that can run applications in any language. The PaaS includes a self-service application-engine to run the application, an automation engine that makes deployment and maintenance possible, a command line to interact with the environment as well as integration of development tools. The architecture follows an open approach, which allows the user to add frameworks and build whatever supplication without worrying about the cloud infrastructure. When using cloud foundry on IBM cloud, the user can use automatic health management service that can restart the application when necessary, automatic routing that automaticcal creazed internet reachable routes for the application, automatic placement that places the app automatically across data centers as well as access control that allows the user to assign certain access to certain people.

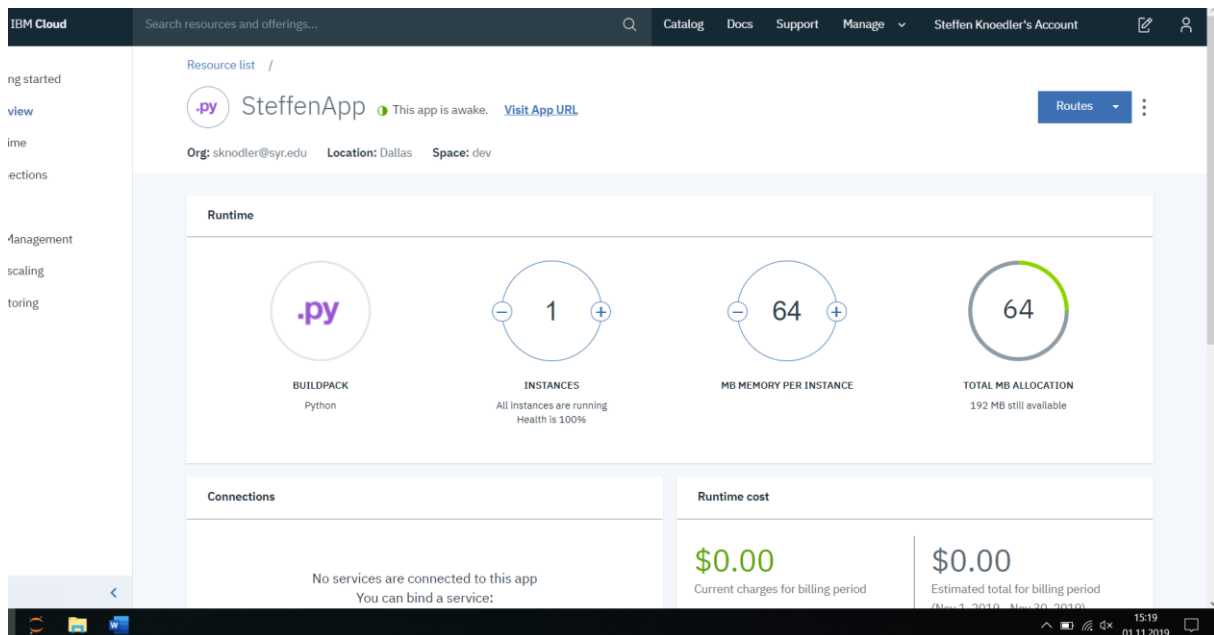
**2. What is Loggregator? Briefly describe the type of logs shown in the Logs dashboard of resource list.**

Loggregator by IBM collects logs as well as metrics from my app to display them at one place.

- STG: This component provides information on how the application is staged
- API: This type shows information about internal actions that come from a request to change the state of the app
- CELL: This type provides information about start, stop and crash of the application
- APP: This type includes logs from the application
- RTR: It provides information about HTTP requests to the app.

