Proposal of deep learning training using " ModuCoding "

모두의 코딩

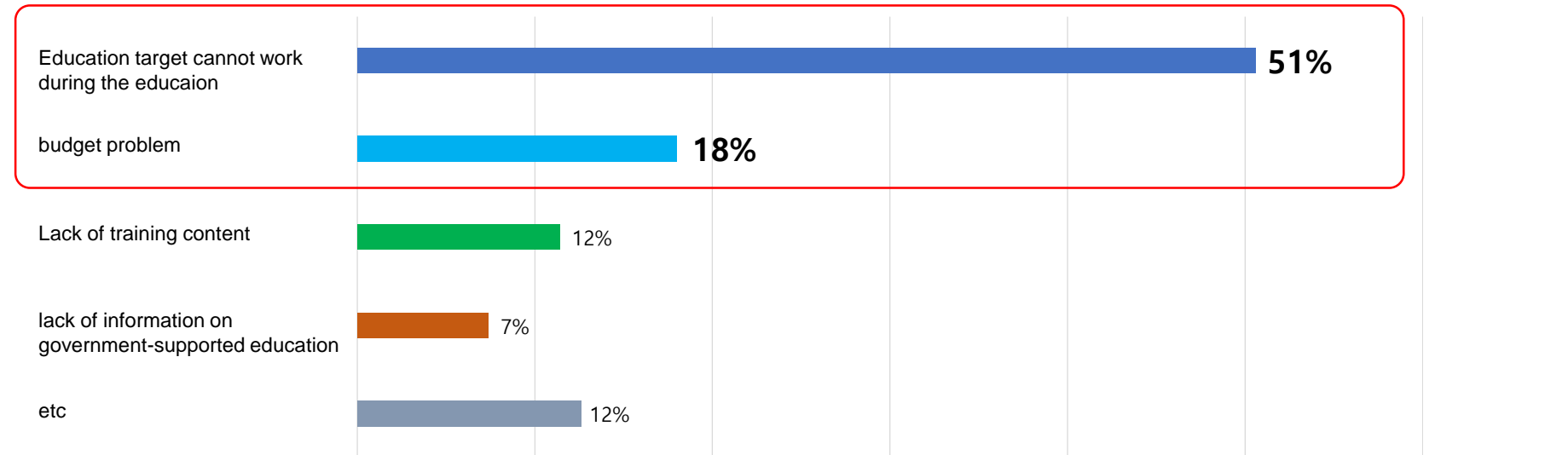MENTOREET Sung Jae Kang / sjkang@mentoreet.com / +82- 010-5299-4925

1. Proposals Overview – Difficulty in SW re-education

Necessity of re-education in SW

Reinforcing the latest technology capabilities through training in the field of technology, the gap between business operations and technology development among the incumbent is narrowed.
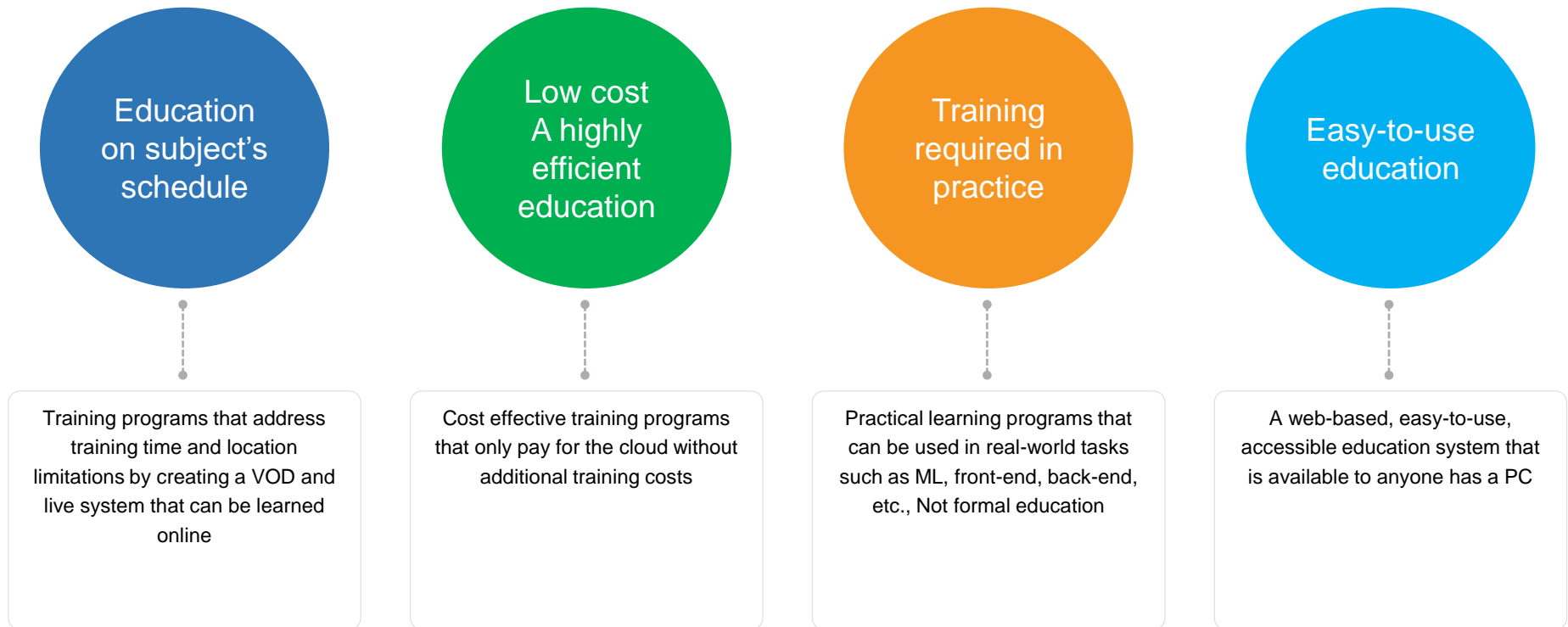Increase the likelihood of commercialization in the field.

Difficulty in re-educating SW employees

Category	Percentage
Education target cannot work during the educaion	51%
budget problem	18%
Lack of training content	12%
lack of information on government-supported education	7%
etc	12%

SW re-training is necessary, but the biggest problem is the lack of work due to time and space constraints.

1. Proposals Overview – Training through Coding of Everyone

Solving constraints on typical retraining

Education on subject's schedule	Low cost A highly efficient education	Training required in practice	Easy-to-use education
Training programs that address training time and location limitations by creating a VOD and live system that can be learned online	Cost effective training programs that only pay for the cloud without additional training costs	Practical learning programs that can be used in real-world tasks such as ML, front-end, back-end, etc., Not formal education	A web-based, easy-to-use, accessible education system that is available to anyone has a PC

Realistic and efficient SW re-training is possible in 모두의 코딩

2. Overseas coding education trend

Worldwide, we are fostering talent from elementary to adults through coding education, especially Ecole42 in France is a good example of fostering talent through IT.

