



HIGHER SCHOOL OF ECONOMICS  
NATIONAL RESEARCH UNIVERSITY

Oct 5, 2020

# Sandipan Dey

has successfully completed

## Advanced Algorithms and Complexity

an online non-credit course authorized by University of California San Diego and HSE University and offered through Coursera

Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Neil Rhodes, Adjunct Faculty; Daniel M Kane, Assistant Professor, Computer Science and Engineering at the University of California, San Diego

### COURSE CERTIFICATE



Verify at [coursera.org/verify/98GUXPKYG6RF](https://coursera.org/verify/98GUXPKYG6RF)

Coursera has confirmed the identity of this individual and their participation in the course.



JOHNS HOPKINS  
UNIVERSITY

02/21/2018

# Sandipan Dey

has successfully completed

## Advanced Linear Models for Data Science 1: Least Squares

an online non-credit course authorized by Johns Hopkins University and offered through Coursera



Brian Caffo, PhD, MS  
Department of Biostatistics  
Johns Hopkins Bloomberg School of Public Health

## COURSE CERTIFICATE



Verify at [coursera.org/verify/595ASMRUWWLC](https://coursera.org/verify/595ASMRUWWLC)

Coursera has confirmed the identity of this individual and their participation in the course.



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Advanced Predictive Modeling: Mastering Ensembles and Metamodeling

Course completed on Jun 10, 2020 • 1 hour 10 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AxtABxiTCBiKG74H1SI-5ptbonDU



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Advanced Python

Course completed on May 31, 2020 • 2 hours 27 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in black ink that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AcTzo80VPuHQVsGfxz7gLrx6qVII



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### AI Algorithms for Gaming

Course completed on May 26, 2020 • 2 hours 5 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AQrcDM5PqifQlFZy8LFcC07WSbj



Sep 23, 2020

## Sandipan Dey

has successfully completed

### AI for Medical Diagnosis

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

A handwritten signature in blue ink that reads "Pranav Rajpurkar" followed by "Soham Dey".

Pranav Rajpurkar, PhD Candidate at Stanford University

## COURSE CERTIFICATE



Verify at [coursera.org/verify/VVM65KUA7HP2](https://coursera.org/verify/VVM65KUA7HP2)

Coursera has confirmed the identity of this individual and their participation in the course.



Sep 24, 2020

## Sandipan Dey

has successfully completed

### AI for Medical Prognosis

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

A handwritten signature in blue ink that reads "Pranav Rajpurkar" followed by "Soham Dey".

Pranav Rajpurkar, PhD Candidate at Stanford University

### COURSE CERTIFICATE



Verify at [coursera.org/verify/FG6FNGQHSVXE](https://coursera.org/verify/FG6FNGQHSVXE)

Coursera has confirmed the identity of this individual and their participation in the course.



Sep 26, 2020

## Sandipan Dey

has successfully completed

### AI For Medical Treatment

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

A handwritten signature in blue ink that reads "Pranav Rajpurkar" followed by "Soham Dey".

Pranav Rajpurkar, PhD Candidate at Stanford University

### COURSE CERTIFICATE



Verify at [coursera.org/verify/KDF5DDEAZFGC](https://coursera.org/verify/KDF5DDEAZFGC)

Coursera has confirmed the identity of this individual and their participation in the course.



3 Courses

AI for Medical Diagnosis  
AI for Medical Prognosis  
AI For Medical Treatment



Sep 26, 2020

## Sandipan Dey

has successfully completed the online, non-credit Specialization

# AI for Medicine

In this Specialization, you gained practical experience applying machine learning to concrete problems in medicine. You learned how to diagnose chest x-rays and brain scans, evaluate your models, handle missing data, and estimate the effect of treatments. Now you can help transform the practice of medicine worldwide. You can go on to pursue a career in the medical industry as a data scientist, machine learning engineer, innovation officer, or business analyst!

Pranav Rajpurkar 

Pranav Rajpurkar, PhD  
Candidate at Stanford  
University

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Verify this certificate at:  
[coursera.org/verify/specialization/GMR5FV7AESET](https://coursera.org/verify/specialization/GMR5FV7AESET)



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### AI The LinkedIn Way: A Conversation with Deepak Agarwal

Course completed on May 29, 2020 • 31 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: ATbjrt5MllmsOMaE3-9ygPT2-8uK

NOVEMBER 07, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED RICE UNIVERSITY'S ONLINE OFFERING OF



### Algorithmic Thinking

This class trained students in the mathematical concepts and processes of "Algorithmic Thinking". The class blended a combination of theory, implementation, and mathematical analysis with the goal of building simpler, more efficient solutions to computational problems.



LUAY NAKLEH  
ASSOCIATE PROFESSOR  
DEPT. OF COMPUTER SCIENCE, RICE UNIVERSITY


SCOTT RIXNER  
PROFESSOR  
DEPT. OF COMPUTER SCIENCE, RICE UNIVERSITY

JOE WARREN  
PROFESSOR  
DEPT. OF COMPUTER SCIENCE, RICE UNIVERSITY

NOVEMBER 05, 2013

# Online Course Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



### Algorithms: Design and Analysis, Part 1

Congratulations! You have successfully completed the free online offering of Design and Analysis of Algorithms I. To successfully complete this free online class, students were required to watch lectures, complete quizzes and automated exercises, and take a final exam.



---

TIM ROUGHGARDEN  
ASSOCIATE PROFESSOR OF COMPUTER SCIENCE  
STANFORD UNIVERSITY

PLEASE NOTE: SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS PARTICIPANT WAS ENROLLED AS A STUDENT AT STANFORD UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A STANFORD UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE PARTICIPANT.