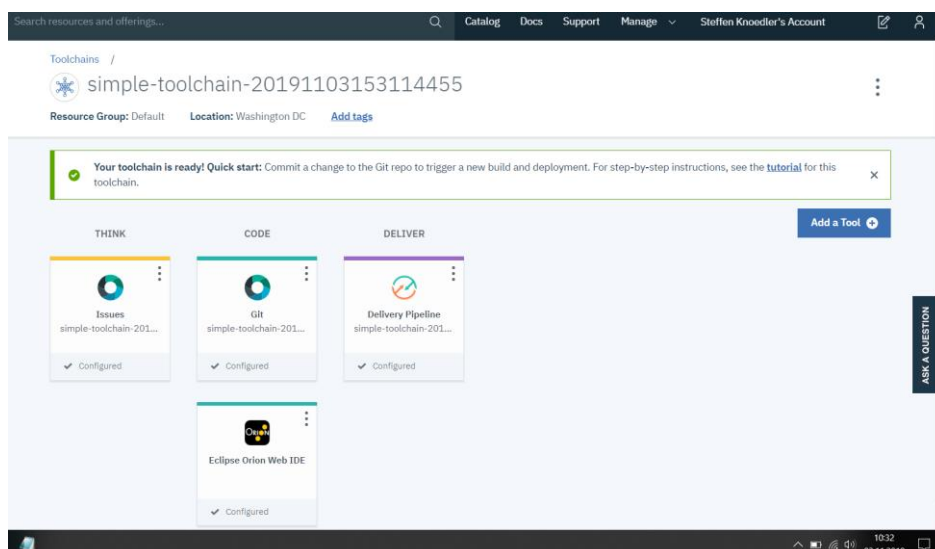
**3. How many instances were created for this app? Attach a relevant snapshot.**

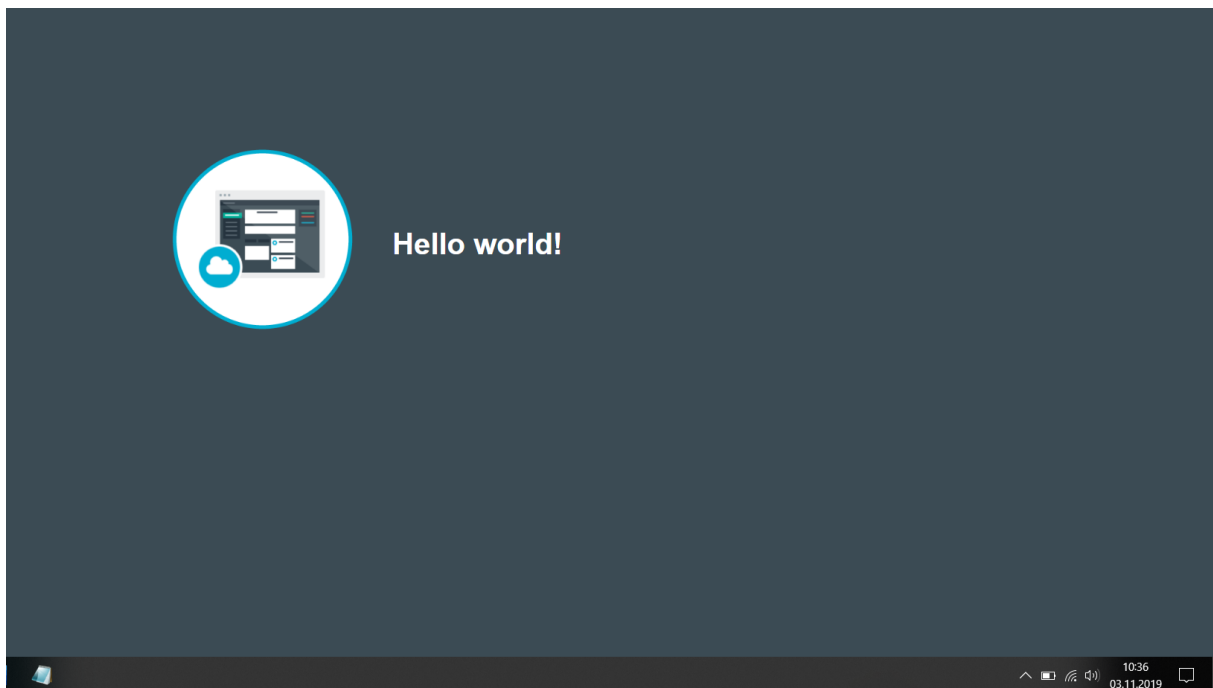
One Instances was created for this app.



