Course Introduction

What (and how) are we going to learn?

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Course Objectives

Working with data in a disciplined way

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- Learn how to apply the scientific method to
  - Ask the right questions
  - Obtain and clean up data
  - Explore and analyze data
  - Make the correct conclusions
- Write your own research
  - Learn how to create evidence-based, reproducible research
- Learn how to create a complete solution
  - Incorporate best practices in software design and science
- Communicate and compare results with the community

Prerequisites

Programming Basics

- Some familiarity with Python is required
- Software development experience is a plus

Math Concepts

- Know some algebra and statistics (and a little bit of calculus)
- Have basic logic and intuition

Intermediate English

- Understand what is written on the slides

Scientific Mindset

- Be open to (and not afraid of) challenges

Course Format Details

Curriculum, schedule, trainer, lecture format, exam

Curriculum

- Course introduction
- Data acquisition
- Data tidying and cleaning
- Data visualization. Exploratory data analysis
- Case studies, part 1: Images and text
- Case studies, part 2: Spatial data and networks
- Modelling basics: regression models
- Best practices in software and science
- Exam preparation: end-to-end project

Course Schedule

- Lessons
  - 8 lectures x 4 hours each on-site
- Homework
  - 4 hours+ – the more, the better
  - Quiz – 0.25-0.5 hours
    - Questions to check your understanding
  - Lab – 1-6 hours
    - Problems related to real-life data science
- Extracurricular activities: 0+ hours
- Practical exam
  - Preparation at home – 3+ hours
  - On-site defense: 10 minutes

Final Exam

- Practical project
  - Work on your own
    - No teams allowed
  - Present your results (documentation, code, etc.) in a limited amount of time
- Work on a given assignment
  - Assignment release time: at second lecture
  - Perform research
    - Scientific papers, community forums, etc.
  - Analyze the data
  - Write code
  - Communicate the results