FEBRUARY 16, 2013

# Online Course Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



### Algorithms: Design and Analysis, Part 2

This course covered greedy algorithms, including applications to minimum spanning trees and Huffman codes; dynamic programming, including applications to sequence alignment and shortest-path problems; and exact and approximation algorithms for NP-complete problems.



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TIM ROUGHGARDEN  
ASSOCIATE PROFESSOR OF COMPUTER SCIENCE  
STANFORD UNIVERSITY

PLEASE NOTE: SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS PARTICIPANT WAS ENROLLED AS A STUDENT AT STANFORD UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A STANFORD UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE PARTICIPANT.

## Statement of Accomplishment

# Algorithms: Design and Analysis, Part I

Name: Sandipan Dey

Email: sandipan.dey@gmail.com

Congratulations! You have successfully completed the free online offering of Design and Analysis of Algorithms I, offered March through April, 2012. To successfully complete this free online class, students were required to watch lectures, complete quizzes and automated exercises, and take a final exam. According to our automated system, your scores on these components were as follows:

|                          |             |                                |
|--------------------------|-------------|--------------------------------|
| - Problem Sets:          | <b>37.6</b> | out of a maximum of <b>40</b>  |
| - Programming Exercises: | <b>30.0</b> | out of a maximum of <b>30</b>  |
| - Exams:                 | <b>26.0</b> | out of a maximum of <b>30</b>  |
| - Scaled Total:          | <b>93.6</b> | out of a maximum of <b>100</b> |

We thank you for your interest in studying algorithms, and look forward to seeing you again soon.

Sincerely,



Tim Roughgarden

Associate Professor of Computer Science

**Please note:** This online offering of Algorithms: Design and Analysis, Part I, does not reflect the entire curriculum offered to students enrolled at Stanford University. This statement does not affirm that you were enrolled as a Stanford student in any way; it does not confer a Stanford grade; it does not confer Stanford credit; it does not confer a Stanford degree or a certificate; and it does not verify the identity of the individual who took the course.



# UC San Diego



HIGHER SCHOOL OF ECONOMICS  
NATIONAL RESEARCH UNIVERSITY

Oct 1, 2020

## Sandipan Dey

has successfully completed

### Algorithms on Graphs

an online non-credit course authorized by University of California San Diego and HSE University and offered through Coursera



A handwritten signature in black ink, appearing to read "Sandipan Dey" followed by three other names in cursive script.

Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Neil Rhodes, Adjunct Faculty; Daniel M Kane, Assistant Professor, Computer Science and Engineering at the University of California, San Diego

## COURSE CERTIFICATE



Verify at [coursera.org/verify/WB54J4YJ77TA](https://coursera.org/verify/WB54J4YJ77TA)

Coursera has confirmed the identity of this individual and their participation in the course.



Oct 5, 2020

# Sandipan Dey

has successfully completed

## Algorithms on Strings

an online non-credit course authorized by University of California San Diego and HSE University and offered through Coursera

Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Pavel A. Pevzner, Ronald R. Taylor  
Distinguished Professor of Computer Science, Director, NIH Center for Computational Mass Spectrometry; Neil Rhodes,  
Adjunct Faculty  
Department of Computer Science and Engineering  
University of California, San Diego

## COURSE CERTIFICATE



Verify at [coursera.org/verify/M9FD8XFYYYN5](https://coursera.org/verify/M9FD8XFYYYN5)

Coursera has confirmed the identity of this individual and their participation in the course.

# An Intuitive Introduction to Probability

by University of Zurich



Karl Schmedders

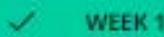


Welcome to An Intuitive Introduction to Probability! You're joining thousands of learners currently enrolled in the course. I'm excited to have you here.

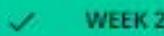
⌄ More

## Congratulations!

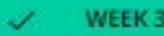
You've successfully completed *An Intuitive Introduction to Probability*



WEEK 1



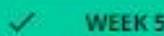
WEEK 2



WEEK 3



WEEK 4



WEEK 5



Yes, I'd like to receive email about other programs from University of Zurich.