## Sub-Module 1.2 - Develop a Cloud Foundry App using Toolchains

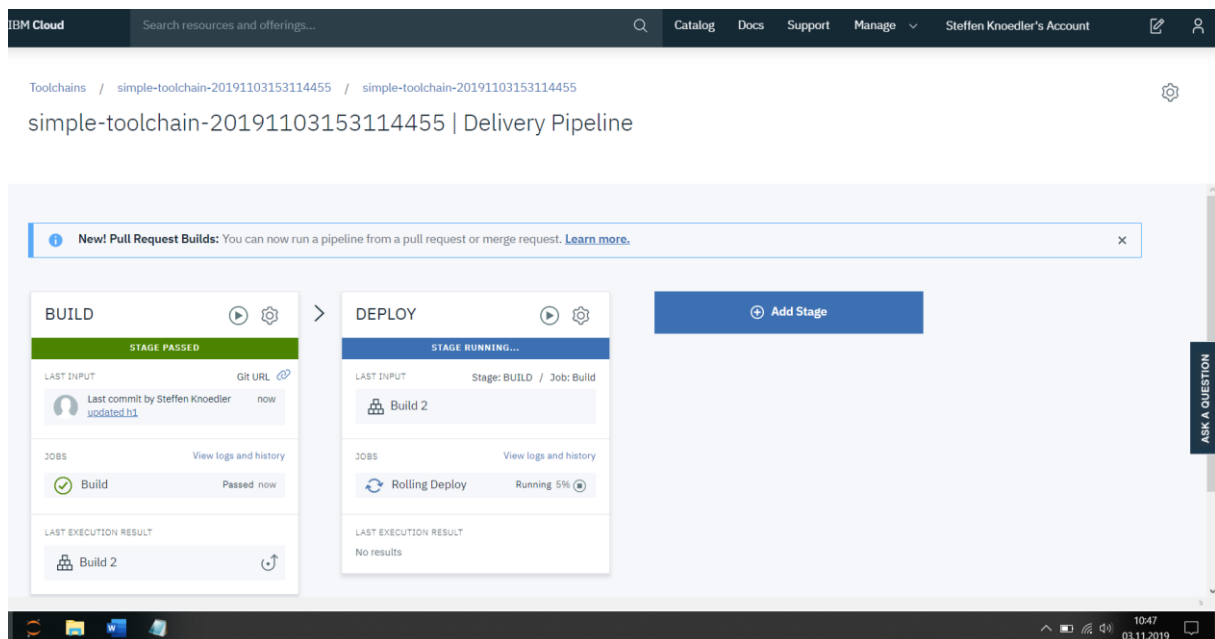
- Go to the course 'Introduce toolchains by using the "Develop a Cloud Foundry app" toolchain'  
<https://www.ibm.com/cloud/garage/tutorials/introduce-develop-cloud-foundry-app-toolchain?task=4>
- Log in to your garage-profile-blue by clicking on 'Login' option on top right corner
- Scroll down and conform with the specified 'Prerequisites' before you start with Tasks
- Task 1: Create a toolchain
  - NOTE: Save the value of API key for later use. To modify the code, you can change any .html part of the code.





I have created a toolchain and hosted a web app on basis of a template. Toolchain is a collection of tools that can help me to develop, deploy as well as operate tasks – needed for my software to run. In this example, I have used a template that already contains a set of tool integrations and code that can be used to deploy a cloud foundry app. It includes services for continuous delivery, source control, issue tracking as well as online editing.

- Task 2: Modify the code



The image shows two side-by-side panels representing different stages of a CI/CD pipeline. The left panel is titled 'BUILD' and has a green header indicating 'STAGE PASSED'. It shows the 'LAST INPUT' as a Git commit by Steffen Knoedler 6 minutes ago. Under 'JOBS', the 'Build' job is shown as 'Passed 6m ago'. The 'LAST EXECUTION RESULT' shows 'Build 2'. The right panel is titled 'DEPLOY' and has a red header indicating 'STAGE FAILED'. It shows the 'LAST INPUT' as 'Stage: BUILD / Job: Build'. Under 'JOBS', the 'Rolling Deploy' job is shown as 'Failed now'. The 'LAST EXECUTION RESULT' shows 'No results'.

Staging app and tracing logs...