Ecole42 French School of IT Technology without Instructors, Textbooks, and tuition fees

A shift to education that provides knowledge and access to solving problems

1. Age 18~30, the only requierement

2. School /performance No need

3. Background irrespective of race, experience, and comparative activity

4. Performance -based After passing the online logical test, the four-week course of study (Piscine)

5. Campus Paris, France, Silicon Valley

6. Typical Procedures

Online Test (logic test) :
- Logic and memory tests, 2.5 hours of testing, and should be performed alone.
- Every year, 20,000 out of 70,000 people complete the test and 30,000 of them will be selected.

Stay and study(Piscine) :
- Coding tasks are given every day, and finding the Internet with a colleague is a task to do.
- There are 24 questions for five days and 17 of them must be solved.
- Week 4 BSQ course, working in pairs for a long task
- Mutual assessment, coding challenge zeroes even for a small error

Ecole42 is

Year of establishment 2013
Founder Javier Niel Free Mobile Chairman
Coding of training subjects (computer programming)
Training IT talent to be put into action immediately
Charateristic No professor, text book and tuition fee
Anyone aged 18 to 30 can apply for admission.
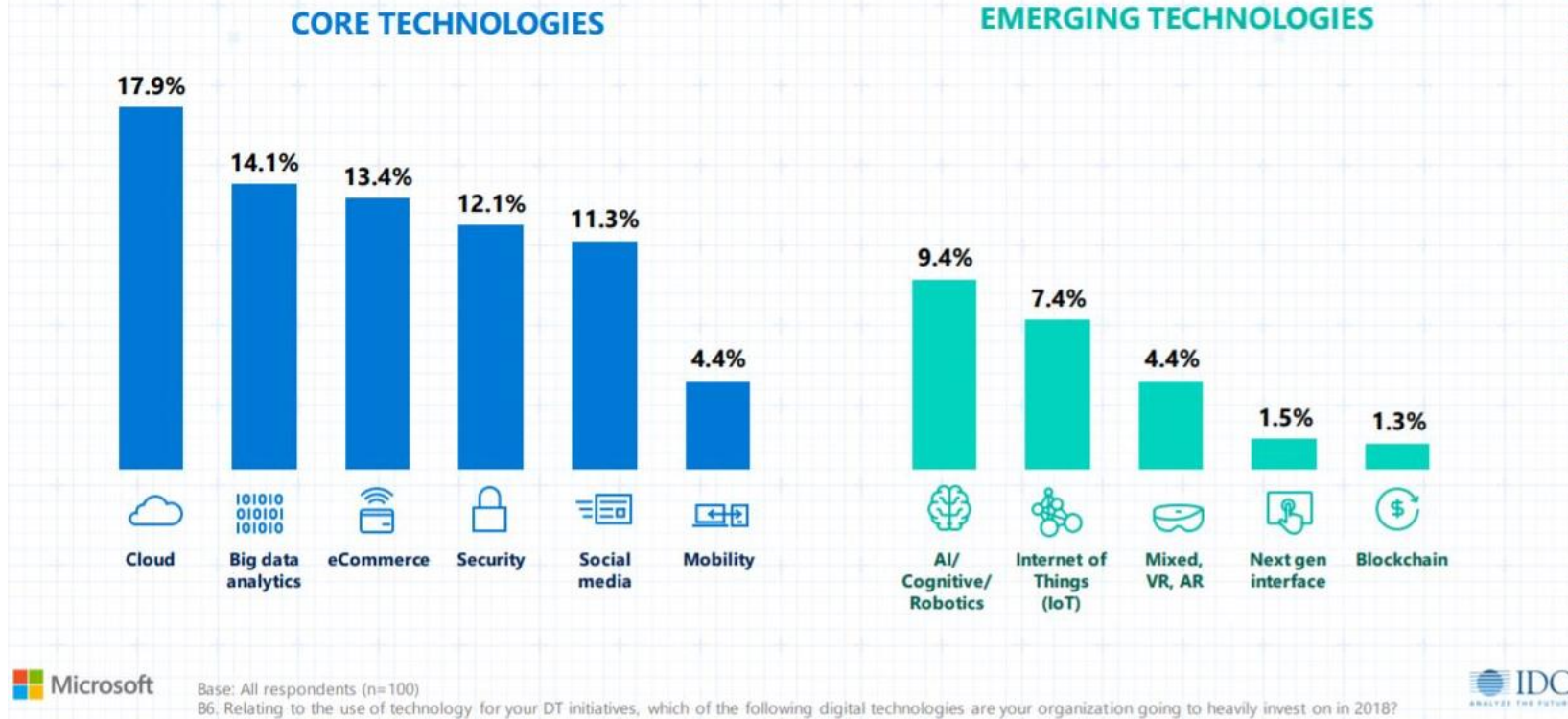The competition rate for admission is about 50 to 1.
100% employment rate
150 school startups
About 100 students a year
60 students' nationalities

3. Digital Transformations Trend


Technology investments for Digital Transformation for 2018

CORE TECHNOLOGIES

- Cloud — 17.9%
- Big data analytics — 14.1%
- eCommerce — 13.4%
- Security — 12.1%
- Social media — 11.3%
- Mobility — 4.4%

EMERGING TECHNOLOGIES

- AI/ Cognitive/ Robotics — 9.4%
- Internet of Things (IoT) — 7.4%
- Mixed, VR, AR — 4.4%
- Next gen interface — 1.5%
- Blockchain — 1.3%

Microsoft

Base: All respondents (n=100)
B6. Relating to the use of technology for your DT initiatives, which of the following digital technologies are your organization going to heavily invest on in 2018?

IDC
ANALYZE THE FUTURE

Digital Transformations Leader Companies Leverage AI based on Data

3. Essential requirements for Digital Transformations

To be successful in your digital transformation...