Yes



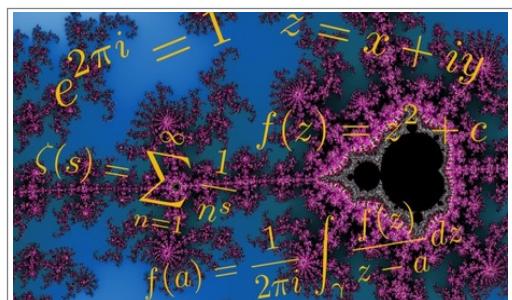
|   | Due    | Weight | Passed | Grade |
|---|--------|--------|--------|-------|
| <b>Probability</b>  |        |        |        |       |
|  <b>Quiz:</b> Introductory Quiz 1 question | Apr 9  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 1.1 2 questions              | Apr 9  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 1.2 3 questions              | Apr 9  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 1.3 2 questions              | Apr 9  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 1.4 2 questions              | Apr 9  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 1.5 2 questions              | Apr 9  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 1.6 2 questions              | Apr 9  | 3%     | ✓      | 100%  |
| <hr/> <b>Conditional Probability</b>  |        |        |        |       |
|  <b>Quiz:</b> 2.1 2 questions              | Apr 16 | 4%     | ✓      | 100%  |
|  <b>Quiz:</b> 2.2 2 questions              | Apr 16 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 2.3 2 questions              | Apr 16 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 2.4 2 questions              | Apr 16 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 2.5 2 questions              | Apr 16 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 2.6 2 questions              | Apr 16 | 3%     | ✓      | 100%  |
| <hr/> <b>Application</b>  |        |        |        |       |
|  <b>Quiz:</b> 3.1 2 questions              | Apr 23 | 4%     | ✓      | 100%  |
|  <b>Quiz:</b> 3.2 1 question               | Apr 23 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 3.3.1 3 questions            | Apr 23 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 3.3.2 2 questions            | Apr 23 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 3.4 3 questions              | Apr 23 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 3.5 3 questions             | Apr 23 | 3%     | ✓      | 100%  |
| <hr/> <b>Discrete Random Variables</b>  |        |        |        |       |
|  <b>Quiz:</b> 4.1 2 questions            | Apr 30 | 4%     | ✓      | 100%  |
|  <b>Quiz:</b> 4.2 3 questions            | Apr 30 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 4.3 2 questions            | Apr 30 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 4.4 2 questions            | Apr 30 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 4.5 1 question             | Apr 30 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 4.6 2 questions            | Apr 30 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 4.7 3 questions            | Apr 30 | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 4.8 2 questions            | Apr 30 | 3%     | ✓      | 100%  |
| <hr/> <b>Normal Distribution</b>  |        |        |        |       |
|  <b>Quiz:</b> 5.1 2 questions            | May 7  | 4%     | ✓      | 100%  |
|  <b>Quiz:</b> 5.2 2 questions            | May 7  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 5.3 2 questions            | May 7  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 5.4 2 questions            | May 7  | 3%     | ✓      | 100%  |
|  <b>Quiz:</b> 5.5 2 questions            | May 7  | 3%     | ✓      | 100%  |

JANUARY 13, 2014

# Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED WESLEYAN UNIVERSITY'S ONLINE OFFERING OF



### Analysis of a Complex Kind

This undergraduate course starts with an introduction to complex numbers, continues through the foundations of complex analysis and touches upon some advanced topics including some outstanding conjectures in the field.

*Petra Bonfert-Taylor*

---

PROFESSOR PETRA BONFERT-TAYLOR  
VISITING SCHOLAR IN MATHEMATICS  
WESLEYAN UNIVERSITY

PLEASE NOTE: THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT WESLEYAN UNIVERSITY. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT WESLEYAN UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A WESLEYAN UNIVERSITY GRADE; IT DOES NOT CONFER WESLEYAN UNIVERSITY CREDIT; IT DOES NOT CONFER A WESLEYAN UNIVERSITY DEGREE; AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Applied Machine Learning: Algorithms

Course completed on May 27, 2020 • 2 hours 24 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AQBTrkmES7ZzJhB8gBh4j5pG7hLW



09/15/2017

# Sandipan Dey

has successfully completed

## Applied Social Network Analysis in Python

an online non-credit course authorized by University of Michigan and offered through  
Coursera

A handwritten signature in black ink, appearing to read "Daniel Romero, Ph.D.".

Daniel Romero, Ph.D.  
Assistant Professor  
School of Information  
University of Michigan

## COURSE CERTIFICATE



Verify at [coursera.org/verify/V6A836AQZE5E](https://coursera.org/verify/V6A836AQZE5E)

Coursera has confirmed the identity of this individual and  
their participation in the course.



08/06/2017

# Sandipan Dey

has successfully completed

## Applied Text Mining in Python

an online non-credit course authorized by University of Michigan and offered through  
Coursera

A handwritten signature in black ink that reads "V.G. Vinod Vydiswaran".

V. G. Vinod Vydiswaran  
Assistant Professor  
School of Information

## COURSE CERTIFICATE



Verify at [coursera.org/verify/N75T8WE96XHQ](https://coursera.org/verify/N75T8WE96XHQ)

Coursera has confirmed the identity of this individual and  
their participation in the course.



Nov 7, 2020

## Sandipan Dey

has successfully completed

### Apply Generative Adversarial Networks (GANs)

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

A handwritten signature in black ink that appears to read "Sandipan Dey".

---

Sharon Zhou, Course Instructor, DeepLearning.AI  
Eda Zhou, Curriculum Developer, DeepLearning.AI  
Eric Zelikman, Curriculum Developer, DeepLearning.AI

## COURSE CERTIFICATE



Verify at [coursera.org/verify/4EE2EZPJMVTL](https://coursera.org/verify/4EE2EZPJMVTL)

Coursera has confirmed the identity of this individual and their participation in the course.



## Course Home

Week 1

Week 2

Week 3

Week 4

Week 5

Grades

Discussion Forums

Course Info

## Approximation Algorithms Part I

by École normale supérieure



Claire Mathieu

X

Welcome to Approximation Algorithms Part I! You're joining thousands of learners currently enrolled in the course. I'm excited to have you in!

▼ More

Congratulations!

You've successfully completed Approximation Algorithms Part I!