**FAILED**

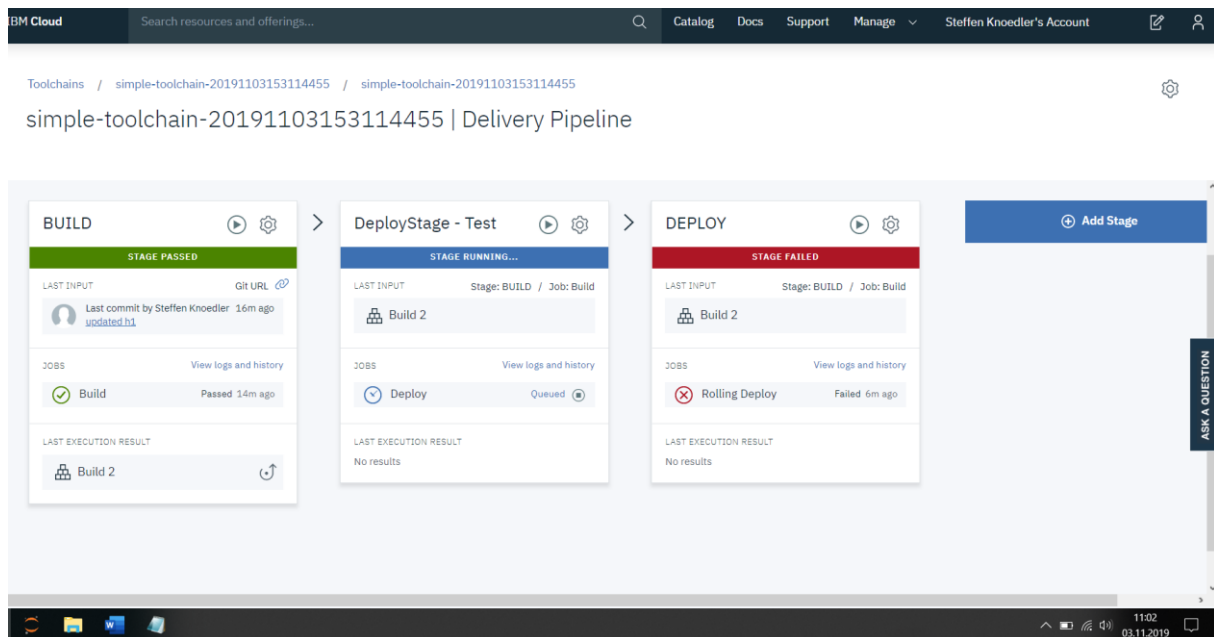
You have exceeded your organization's memory limit: app requested more memory than available

Showing health and status for app simple-toolchain-20191103153114455-OLD-1572796280 in org sknodler@syr.edu / space dev as sknodler@syr.edu...

I went into the html source code of the website and updated the welcome text. I successfully committed and pushed my changed but I could not deploy it because I ran out of memory. Please see error log. This is not my mistake.

- Task 3: Add a stage to the pipeline

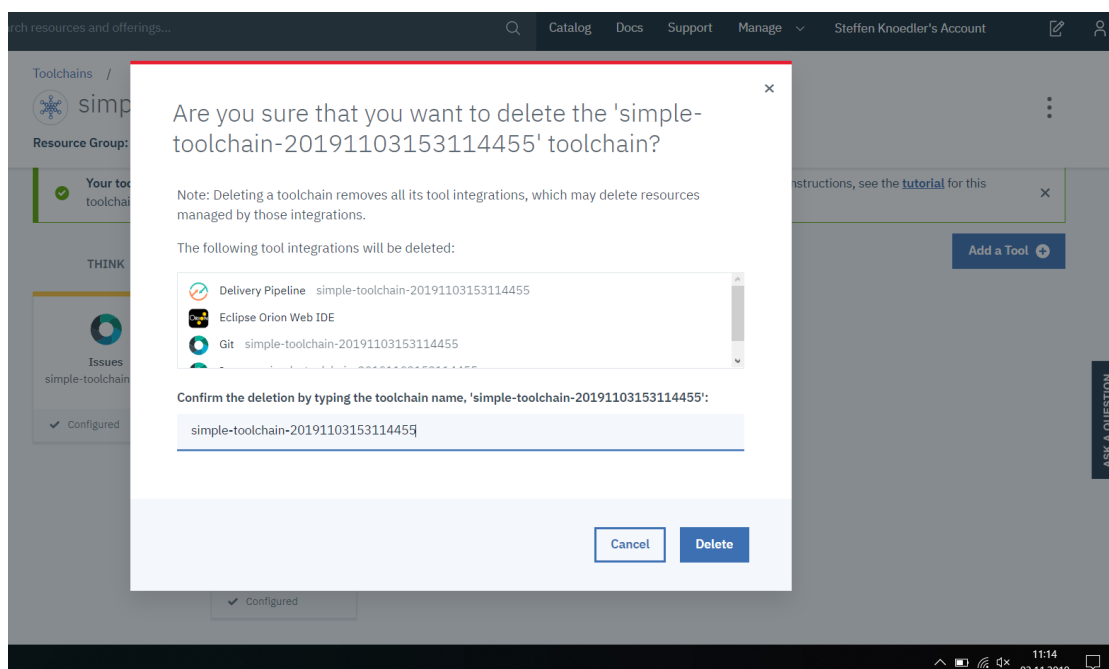
The screenshot shows the IBM Cloud Foundry console interface. At the top, there is a search bar and navigation links for 'Catalog', 'Docs', 'Support', 'Manage', and 'Steffen Knoedler's Account'. The main content area displays the 'Deploy' configuration for a job. The configuration includes fields for 'Deployer type' (Cloud Foundry), 'Pipeline image version' (Inherited from Configure Pipeline (latest)), 'Cloud Foundry Type' (IBM Public Cloud), 'API key' (test234), 'IBM Cloud region' (Dallas - https://api.ng.bluemix.net), and 'Organization' (sknodler@syr.edu). A 'Remove' button is visible next to the 'Deploy' title. On the right side, there is a vertical button labeled 'ASK A QUESTION'. The bottom of the screen shows a taskbar with system icons and the date/time '11:01 03.11.2019'.