1. Establish a business strategy based on data

2. Gain Insight from Data with Data Science

3. Train AI with refined data and use it for future predictions

Establish a business strategy

Data Science

AI
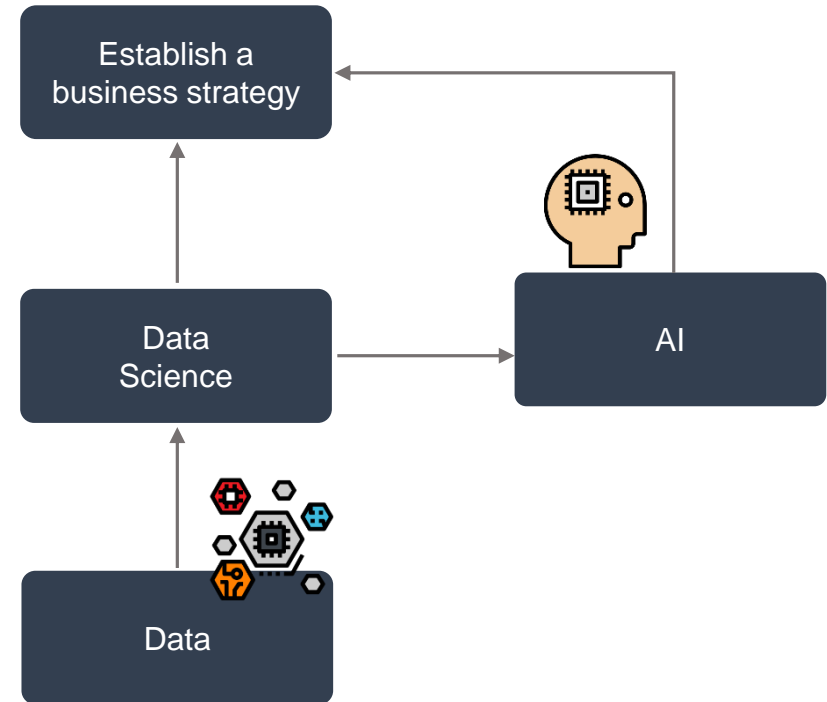
Data

Basic training needs for data science and AI to all members of the organization

4. Data scientist

Data Scientist: The Sexiest Job of the 21st Century

by **Thomas H. Davenport** and **D.J. Patil**

FROM THE OCTOBER 2012 ISSUE

Harvard Business Review

GETTING CONTROL OF **BIG DATA**

Top 5 Jobs in the U.S. in 2018.

Job	1st : Data Scientist	2nd : Developer	3rd : Marketing Manager	4th : Therafist	5th : HRD Manager
Score	4.8	4.6	4.6	4.5	4.5
Satisfaction	4.2	4.0	4.0	4.0	3.9
Hiring Count	4,524	3,369	6,439	11,903	4,458
Average Salary	$ 110,000	$ 105,000	$ 105,000	$ 74,000	$ 85,000

자료원 : Glassdoor
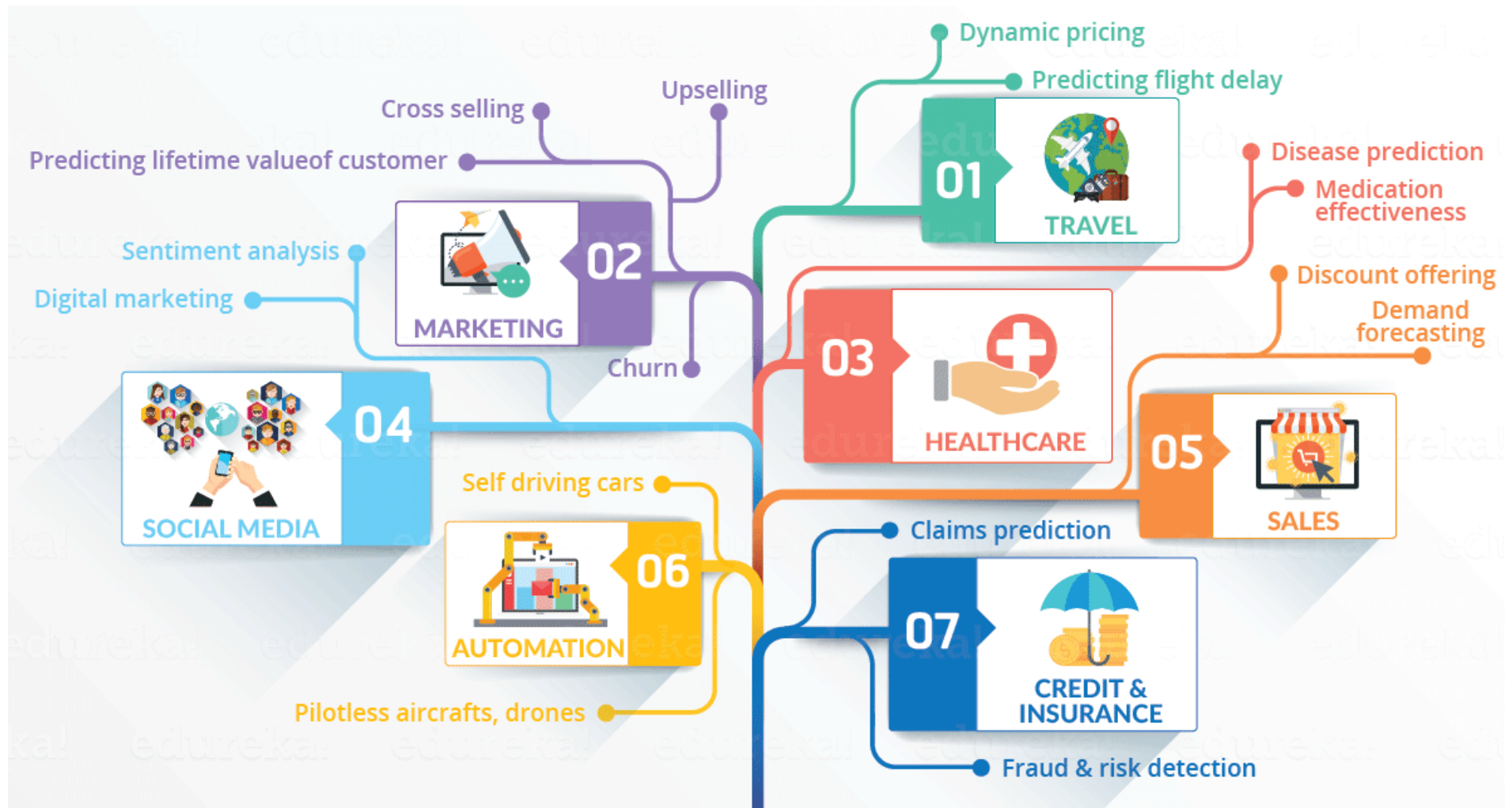
Convergence of Computer Science and Statistics

Computer Science **Data Science** **Statistics**
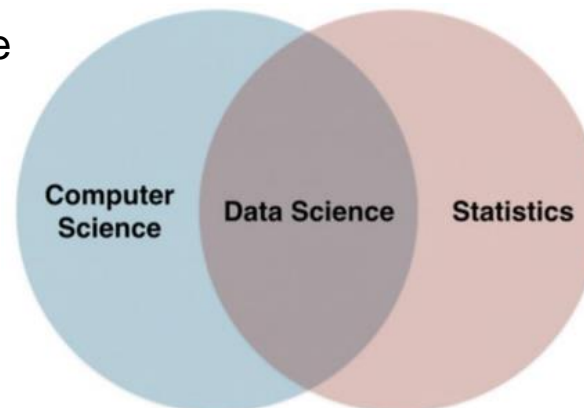
Modeling - Statistics, Machine Learning
Experiments - Statistics
Coding - Computer Science
Quantitative problem solving - Math, Physics, Applied Math
Dealing with large datasets - Experimental physics, Astronomy, Bioinformatics, etc.
Using data to understand people - Social science (with strong mathematical / computational bent) including Economics, Psychology, Political Science, etc.