✓ WEEK 1

▼

✓ WEEK 2

▼

✓ WEEK 3

▼

✓ WEEK 4

▼

✓ WEEK 5

▼



5/5

Assignments Passed

97%

Final Course Grade

Course Home

**Grades**

Discussion Forums

Vertex cover and Linear Programming

|   |  | Due    | Weight | Passed | Grade |
|---|--|--------|--------|--------|-------|
|  | <b>Peer-graded Assignment:</b> Peer Graded Assignment 1 2h | Dec 13 | 20%    | ✓      | 100%  |
|  | <b>Review Your Peers:</b> Peer Graded Assignment 1         | Dec 16 | 20%    | ✓      | —     |

Course Info

Knapsack and Rounding

|   |  | Due    | Weight | Passed | Grade |
|---|--|--------|--------|--------|-------|
|  | <b>Peer-graded Assignment:</b> Peer Assignment Knapsack 2h | Dec 20 | 20%    | ✓      | 100%  |
|  | <b>Review Your Peers:</b> Peer Assignment Knapsack         | Dec 23 | 20%    | ✓      | —     |

Bin Packing, Linear Programming and Rounding

|   |  | Due    | Weight | Passed | Grade |
|---|--|--------|--------|--------|-------|
|    | <b>Peer-graded Assignment:</b> Peer Assignment: Bin-Packing 2h | Dec 27 | 20%    | ✓      | 100%  |
|  | <b>Review Your Peers:</b> Peer Assignment: Bin-Packing         | Dec 30 | 20%    | ✓      | —     |

Set Cover and Randomized Rounding

|   |  | Due   | Weight | Passed | Grade |
|---|--|-------|--------|--------|-------|
|  | <b>Peer-graded Assignment:</b> Peer Assig Set Cover 2h | Jan 3 | 20%    | ✓      | 100%  |
|  | <b>Review Your Peers:</b> Peer Assig Set Cover         | Jan 6 | 20%    | ✓      | —     |

Multiway Cut and Randomized Rounding

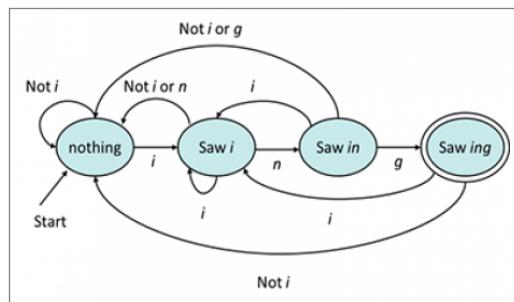
|   |  | Due    | Weight | Passed | Grade |
|---|--|--------|--------|--------|-------|
|  | <b>Peer-graded Assignment:</b> Peer-graded assignment 5 2h | Jan 10 | 20%    | ✓      | 85%   |
|  | <b>Review Your Peers:</b> Peer-graded assignment 5         | Jan 13 | 20%    | ✓      | —     |

DECEMBER 06, 2012

# Online Course Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



### Automata

The course covered four broad areas: (1) Finite automata and regular expressions, (2) Context-free grammars, (3) Turing machines and decidability, and (4) the theory of intractability, or NP-complete problems.

JEFFREY ULLMAN  
PROFESSOR OF COMPUTER SCIENCE,  
STANFORD UNIVERSITY

PLEASE NOTE: SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS PARTICIPANT WAS ENROLLED AS A STUDENT AT STANFORD UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A STANFORD UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE PARTICIPANT.



HIGHER SCHOOL OF ECONOMICS  
NATIONAL RESEARCH UNIVERSITY

Sep 3, 2020

# Sandipan Dey

has successfully completed with honors

## Bayesian Methods for Machine Learning

an online non-credit course authorized by HSE University and offered through Coursera

*D. Polykovskiy & Novikov*

---

Daniil Polykovskiy  
Sr. Research Scientist  
HSE Faculty of Computer Science

Alexander Novikov  
Researcher  
HSE Faculty of Computer Science

## COURSE CERTIFICATE

WITH HONORS



Verify at [coursera.org/verify/N5DJXK9S3B8A](https://coursera.org/verify/N5DJXK9S3B8A)

Coursera has confirmed the identity of this individual and their participation in the course.



08/11/2016

# Sandipan Dey

has successfully completed with honors

## Bayesian Statistics: From Concept to Data Analysis

an online non-credit course authorized by University of California, Santa Cruz and offered through Coursera

A handwritten signature in black ink that reads "Herbert Lee".

Herbert Lee  
Professor  
Applied Mathematics and Statistics

## COURSE CERTIFICATE

WITH HONORS



Verify at [coursera.org/verify/837SYUZCN696](https://coursera.org/verify/837SYUZCN696)

Coursera has confirmed the identity of this individual and their participation in the course.

# Bayesian Statistics: From Concept to Data Analysis

by University of California, Santa Cruz



Herbert Lee



Thanks for signing up for this course in Bayesian Statistics. I'm excited to help you learn about this powerful approach to data analysis. This course is designed for people who have some basic knowledge of statistics and probability, and want to learn how to apply these concepts in a Bayesian framework.

▼ More

## Congratulations!

You've successfully completed Bayesian Statistics: From Concept to Data Analysis



✓ WEEK 1



✓ WEEK 2



✓ WEEK 3



✓ WEEK 4



14/14

100%

Assignments Passed

Final Course Grade

WITH HONORS

Due Weight Passed Grade

### Probability and Bayes' Theorem

|                                     |       |    |   |      |
|-------------------------------------|-------|----|---|------|
| Quiz: Lesson 1 · 8 questions        | Aug 7 | 7% | ✓ | 100% |
| Quiz: Lesson 2 · 9 questions        | Aug 7 | 7% | ✓ | 100% |
| Quiz: Lesson 3.1 · 10 questions     | Aug 7 | 7% | ✓ | 100% |
| Quiz: Lesson 3.2-3.3 · 11 questions | Aug 7 | 7% | ✓ | 100% |

### Statistical Inference

|                                    |        |    |   |      |
|------------------------------------|--------|----|---|------|
| Quiz: Lesson 4 · 6 questions       | Aug 14 | 7% | ✓ | 100% |
| Quiz: Lesson 5.1-5.2 · 9 questions | Aug 14 | 7% | ✓ | 100% |
| Quiz: Lesson 5.3-5.4 · 8 questions | Aug 14 | 7% | ✓ | 100% |