The Build stage gets the source code from my repository. It compiles or processes the code to produce the IT artifact for deployment. In the next stage, I can deploy the IT artifact. However, in this task I have added a test deploy stage to see if an employment would succeed. This way I can prevent issues in the production environment.

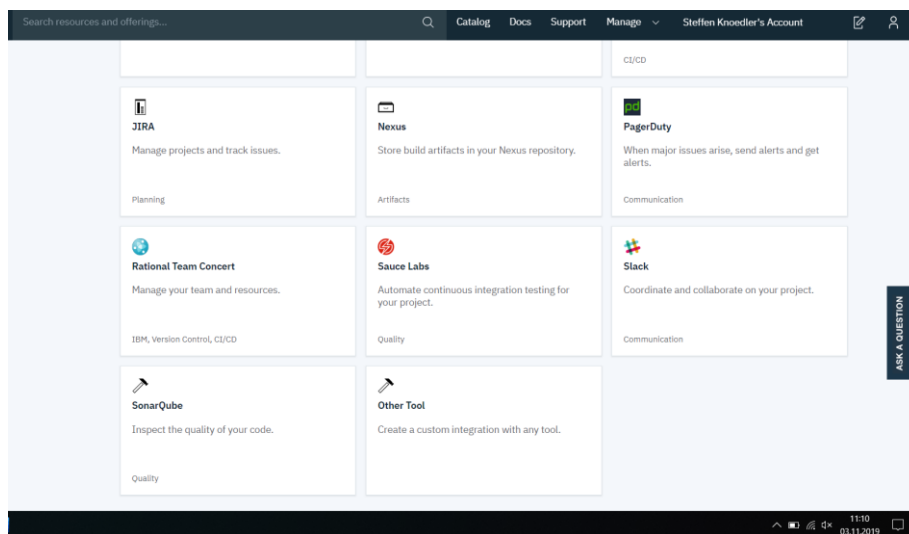
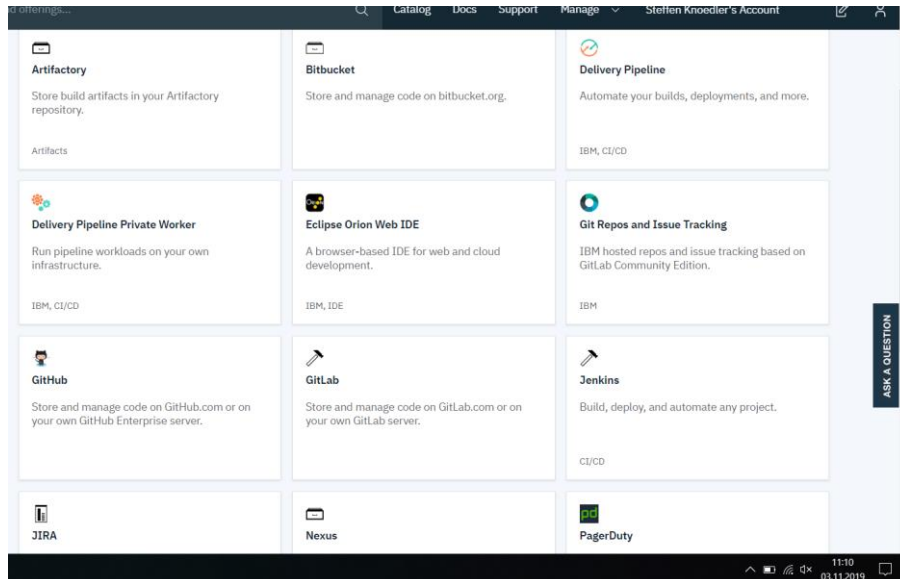
The Deploy stage contains jobs that deploy the artifacts created by the Build stage.