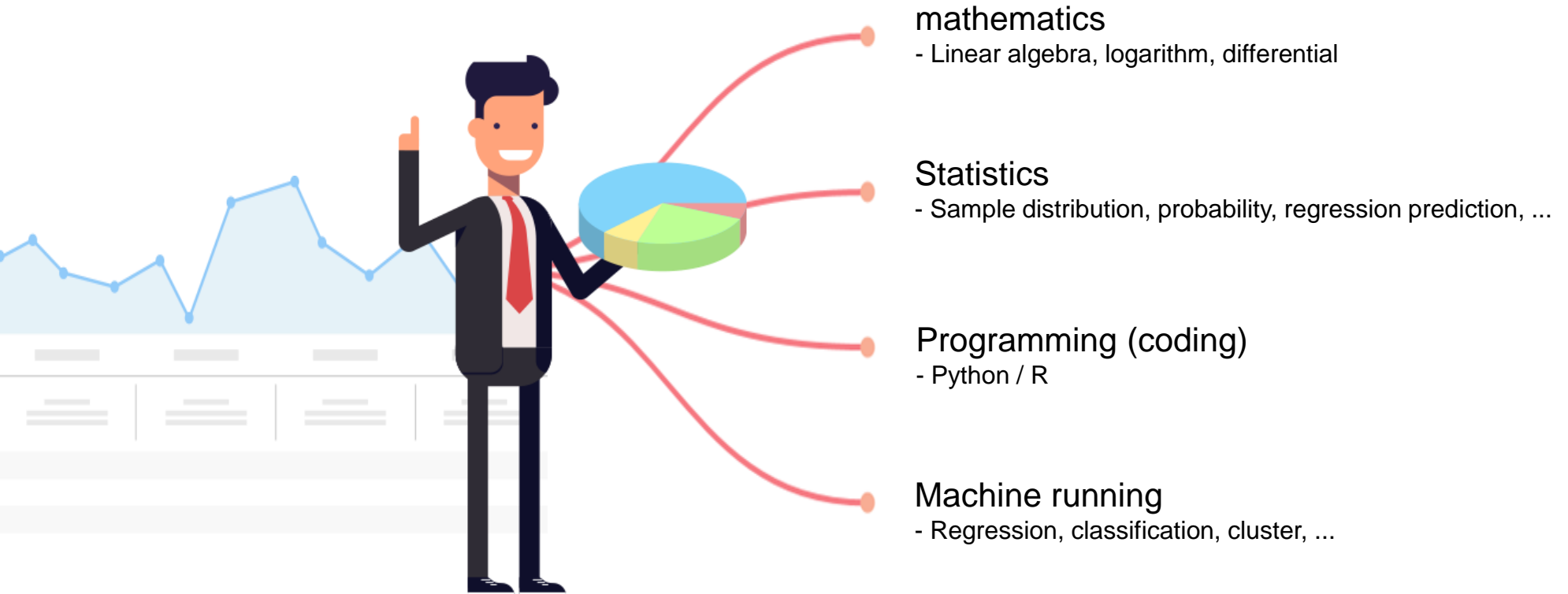https://www.quora.com/What-classes-should-I-take-if-I-want-to-become-a-data-scientist
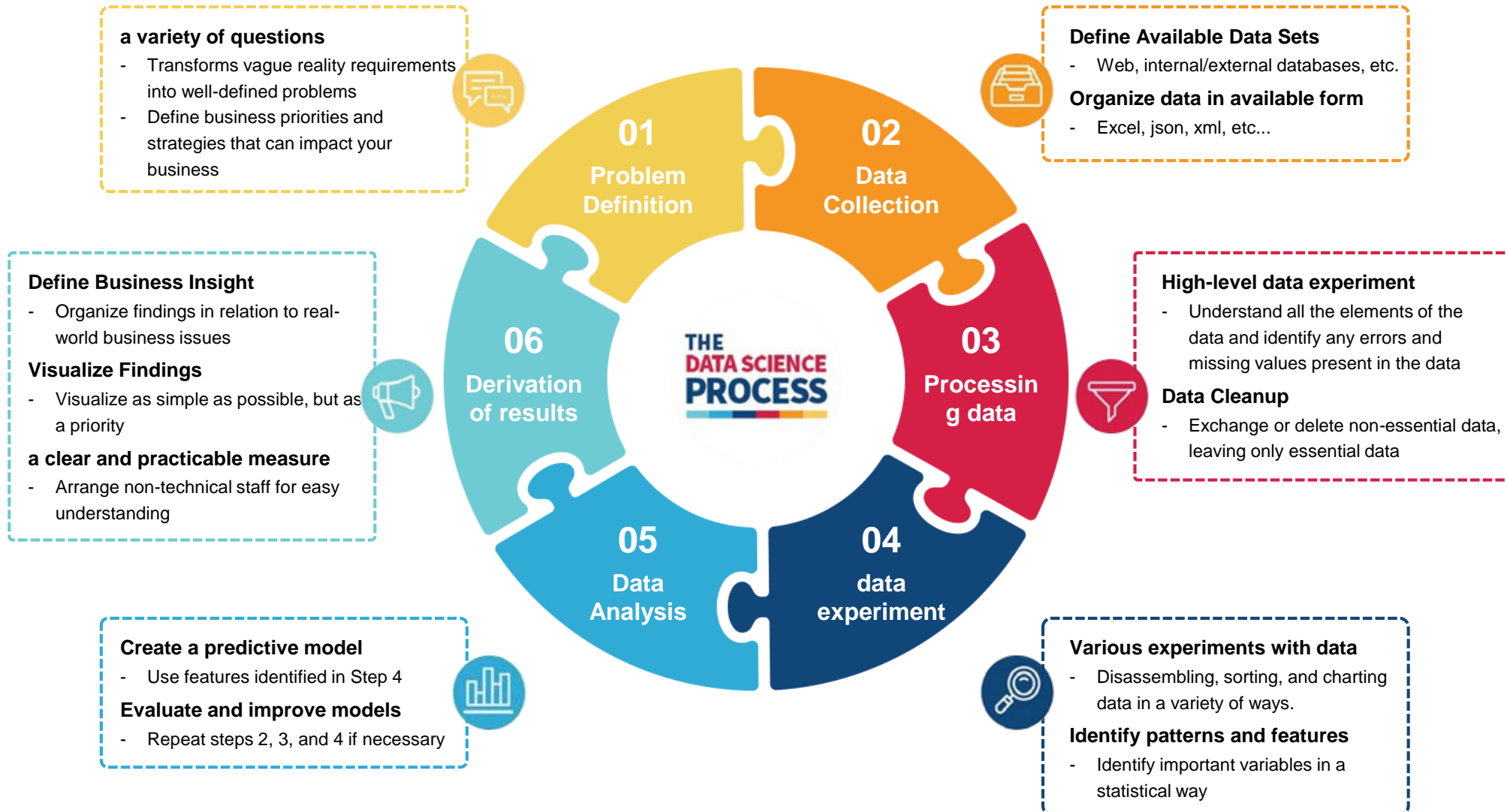
4. Data science case

4. Four key competencies for data scientists

mathematics
- Linear algebra, logarithm, differential

Statistics
- Sample distribution, probability, regression prediction, ...