### Priors and Models for Discrete Data

|                               |        |    |   |      |
|-------------------------------|--------|----|---|------|
| Quiz: Lesson 6 · 6 questions  | Aug 21 | 7% | ✓ | 100% |
| Quiz: Lesson 7 · 10 questions | Aug 21 | 8% | ✓ | 100% |
| Quiz: Lesson 8 · 10 questions | Aug 21 | 7% | ✓ | 100% |

### Models for Continuous Data

|                                |        |    |   |      |
|--------------------------------|--------|----|---|------|
| Quiz: Lesson 9 · 10 questions  | Aug 28 | 7% | ✓ | 100% |
| Quiz: Lesson 10 · 10 questions | Aug 28 | 8% | ✓ | 100% |
| Quiz: Lesson 11 · 5 questions  | Aug 28 | 7% | ✓ | 100% |
| Quiz: Regression · 6 questions | Aug 28 | 7% | ✓ | 100% |

### Optional Honors Assignments

These are optional assignments. If you complete all of them, you will receive Honors recognition when you complete the course. Learn more.

Due Passed

|  |        |   |
|--|--------|---|
| Honors Quiz: Module 1 Honors · 8 questions | Aug 7  | ✓ |
| Honors Quiz: Module 2 Honors · 4 questions | Aug 14 | ✓ |
| Honors Quiz: Module 3 Honors · 4 questions | Aug 21 | ✓ |
| Honors Quiz: Module 4 Honors · 4 questions | Aug 28 | ✓ |

FEBRUARY 24, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Bioinformatics Algorithms (Part 1)

This advanced undergraduate course provides an introduction to bioinformatics algorithms.

---

*Phillip Compeau*

PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING,  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

---

*Pavel A. Pevzner*

PAVEL A. PEVZNER  
RONALD R. TAYLOR DISTINGUISHED PROF. OF  
COMPUTER SCIENCE  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS  
SPECTROMETRY  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

---

*Nikolay Vyahhi*

NIKOLAY VYAHHI, VISITING SCHOLAR  
DEPARTMENT OF COMPUTER SCIENCE AND  
ENGINEERING, UNIVERSITY OF CALIFORNIA, SAN DIEGO

JULY 19, 2015

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Bioinformatics Algorithms (Part 2)

This advanced undergraduate course provides additional insights into the algorithms needed to answer many questions in modern biology.

---

PAVEL A. PEVZNER, RONALD R. TAYLOR DISTINGUISHED PROFESSOR  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS SPECTROMETRY  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

---

DR. PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

PLEASE NOTE: THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT THE UNIVERSITY OF CALIFORNIA, SAN DIEGO. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT THE UNIVERSITY OF CALIFORNIA, SAN DIEGO IN ANY WAY. IT DOES NOT CONFER A UNIVERSITY OF CALIFORNIA, SAN DIEGO GRADE; IT DOES NOT CONFER UNIVERSITY OF CALIFORNIA, SAN DIEGO CREDIT; IT DOES NOT CONFER A UNIVERSITY OF CALIFORNIA, SAN DIEGO DEGREE; AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.

OCTOBER 27, 2015

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Finding Hidden Messages in DNA (Bioinformatics I)

In this course, we look for hidden messages in DNA without ever needing to put on a lab coat. After warming up our algorithmic muscles, we learn how randomized algorithms can be used to solve problems in bioinformatics.



---

PAVEL A. PEVZNER  
RONALD R. TAYLOR DISTINGUISHED PROF. OF  
COMPUTER SCIENCE  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS  
SPECTROMETRY  
UNIVERSITY OF CALIFORNIA, SAN DIEGO



---

PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

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OCTOBER 27, 2015

# Statement of Accomplishment

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## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Genome Sequencing (Bioinformatics II)

In this course, we saw how graph theory and brute force algorithms can be used to reconstruct genomes and antibiotics, respectively.



---

PAVEL A. PEVZNER  
RONALD R. TAYLOR DISTINGUISHED PROF. OF  
COMPUTER SCIENCE  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS  
SPECTROMETRY  
UNIVERSITY OF CALIFORNIA, SAN DIEGO



---

PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

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SEPTEMBER 17, 2015

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Comparing Genes, Proteins, and Genomes (Bioinformatics III)

In this course, we used dynamic programming to compare two genes or proteins. We then employed combinatorial algorithms when we "zoomed out" to compare entire genomes.

---

*Paul Pevn*

PAVEL A. PEVZNER  
RONALD R. TAYLOR DISTINGUISHED PROF. OF COMPUTER SCIENCE  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS SPECTROMETRY  
NIKOLAY VYAHHI.  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

---

*Phillip Compeau*

PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING,  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

NIKOLAY VYAHHI, VISITING SCHOLAR  
DEPARTMENT OF COMPUTER SCIENCE AND  
ENGINEERING, UNIVERSITY OF CALIFORNIA, SAN DIEGO

NOVEMBER 26, 2015

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Molecular Evolution (Bioinformatics IV)

This advanced undergraduate course provides additional insights into the algorithms needed to answer many questions in modern biology.

---

PAVEL A. PEVZNER  
RONALD R. TAYLOR DISTINGUISHED PROF. OF  
COMPUTER SCIENCE  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS  
SPECTROMETRY  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

---

PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

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FEBRUARY 04, 2016

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Genomic Data Science and Clustering (Bioinformatics V)

This advanced undergraduate course provides additional insights into the algorithms needed to answer many questions in modern biology.