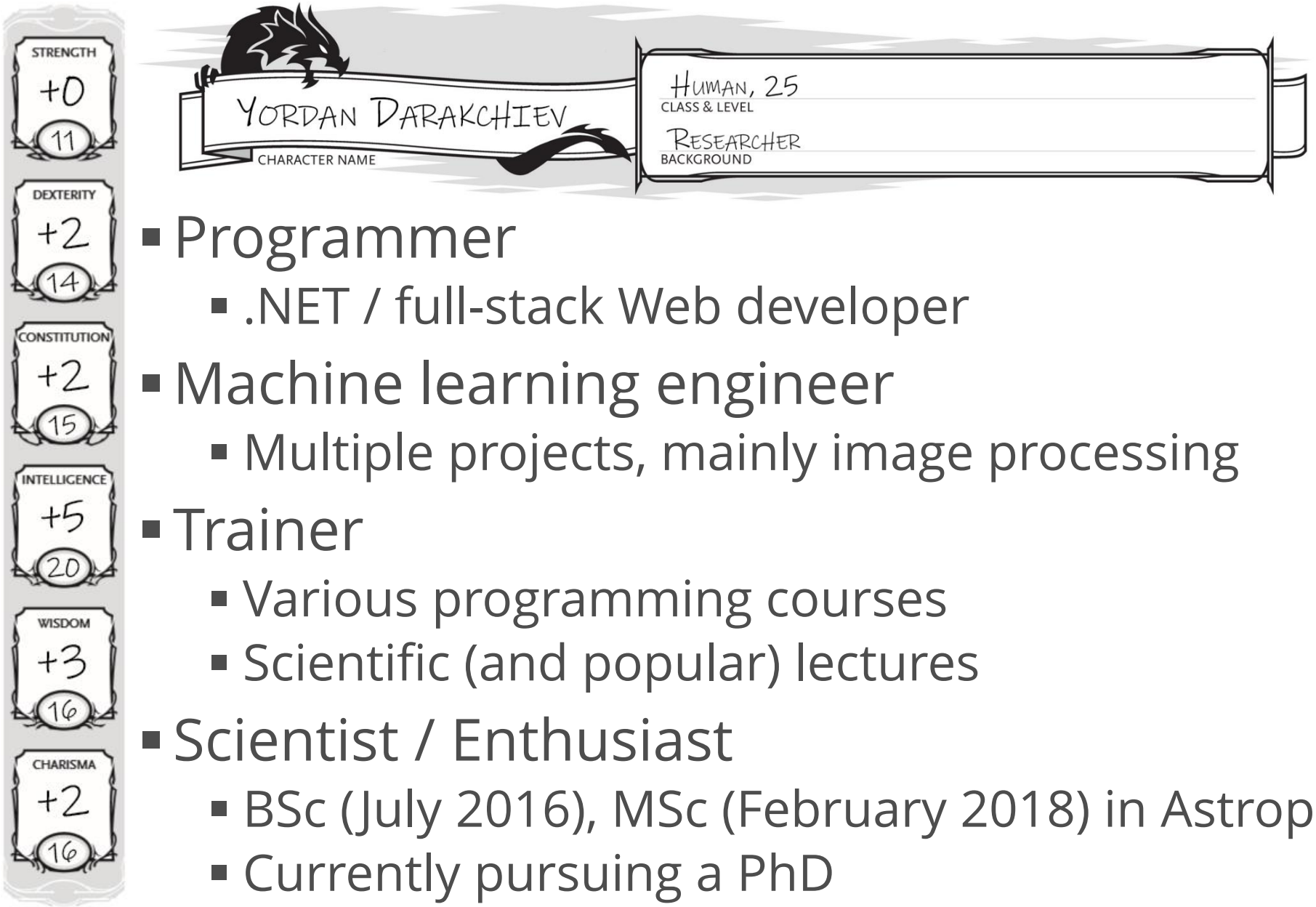
Grading Scheme

- Quizzes: up to 10%
  - Due at the end of the course (29 July 2018, 23:59:59 GMT+3)
  - Most questions: 3 tries per quiz
- Labs: up to 20%
  - Due at the end of the course
- Final exam: up to 70%
  - Develop at your own pace
  - Upload deadline: 27 July 2018, 12:00 GMT+3
  - On-site defense: 29 July 2018, 9:00 GMT+3
  - To qualify: at least 5/30 points from quizzes and labs
- Forum activity: bonus up to 10%

Grading and Course Certificate

- All students will be graded on a scale from 2,00 to 6,00
  - The same way the standard grading in Bulgaria works
- Everyone who scores ≥ 5,00 (total) on the course will get a certificate from SoftUni
  - Starting point for a **new career** or **continuing education** in your current field
  - **Career assistance**
    - The SoftUni career center will help you find work
  - Official and recognizable
    - Employers value certificates
  - Proof of hard work :)
    - Shareable and verifiable

Who Am I?



- Programmer
  - .NET / full-stack Web developer
- Machine learning engineer
  - Multiple projects, mainly image processing
- Trainer
  - Various programming courses
  - Scientific (and popular) lectures
- Scientist / Enthusiast
  - BSc (July 2016), MSc (February 2018) in Astrophysics
  - Currently pursuing a PhD

Learning Resources

Learn more
and share your knowledge

SoftUni Course Pages

- AI module
  - https://softuni.bg/modules/65/artificial-intelligence-april-2019
- Official Web page of this course
  - https://softuni.bg/trainings/2315/data-science-june-2019
- Forum category
  - https://softuni.bg/forum/categories/96/data-science
  - Ask and answer questions
    - I will try to answer your questions as well
  - Post what you've learned
    - Links to resources, code snippets, ideas, tips and tricks
  - Share your problems (homework or not) and help solve them
  - Create and maintain a community
    - A **critical part** of doing science

Online Resources

- Books
  - "How not to be wrong" – Jordan Ellenberg
  - "Learning Data Mining with Python" – Robert Layton
  - … and anything else you can find
- Websites
  - Khan Academy
  - Communities: Kaggle, Quora, Stack Exchange
  - Online courses: Coursera, edX, MIT OCW, Stanford, etc.
- YouTube
  - FunFunFunction, Daniel Shiffman, Siraj Raval, AsapSCIENCE, Veritasium, Vsauce, TedEd, CrashCourse, Mind Your Decisions, Infinite Series, Numberphile, Computerphile, Vi Hart, 3Blue1Brown, blackpenredpen, Mathologer, and many more

Questions?