Programming (coding)
- Python / R

Machine running
- Regression, classification, cluster, ...

4. Key Tasks of Data Scientists

a variety of questions
- Transforms vague reality requirements into well-defined problems
- Define business priorities and strategies that can impact your business

Define Available Data Sets
- Web, internal/external databases, etc.

Organize data in available form
- Excel, json, xml, etc...

Define Business Insight
- Organize findings in relation to real-world business issues

Visualize Findings
- Visualize as simple as possible, but as a priority

a clear and practicable measure
- Arrange non-technical staff for easy understanding

High-level data experiment
- Understand all the elements of the data and identify any errors and missing values present in the data

Data Cleanup
- Exchange or delete non-essential data, leaving only essential data

01 Problem Definition

02 Data Collection

06 Derivation of results

THE DATA SCIENCE PROCESS

03 Processing data

05 Data Analysis

04 data experiment

Create a predictive model
- Use features identified in Step 4

Evaluate and improve models
- Repeat steps 2, 3, and 4 if necessary

Various experiments with data
- Disassembling, sorting, and charting data in a variety of ways.

Identify patterns and features
- Identify important variables in a statistical way

5. Introduction to ModuCoding training course

Course Introduction

Python programming		A course for beginners who have no programming skills to learn Python languages and algorithms to train people with basic programming skills.
data science		Practical courses to learn the fundamentals of data science and to implement data science in Python language.
Deep Learning through Tensorflow		Process for learning machine learning and deep learning using Google's Deep Learning framework, Tensorflow, and Python language

5. Introduction to ModuCoding training course

Python programming

1 Programming basics
. History and structure of computer
  What is coding?
. Concepts and procedures of programming
. Analysis and expression of data and
  information
. Troubleshooting, programming, and
  computing systems
. Learning prompts
  (Everyone's coding systems guided)

2 Learn Python Basics
. What is Python?
. Compare to the type of programming
  language
. Python Basic Operation, I/O
. Apply concepts to practice

3 variable
. Concepts of variables, how to create
. learn programs which are using variables
. Character types available for variables
. Apply concepts to practice

4 Data & String
. To check the data type:
. Associate String with Operator
. To determine string length,
  Explore String methods
. Apply concepts to practice

5 Numeric type and operator
. To change the data type:
. Basic operators, understanding arithmetic
  operators
. Basic operations, math priorities, and other
. Apply concepts to practice

6 logic, relationship operator
. Understanding Logical Operators
. Understanding relational and comparative
  operators
. Apply concepts to practice

7 a conditional sentence
. Understanding the conditional sentence
. Use and apply, create conditional
  expressions using if
. Using comparison operators
. Apply concepts to practice

8 iterations
. Understanding iterations
. using for, while, and range
. Escape from iterations
. Apply concepts to practice

9 multiple iterations
. Understanding the concept of multiple
  iterations/input&outputs
. Overlapping for/while, using multiple if
  statements
. Overlapping and Variable Repetitions
. Apply concepts to practice

10 Array
. Understanding Array and Index
. Adding, cropping, and modifying lists
. Get/ Find the desired item from the list
. Apply concepts to practice

5. Introduction to ModuCoding training course

Python programming

11   a two-dimensional array

. Understanding two-dimensional arrays,
  matrices, and tuples
. Sort list, tour
. Apply concepts to practice

14   Exception handling

. Understanding the concepts of error and
  exception handling
. How to Use Exceptions
. Apply concepts to free practice

12   Basic function

. Understanding Functions
. Using Function call and return
. Using custom variables
. Apply concepts to practice

15   Class①

. Taste object orientation
. Understanding the concepts of attributes
  and methods definition of the
. class and Creating instances
. Apply concepts to practice

13   Use various functions

. Understanding the Acquisition
. Utilising Arguments in a Function
. See examples where arguments are used
. Apply concepts to practice

5. Introduction to ModuCoding training course

Data science

1강 Python for data science
. Python Default Syntax
. Python List
. Function, Package
. NumPy

2강 Python for data science(2)
. Matplotlib
. Dictionary & Pandas
. Repetitive & Logical Control

3강 Python for data science(3)
. lambda function, error handling
. Repeaters, list operations
. List operation
. Practice what you have learned so far

4강 Retrieve data (1)
. Handling simple text files
. Handling other file types

5강 Retrieve data(2)
. Importing data from the Internet
Json type
. Using the Web API

6강 data purification
. Explore Data
. Clean up data for analysis
. Combining data
. Refine data

7강 Pandas basics
. Data Collection and Investigation
. Exploration data analysis
Time series
. Case analysis

8강 Using DataFrame with Pandas
. Extracting and converting data
. Advanced indexing
. Redorting and formulating data
. Grouping data

9강 Merge DataFrame with Pandas
. Data Preparation
. data aggregation
. Merge Data
. Case analysis

10강 Data visualization
. Custom Markings
. Marking a two-dimensional array
. Statistical marking with Seaborn
. Image and Time Series Analysis

5. Introduction to ModuCoding training course

Data science

11   statistical thinking

. Graphical Investigating Data Analysis
. Qunatitive Investigating Data Analysis
. Probabilistic Accident – Discrete Variables
. Probabilistic Accident –
 Continuous Variables

12   Statistical Thinking (2)

. Optimized with parameter prediction
. Hypothesis Verification
. Case analysis
. Apply concepts to practice

5. Introduction to ModuCoding training course

Deep Learning through Tensorflow

1   a general outline

. Organizing and comparing machine learning
  and deep learning concepts
. Cost function, sloping algorithm theory and
  implementation
. Tensorflow default usage

2   Regression

. Cost function and slope down algorithm implemented
  with Tensorflow
. Linear regression
. polynomial regression

3   Classification

. Preprocess Data
. Logistic Classification
. Softmax, Cross-Entropy
. IRIS DATA SETTLE

4   CNN

. Stochastic Slope Down Algorithm
. Image classification using MNIST data set
. Convolution Neural Network Theory and
  Implementation
. Practice CNN Validation with Leaf Datasets

6. Introduce ModuCoding platform

Google Deep Learning Framework Tensorflow

- Used to implement deep learning and machine learning that the computer learns on its own
- Compatibility is high with support for most environments, including Windows, Mac, Linux, and Android
- Available in Python language, accessible to everyone
- Most commonly used in the world, virtually established as the standard for deep learning