---

PAVEL A. PEVZNER  
RONALD R. TAYLOR DISTINGUISHED PROF. OF  
COMPUTER SCIENCE  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS  
SPECTROMETRY  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

---

PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

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MARCH 28, 2016

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Finding Mutations in DNA and Proteins (Bioinformatics VI)

This course provides additional insights into the algorithms needed to answer many questions in modern biology.



---

PAVEL A. PEVZNER  
RONALD R. TAYLOR DISTINGUISHED PROF. OF  
COMPUTER SCIENCE  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS  
SPECTROMETRY  
UNIVERSITY OF CALIFORNIA, SAN DIEGO



---

PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

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MARCH 16, 2016

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF CALIFORNIA, SAN DIEGO'S ONLINE OFFERING OF



### Biology Meets Programming: Bioinformatics for Beginners

This undergraduate course introduces students with limited programming experience to some of the key algorithmic ideas in modern computational biology.

A handwritten signature in cursive script, appearing to read "Pavel A. Pevzner".

---

PAVEL A. PEVZNER  
RONALD R. TAYLOR DISTINGUISHED PROF. OF  
COMPUTER SCIENCE  
DIRECTOR, NIH CENTER FOR COMPUTATIONAL MASS  
SPECTROMETRY  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

A handwritten signature in cursive script, appearing to read "Phillip Compeau".

---

PHILLIP COMPEAU  
DEPT OF COMPUTER SCIENCE & ENGINEERING  
UNIVERSITY OF CALIFORNIA, SAN DIEGO

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LinkedIn LEARNING

# Certificate of Completion

Congratulations, Sandipan Dey

## Blockchain Basics

Course completed on Jun 3, 2020 • 57 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: ATG12rf0oLq\_4ZGftfKwYSfNhyoQ



Nov 4, 2020

## Sandipan Dey

has successfully completed

### Build Basic Generative Adversarial Networks (GANs)

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

A handwritten signature in black ink that appears to read "Sandipan Dey".

---

Sharon Zhou, Course Instructor, DeepLearning.AI  
Eda Zhou, Curriculum Developer, DeepLearning.AI  
Eric Zelikman, Curriculum Developer, DeepLearning.AI

## COURSE CERTIFICATE



Verify at [coursera.org/verify/XUJKSR7BAMBR](https://coursera.org/verify/XUJKSR7BAMBR)

Coursera has confirmed the identity of this individual and their participation in the course.



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

# Building a Recommendation System with Python Machine Learning & AI

Course completed on May 13, 2020 • 1 hour 38 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AVKMwQB9dK3ZbJAkqJTG9tCEb9Cb



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

# Building Recommender Systems with Machine Learning and AI

Course completed on Jun 10, 2020 • 9 hours 5 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Stanley".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AbLfqTaw8nCuxFnv1zMcbuDgi-gT

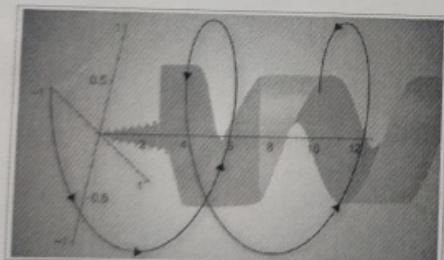
MAY 03, 2013

## Statement of Accomplishment

WITH DISTINCTION

### SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE OHIO STATE UNIVERSITY'S ONLINE OFFERING OF



#### Calculus One

This undergraduate course is a one semester introduction to the differential and integral calculus, covering the definition, techniques, and applications of limits, derivatives, and integrals.

JIM FOWLER, PH.D.  
DEPARTMENT OF MATHEMATICS  
THE OHIO STATE UNIVERSITY

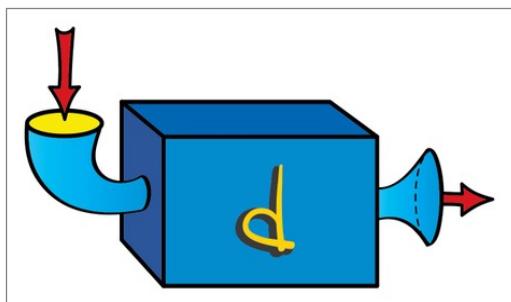
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APRIL 15, 2013

# Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF PENNSYLVANIA'S ONLINE OFFERING OF



### Calculus: Single Variable

This course provides a brisk, entertaining treatment of differential and integral calculus, with an emphasis on conceptual understanding and applications to the engineering, physical, and social sciences.

PROF. ROBERT W. GHRIST  
ANDREA MITCHELL PIK UNIVERSITY PROFESSOR  
DEPARTMENTS OF MATHEMATICS AND ELECTRICAL & SYSTEMS ENGINEERING  
UNIVERSITY OF PENNSYLVANIA

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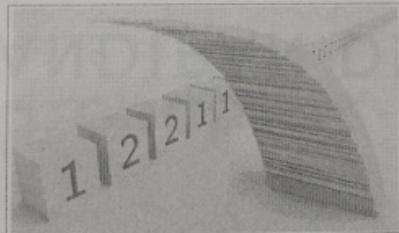
DECEMBER 06, 2013

# Statement of Accomplishment

**WITH DISTINCTION**

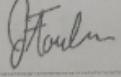
## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE OHIO STATE UNIVERSITY'S ONLINE OFFERING OF



### Calculus Two: Sequences and Series

This second course in calculus covers sequences and series, including convergence tests, alternating series, power series, and Taylor series.