- Task 4: Delete the toolchain (Optional)



## Sub-Module 1.2 - Questions

1. Which tool integrations are available to add and configure for your toolchain?



2. What is Continuous delivery (CD)?

I use an automated pipeline to always have my application ready to be used and still be able to continuously work and update the software.

- a. What is a delivery pipeline?

A delivery pipeline is the sequence of build-test-deploy. The delivery pipelines enables me to easily update and maintain my application whenever needed.

- b. List down at least four benefits of an automated software delivery pipeline.

1. I can integrate automated testing to verify that my software will work in production environment and other parts are also still working when deployed.
2. Automated recovery can be integrated in case something goes wrong



3. I can automatically trigger a test of my software after a successful build. This saves time
4. New team members can begin to work much faster because they do not need to learn complex development and test environments.

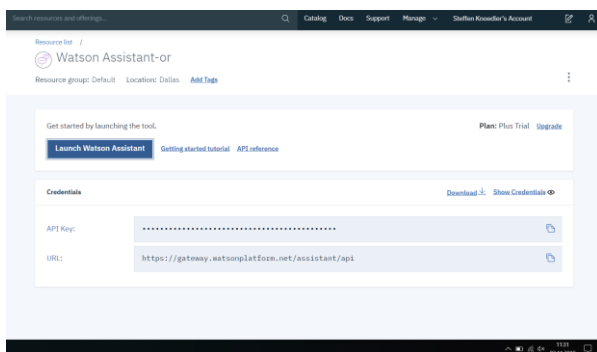
c. What is DevOps and what part does it play in the Method?

DevOps is an approach to agile and lean software delivery that should bring together the different business departments, IT, development and business. It aims to improve software delivery and includes continuous delivery, deployment and monitoring. Therefore, continuous delivery is a part of the DevOps approach.

## MODULE 2 - IBM Watson

### Sub-Module 2.1 - Building a virtual assistant/chatbot

- Go to the tutorial link for creating IBM Watson Assistant  
<https://cloud.ibm.com/docs/services/assistant?topic=assistant-getting-started#getting-started>
  - NOTE: You can create the virtual assistant for any application
- Create a service instance to start
  - Go to the Watson Assistant page in the IBM Cloud™ catalog and Select  
<https://cloud.ibm.com/catalog/services/watson-assistant>
    - Region - Dallas
    - Pricing Plan - Plus Trial
    - Service Name - set by default
    - Resource Group - Default
    - Tags - optional
- Step 1: Open Watson Assistant



- Step 2: Create an assistant
- Step 3: Create a dialog skill

The screenshot shows the IBM Watson Assistant configuration page for an assistant named "My first assistant1". The page is divided into two main sections: "Skills" and "Integrations".

**Skills Section:**

- Dialog:** A table lists the dialog skills. One skill is shown: "Conversational Skill tut".
- Search:** A search bar with a "Plus" icon.

**Integrations Section:**

- Add integration:** A button to add new integrations.
- Preview Link:** A button to preview the assistant's responses.

**Metadata for "Conversational Skill tut":**

LANGUAGE:	TRAINED DATA:	VERSION:	CREATED:	UPDATED:
English (US)	0 Intents   0 Entities   2 Dialog Nodes	Development	Nov 3, 2019 11:34 AM EST	Nov 3, 2019 11:34 AM EST

**Linked Assistants:** My first assistant1

- Step 4: Add intents from a content catalog

The screenshot shows the IBM Watson Assistant interface for the "General" intent catalog. The page title is "General".

**Description:** General conversation topics most users ask.

Intent (10)	Description	Examples
General_Human_or_Bot	Ask if speaking to a human or a bot.	Are you a robot? Are you even real? Are you human? 9 more examples...
General_Jokes	Request a joke.	Do you have a joke? Can you tell me a joke? Can you tell a joke? 14 more examples...
General_Negative_Feedback	Express unfavorable feedback.	It is annoying I hate you I hate this! 17 more examples...
General_Positive_Feedback	Express positive sentiment or gratitude.	You've been so helpful :) You're a genius! You the man 16 more examples...
General_Security_Assurance	Express concerns about the security of the bot.	Are you safe on hackers? Will my conversation remain secured? Why would I trust this chat? 23 more examples...