Deep Learning Framework Power Scores 2018
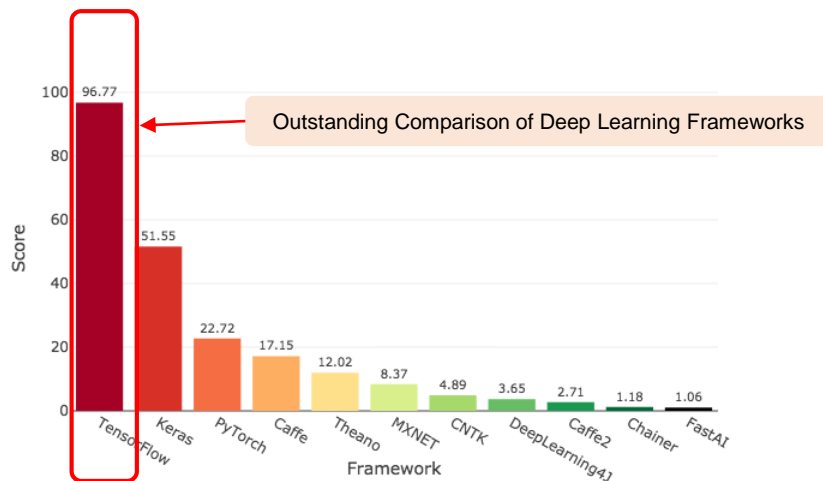
Learn how your computer wins games on its own using Tensorflow
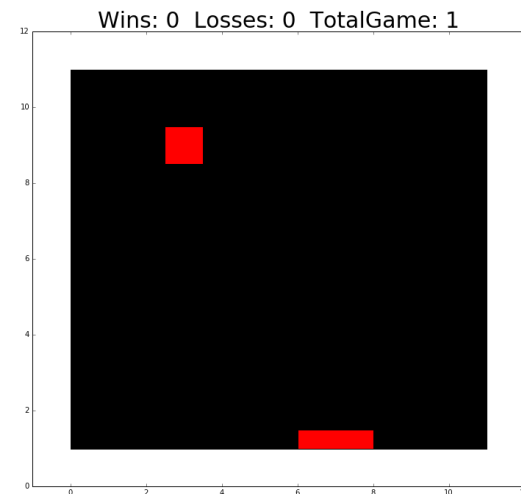
towarddatascience.com

Effective Data Science Learning Through "ModuCoding"

- Provides web-based data science learning / hands-on experience without complex lab configurations
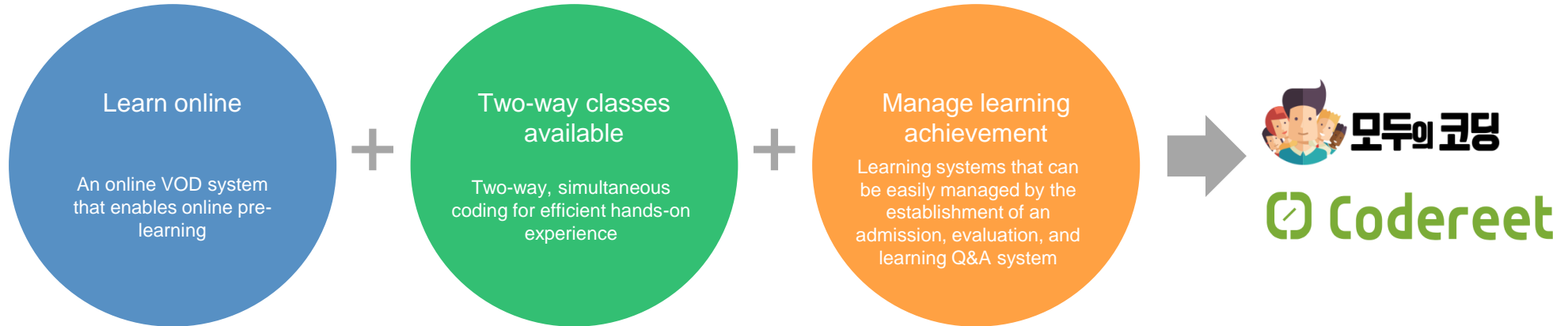- Tensorflow (Python) based AI curriculum and online coding practice environment
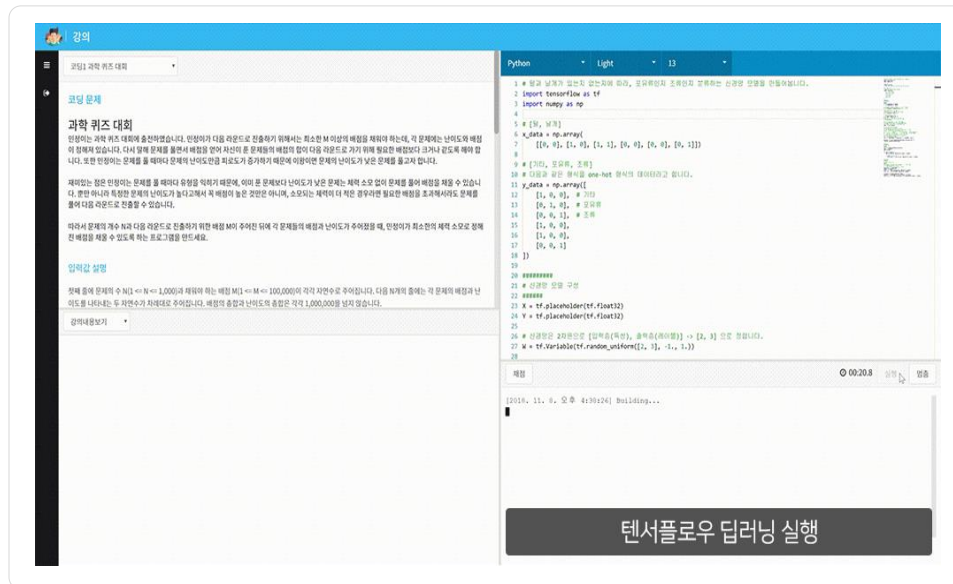
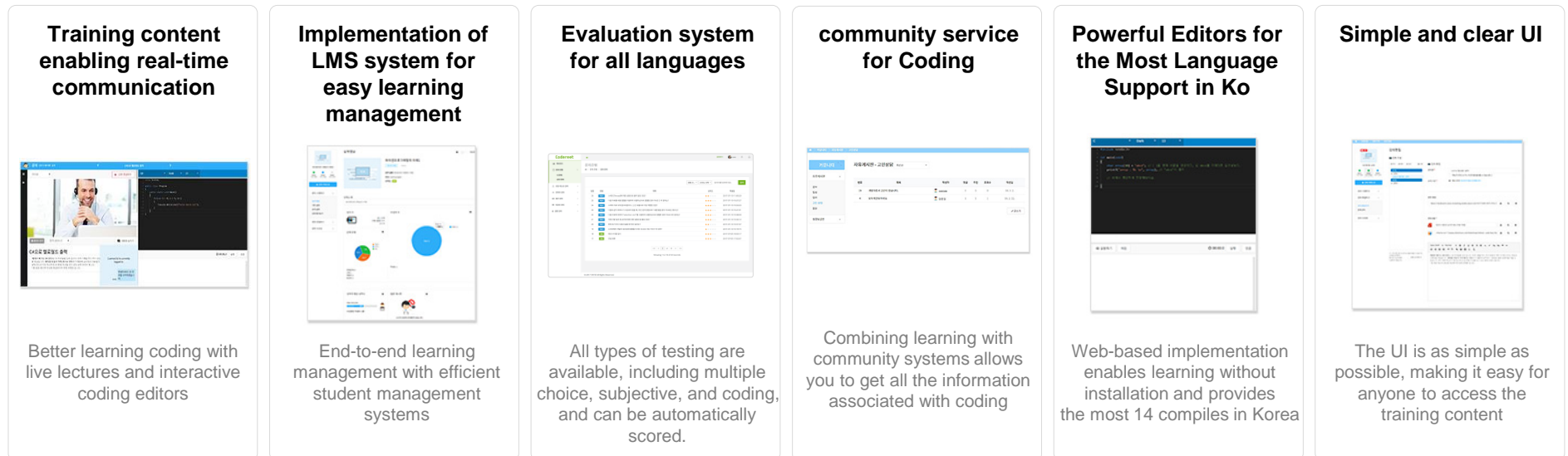
Running Tensorflow deep learning
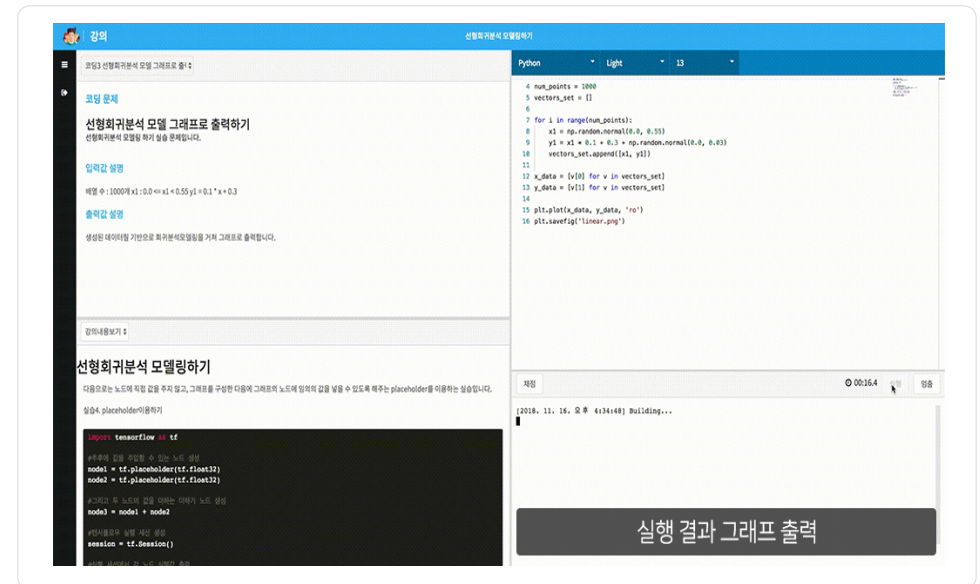
Visualize data on graph