JIM FOWLER, PH.D.  
DEPARTMENT OF MATHEMATICS  
THE OHIO STATE UNIVERSITY

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Sandipan Dey <sandipan.dey@gmail.com>

## Course Mastery Badge

1 message

Jiawei Han <no-reply@illinois.edu>  
Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>  
To: sandipan.dey@gmail.com

Wed, Jun 10, 2015 at 11:51 PM

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Hello Sandipan Dey,

Congratulations on earning the **Course Mastery Badge** for your efforts in the Cluster Analysis course offered by the [University of Illinois at Urbana-Champaign](#)! Your average total score of 95% or higher on the quizzes in this course qualified you for this badge.

As a special reward, we would like to include your name in the [Hall of Fame](#) page to be posted within the course and future offerings of the course. To do so, please [fill out this form](#) by June 19 and we will add your name to the Hall of Fame. Your email address will NOT be shared on the Hall of Fame page.

Thank you for your active participation in this course. I wish you the best!

Jiawei Han  
Abel Bliss Professor Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



Course  
Mastery  
Badge



Sandipan Dey &lt;sandipan.dey@gmail.com&gt;

## Course Mastery Badge

1 message

Jiawei Han <no-reply@illinois.edu>

Wed, Jun 10, 2015 at 11:51 PM

Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>

To: sandipan.dey@gmail.com

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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Thank you for your active participation in this course. I wish you the best!

Jiawei Han  
Abel Bliss Professor Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



Course  
Mastery  
Badge

[University Administration](#)[Urbana Campus](#)[Chicago Campus](#)[Springfield Campus](#)



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Code Clinic: R

Course completed on May 29, 2020 • 1 hour 18 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AVCGdJr\_J\_l5-wGF34VsDqOKaFDI

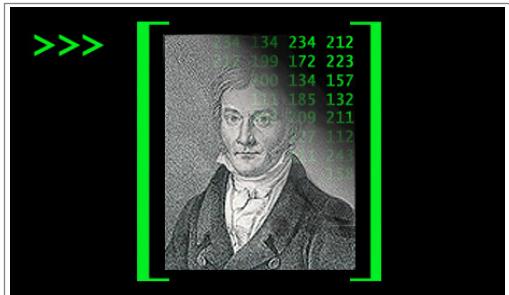
OCTOBER 10, 2013

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE REQUIREMENTS FOR



### Coding the Matrix: Linear Algebra through Computer Science Applications

In this class, you have learned key concepts and methods of linear algebra, using them to think about problems in computer science. You have implemented basic matrix and vector functionality and algorithms, and used them to process real-world data.

---

PHILIP KLEIN  
DEPARTMENT OF COMPUTER SCIENCE  
BROWN UNIVERSITY

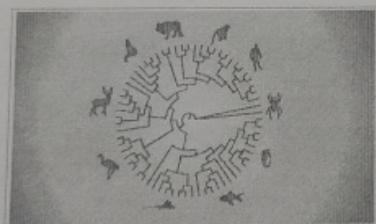
SEPTEMBER 11, 2013

## Statement of Accomplishment

WITH DISTINCTION

# SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE  
PROVIDED BY THE TECHNICAL UNIVERSITY OF DENMARK THROUGH COURSERA.



### Computational Molecular Evolution

Congratulations! You have successfully completed the Computational Molecular Evolution course. The course consisted of 6 blocks of lectures (6 hours in total) and 13 quizzes based on lecture content, handout exercises and computer exercises.

ANDERS GORM PEDERSEN, PROFESSOR, PH.D.  
CENTER FOR BIOLOGICAL SEQUENCE ANALYSIS  
DEPARTMENT OF SYSTEMS BIOLOGY  
TECHNICAL UNIVERSITY OF DENMARK

PLEASE NOTE: SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT DTU IN ANY WAY. IT DOES NOT CONFER A DTU GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.

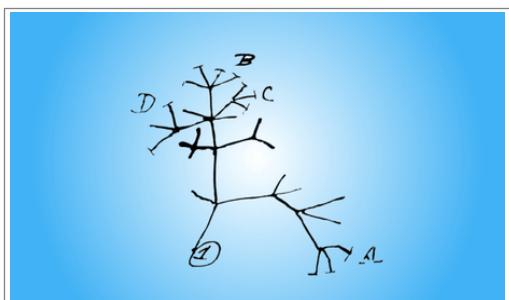
SEPTEMBER 12, 2013

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY THE TECHNICAL UNIVERSITY OF DENMARK THROUGH COURSERA.



### Computational Molecular Evolution

Congratulations! You have successfully completed the Computational Molecular Evolution course. The course consisted of 6 blocks of lectures (6 hours in total) and 13 quizzes based on lecture content, handout exercises and computer exercises.



---

ANDERS GORM PEDERSEN, PROFESSOR, PH.D.  
CENTER FOR BIOLOGICAL SEQUENCE ANALYSIS  
DEPARTMENT OF SYSTEMS BIOLOGY  
TECHNICAL UNIVERSITY OF DENMARK

MAY 06, 2013

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED GEORGIA INSTITUTE OF TECHNOLOGY'S ONLINE OFFERING OF



### Computational Photography

This course covers the basics of how computation has impacted the entire workflow of photography - how images are captured, manipulated and collaborated on, and shared.

