

# Question Answering and Chatbots

## 0th Practical exercise

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**Hochschule Anhalt**

Anhalt University of Applied Sciences

# Before we start

“An expert is one who knows more and more about less and less until he knows absolutely everything about nothing.” – Nicholas Butler.

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We will make it! // Wir schaffen das!

# Who am I

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- 2020 PhD student and research assistant at FB5, Hochschule Anhalt, Germany.

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Achievements:

- 2018 – 1st prize in the Perm University conference, Russia.
- 2018 – TOP-10 in Machine Learning competition within the “Russian Artificial Intelligence forum”. Moscow, Russia.
- 2019 – TOP-9 in data analysis competition “Data Mining Cup”. Berlin, Germany.
- 2020 – Bronze medal on Kaggle.com “Jigsaw Multilingual Toxic Comment Classification” competition.



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**Main item in my bio:** Participant of QA and Chatbots WiSe 19/20

# Plan for exercises

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- Extra tasks → Benefits in final grade, participation in a publication (e.g. data labelling).
- Projects – main thing in the course.

Any questions before we start?

# Technology stack

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**Programming language:** use any language that you know. But it would be easier with Python.



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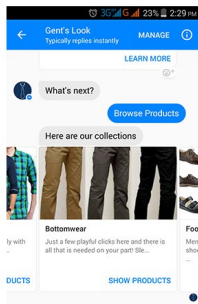
**Technologies:**

- Programming + Web knowledge;
- DBMS + Triplestores (RDF, SPARQL);
- NLP Tools (NLTK, spaCy, Gensim, CoreNLP ...);
- Basic Linux skills;
- Docker;
- Version control and project management;
- ML/DL stack (Pandas, NumPy, Sklearn, Tensorflow ...).

What do you know about application of QA and Chatbots?

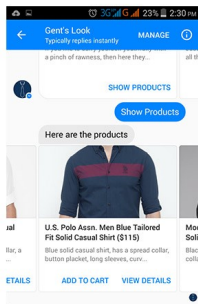
# Usage of QA and Chatbots

## Chatbots for eCommerce



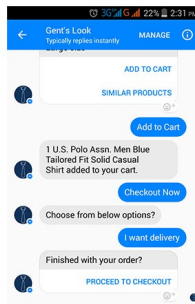
Send a message

Order Now



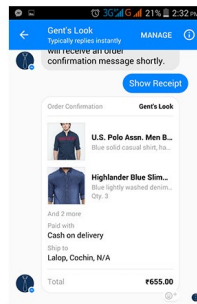
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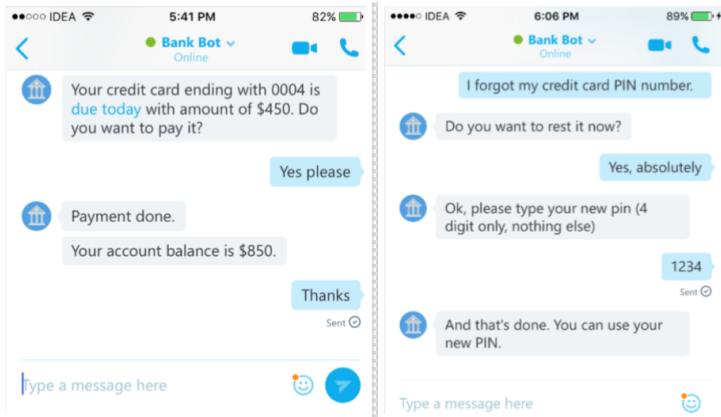
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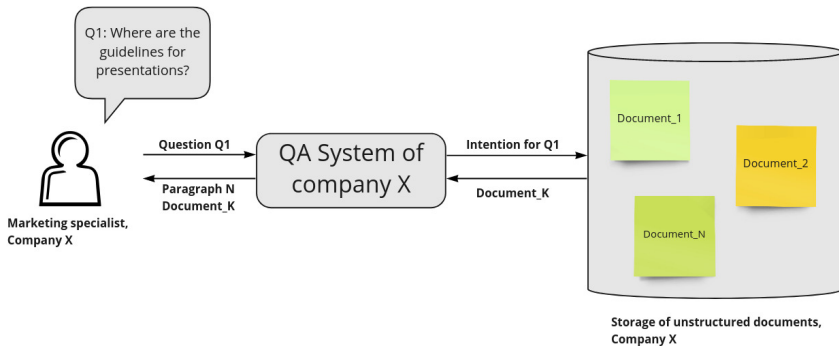
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## Chatbots for Banks



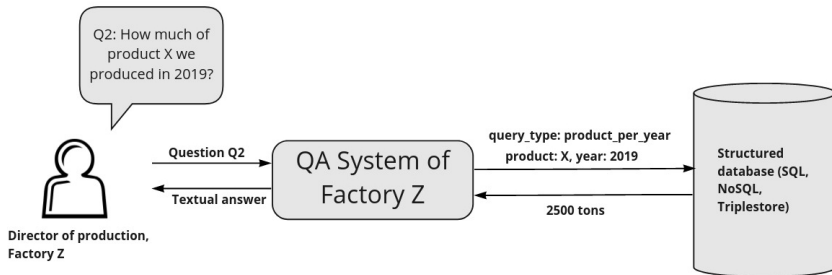
# Usage of QA and Chatbots

## Question Answering: “Reading comprehension”



# Usage of QA and Chatbots

Question Answering: “Database/Knowledge base (-graph) based”



What are the differences between a knowledge base and a knowledge graph?

What are the differences between a knowledge base (-graph) and a database?



# How would you design the ELIZA's algorithm

```
Welcome to

EEEEEE  IL      IIII  ZZZZZZZ  AAAAAA
EE      LL      II    ZZ      AA   AA
EEEEEE  LL      II    ZZZ      AAAAAA
EE      LL      II    ZZ      AA   AA
EEEEEE  LLLLLL  IIII  ZZZZZZZ  AA   AA

Eliza is a mock Rogerian psychotherapist.
The original program was described by Joseph Weizenbaum in 1966.
This implementation by Norbert Landsteiner 2005.

ELIZA: How do you do. Please tell me your problem.
YOU:   Do you really like me?
ELIZA: What makes you think I really like you ?
YOU:   Does that mean you don't really like me?
ELIZA: Really. I don't really like you ?
YOU:   I'm confused. Do you like me or not?
ELIZA: Do you know anyone else who is confused ?
YOU:   Don't change the subject! I need to know if you're my friend!
ELIZA: What would you do if I are your friend ?
YOU:   I would be happy - we could go on picnics!
ELIZA: Can you elaborate on that ?
YOU:   █
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ELIZA reuses part of a sentence of a user.

Define an easy algorithm for a QA system or a Chatbot (draw it or write pseudocode).

### **Key points:**

- First tasks (today) are not required to complete;
- Tasks starting from the 2nd practical exercise are required (will be published to Moodle before the exercise);
- Preparation for the 2nd exercise: SPARQL, DBpedia, Wikidata;
- All the information that is presented on the exercises will be in the lectures.