6. Introduce ModuCoding platform

A solution that maximizes learning efficiency
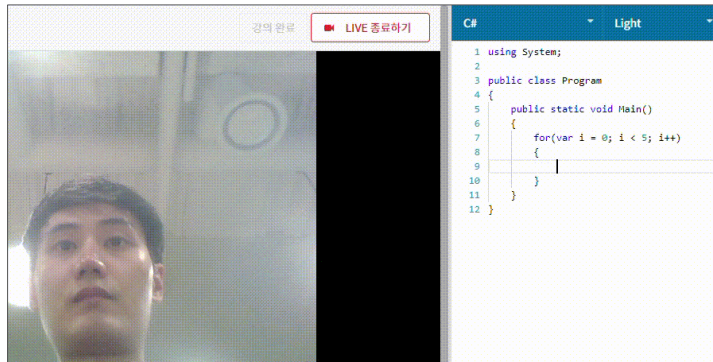
Learn online

An online VOD system that enables online pre-learning

+

Two-way classes available

Two-way, simultaneous coding for efficient hands-on experience

+

Manage learning achievement

Learning systems that can be easily managed by the establishment of an admission, evaluation, and learning Q&A system

모두의 코딩

Codereet

Specialized training systems

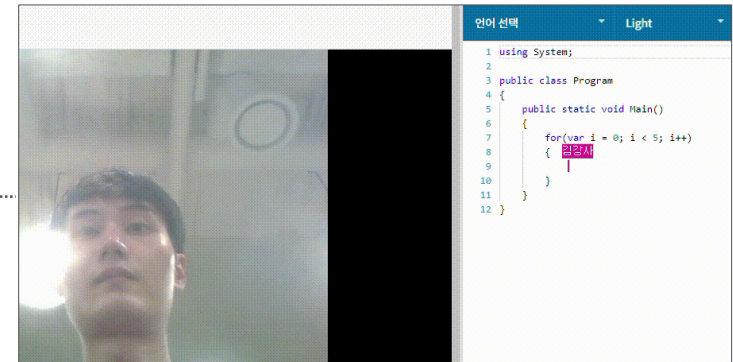| **Training content enabling real-time communication**	**Implementation of LMS system for easy learning management**	**Evaluation system for all languages**	**community service for Coding**	**Powerful Editors for the Most Language Support in Ko**	**Simple and clear UI**
Better learning coding with live lectures and interactive coding editors	End-to-end learning management with efficient student management systems	All types of testing are available, including multiple choice, subjective, and coding, and can be automatically scored.	Combining learning with community systems allows you to get all the information associated with coding	Web-based implementation enables learning without installation and provides the most 14 compiles in Korea	The UI is as simple as possible, making it easy for anyone to access the training content

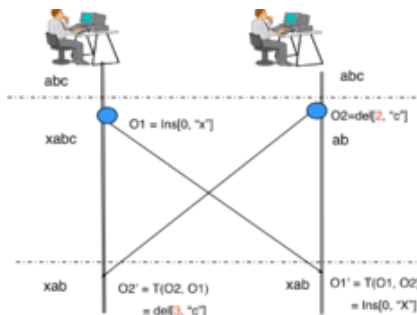# 6. Introduce ModuCoding platform

Instructor

Students

Instructors can conduct live coding training online in real time.