- Step 5: Build a dialog

11/03/2019

The screenshot displays the Microsoft Bot Framework Designer interface. At the top, there are links for 'Cookie Preferences', a help icon, and a user profile icon. Below this is a search bar and two buttons: 'Save new version' and 'Try it'. The main workspace is divided into three sections: 'Welcome', 'If assistant recognizes', and 'Assistant responds'. The 'Welcome' section shows a 'welcome' trigger. The 'Assistant responds' section shows a 'Text' response with the message 'Hello. My Name is Steffen Knoedler. How can I help you?'. Below the message is a text area for 'Enter response variation'. At the bottom, it states 'Response variations are set to **sequential**. Set to [random](#) | [multiline](#)' and includes a 'Learn more' link. The Windows taskbar at the bottom shows the time as 11:40 on 03.11.2019.

Cookie Preferences ?

Search Save new version Try it

Welcome Customize x

If assistant recognizes

welcome x +

Assistant responds

Text

Hello. My Name is Steffen Knoedler. How can I help you?

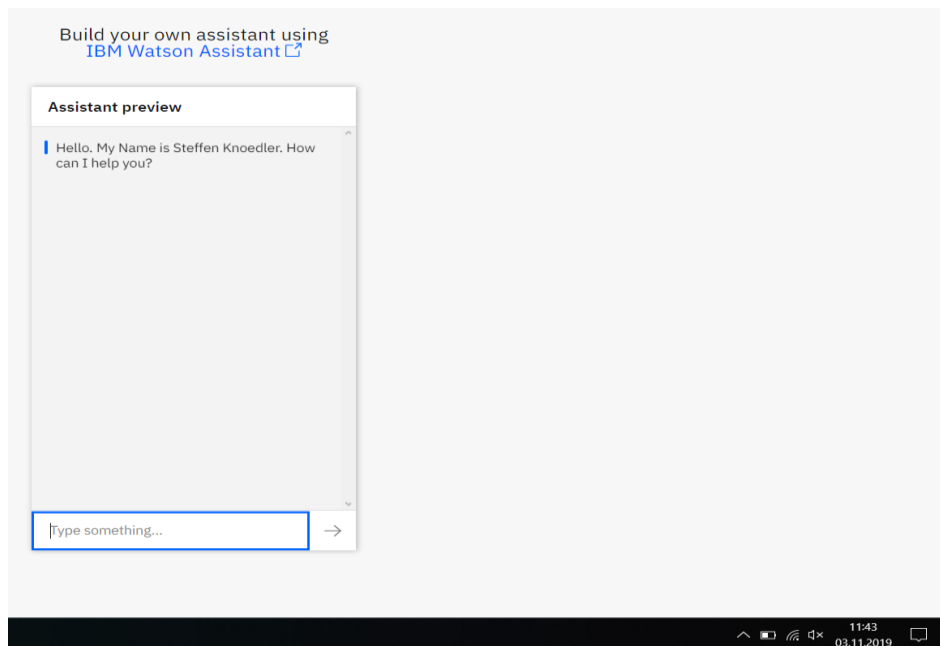
Enter response variation

Response variations are set to **sequential**. Set to [random](#) | [multiline](#)

[Learn more](#)

11:40 03.11.2019

- Step 6: Integrate the assistant



## Sub-Module 2.1 - Questions

### 1. What is an Assistant?

An assistant is a software product that is can conversationally interact with an user

### 2. Define Skills.

#### a. What are the two skill types?

Dialog Skill (skill to enable Watson to have a conversation and interact with the user)

Search Skill (Watson can use the input of the users as search queries and find external data sources)

#### b. Describe the three types of artifacts wrt Dialog skills.

Intents, Entities, and Dialog: Intent is the intent of the users input. Entities represent an object or a term that is relevant to my intents – it provides the context for an intent. There, I can list possible values for each entity that the user might enter. The dialog is the flow that defines the responses to the defined intents and entities.

### 2. What is DevOps and what part does it play in the Method?

DevOps is an approach to agile and lean software delivery that should bring together the different business departments, IT, development and business. It aims to improves software delivery and includes continuous delivery, deployment and monitoring. Watson can help to monitor the software by receiving users feedback.