Code synchronization based on Operational Transformation Technology
Up to 20 people can take live coding classes at the same time
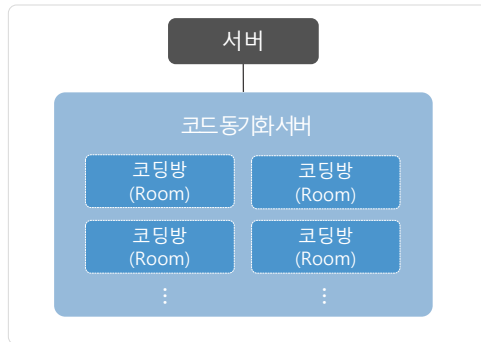
Real-time image transfer based on WebRTC
Web standard image transfer technology enables real-time video transfer with only a web browser without the need for a separate plug-in.
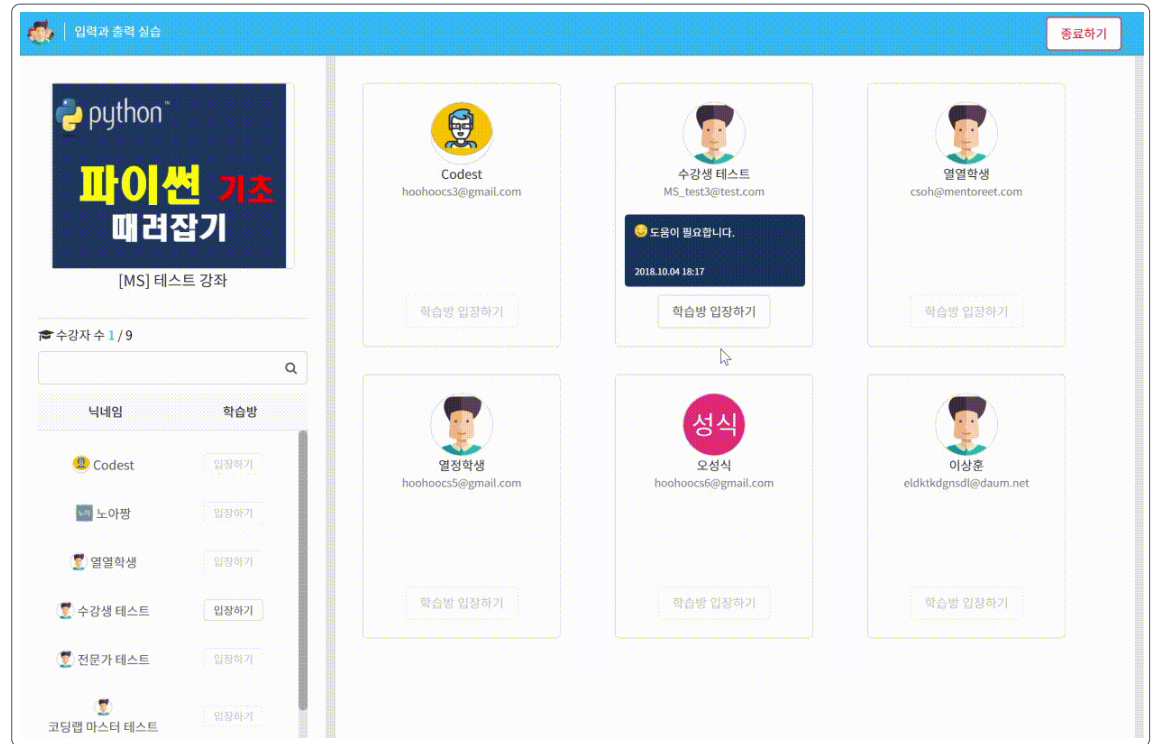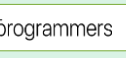
6. Introduce ModuCoding platform– 1:N Online Coaching

Students to ask for help during the exercise

Trainer(s) to enter student's coding room

6. Introduce Moduoding platform

	Domestic Solutions						Overseas Solutions		
	모두의코딩	goorm	oncoder	/*elice*/	programmers	BAEKJOON	HackerRank	codility	paiza
Various languages (minimum 10+ general purpose development languages)	O	O	X	N/A	△	O	O	O	△
User Engagement Problem Bank	O	△	△	N/A	△	O	△	△	X
Playback Playback (Recording All Coding Contents)	O	O	O	O	X	X	△	X	X
Real-time video & chat	O	X	X	O	X	X	O	O	X
Real-time collaboration coding and powerful IDE	O	△	X	△	X	X	△	△	X
GoodSoftware Certification Grade 1	O	X	X	X	X	X	N/A	N/A	N/A
comparative advantages and disadvantages	High speed Powerful analyze and manage results	Slow speed Lack of bi-directional collaboration capabilities	No updates An old editor	Lack of training features	No results analysis after test	Optimized for problem solving	An old editor Playback not found	Management function not found Playback not found	Low technical competitiveness

7. Company introduction

Mentoreet

"We will lead the coding education culture that anyone can share and learn by setting standards for coding and leading the popularization of coding in Korea! "

History

2016.11	Founding Mentorit
12	Anyang University's Leading University MOU
2017.07	Codelet Open
09	Selected as POSCO Investment IMP 14
10	SBA Acquisition Program in Seoul
10	Midas IT Tested New Employee in 2018.
10	Fast Campus Corporate-Specific Training Partnerships
10	Selected Creative Economy Town Incubating Ideas (Codelet)
12	Seoul SBA Investment
2018.02	POSCO Technology Investment
03	Korea Information and Communication Competence Development
04	Institute's Coding Qualification Business Agreement (MOU)
06	List of Prime Ministers of Science and Technology Day 2018
06	Selection of recommended works for codelet new SW products
07	ModuCoding GS First Class Certification
	ModuCoding Beta Services Open

Codereet

Online coding test/interview platform for top experts "Codereet"

모두의 코딩

A coding-specialized training platform that anyone can share and learn knowledge "ModuCoding"
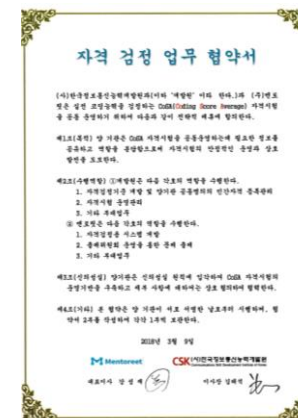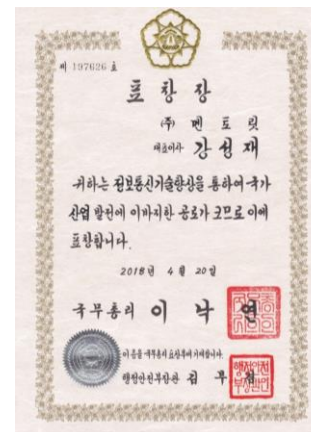
8. Company introduction

Mentoreet

"Having the Best Programming Professionals in Korea"

Kang Sung Jae   CEO

Director of the Korea Internet Agency (KISA)
MSIP Software Maestro Mentor
List of Prime Ministers of Science and
Technology Day 2018

former)
Manager of Microsoft Platform Strategy
Visual Studio Ranger for the first time in
Korea
Director of the Korea Game Developers
Association

Kang Bo Ram   CPO

MSIP Software Maestro Mentor
Microsoft C# MVP

former)
Head of Smart Care Works Research
Center
Director of OMP Platform Development
Monthly Microsoftware Author

Park Se Sik   CTO

Microsoft ASP.NET MVP
MSIP IITP assessor
Mentor Hanium of MSIP

former)
MSDN Technical White Paper Author
Samsung Global Social Services
Operations