---

IRFAN ESSA, PH.D.  
PROFESSOR, COLLEGE OF COMPUTING  
GEORGIA INSTITUTE OF TECHNOLOGY

---

DR. NELSON BAKER  
DEAN OF PROFESSIONAL EDUCATION  
GEORGIA TECH PROFESSIONAL EDUCATION

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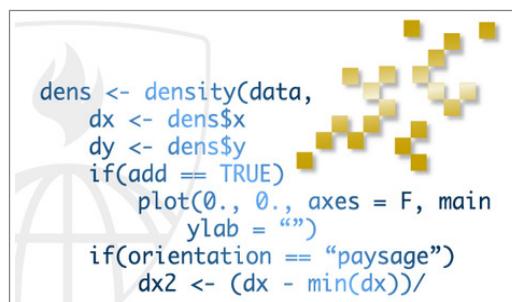
NOVEMBER 26, 2013

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### Computing for Data Analysis

In this course students learn programming in R, reading data into R, creating data graphics, accessing and installing R packages, writing R functions, debugging, and organizing and commenting R code.

A handwritten signature in black ink, appearing to read "ROGER D. PENG". It is placed over a dotted line.

ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS  
JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

PLEASE NOTE: THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT THE JOHNS HOPKINS UNIVERSITY. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT THE JOHNS HOPKINS UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A JOHNS HOPKINS UNIVERSITY GRADE; IT DOES NOT CONFER JOHNS HOPKINS UNIVERSITY CREDIT; IT DOES NOT CONFER A JOHNS HOPKINS UNIVERSITY DEGREE; AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.



12/02/2017

## Sandipan Dey

has successfully completed

### Convolutional Neural Networks

an online non-credit course authorized by deeplearning.ai and offered through  
Coursera

A handwritten signature in blue ink that reads "Andrew Ng".

Adjunct Professor Andrew Ng  
Computer Science

## COURSE CERTIFICATE



Verify at [coursera.org/verify/USHJHDJ8P4WR](https://coursera.org/verify/USHJHDJ8P4WR)

Coursera has confirmed the identity of this individual and  
their participation in the course.

| My Courses      |   |
|-----------------|---|
| Last Active     |   |
| Inactive        |   |
| Completed       |   |
| Updates         | 3 |
| Accomplishments |   |
| Recommendations |   |

## ID Verification

Official IDs of Sandipan Dey  Verified[Request a name change](#)

Liked these courses? Say thanks to your instructors!

[Fibonacci Numbers and the Golden Ratio](#)[Bayesian Statistics: From Concept to Data Analysis](#)[Framework for Data Collection and Analysis](#)[Robotics: Estimation and Learning](#)[Fundamentals of Digital Image and Video Processing](#)[Data Management and Visualization](#)[Robotics: Perception](#)[Communicating Data Science Results](#)[Inferential Statistics](#)[Browse Catalog](#)

## Other Completed Courses

Machine Learning: Classification

University of Washington

Grade Achieved: 100.0%

Machine Learning Foundations: A Case Study Approach

University of Washington

Grade Achieved: 100.0%

|  |  |  |
|--|--|--|
| Fibonacci Numbers and the Golden Ratio             | The Hong Kong University of Science and Technology | Grade Achieved: 100.0%                       |
| Bayesian Statistics: From Concept to Data Analysis | University of California, Santa Cruz               | Grade Achieved: 100.0%<br><i>with Honors</i> |
| Framework for Data Collection and Analysis         | University of Maryland, College Park               | Grade Achieved: 100.0%                       |
| Robotics: Estimation and Learning                  | University of Pennsylvania                         | Grade Achieved: 100.0%                       |
| Fundamentals of Digital Image and Video Processing | Northwestern University                            | Grade Achieved: 98.8%                        |
| Data Management and Visualization                  | Wesleyan University                                | Grade Achieved: 100.0%                       |
| Robotics: Perception                               | University of Pennsylvania                         | Grade Achieved: 99.7%                        |
| Communicating Data Science Results                 | University of Washington                           | Grade Achieved: 83.5%                        |
| Inferential Statistics                             | University of Amsterdam                            | Grade Achieved: 97.4%                        |
| Welcome to Game Theory                             | The University of Tokyo                            | Grade Achieved: 100.0%                       |
| Data Analysis Tools                                | Wesleyan University                                | Grade Achieved: 100.0%                       |
| Robotics: Computational Motion Planning            | University of Pennsylvania                         | Grade Achieved: 100.0%                       |
| Machine Learning for Data Analysis                 | Wesleyan University                                | Grade Achieved: 100.0%                       |
| Basic Statistics                                   | University of Amsterdam                            | Grade Achieved: 99.2%                        |
| Foundations of strategic business analytics        | ESSEC Business School                              | Grade Achieved: 93.0%                        |
| Data Structures and Performance                    | University of California, San Diego                | Grade Achieved: 100.0%                       |
| Foundations of marketing analytics                 | ESSEC Business School                              | Grade Achieved: 100.0%                       |
| Advanced Data Structures in Java                   | University of California, San Diego                | Grade Achieved: 100.0%                       |
| Machine Learning With Big Data (2015)              | University of California, San Diego                | Grade Achieved: 100.0%                       |
| Introduction to Big Data Analytics (2015)          | University of California, San Diego                | Grade Achieved: 100.0%                       |
| Approximation Algorithms Part I                    | École normale supérieure                           | Grade Achieved: 97.0%                        |
| Machine Learning: Regression                       | University of Washington                           | Grade Achieved: 100.0%                       |
| Econometrics: Methods and Applications             | Erasmus University Rotterdam                       | Grade Achieved: 92.5%                        |
| Mastering Data Analysis in Excel                   | Duke University                                    | Grade Achieved: 98.8%                        |
| Practical Predictive Analytics: Models and Methods | University of Washington                           | Grade Achieved: 86.7%                        |
| Operations Analytics                               | University of Pennsylvania                         | Grade Achieved: 100.0%                       |
| Hadoop Platform and Application Framework          | University of California, San Diego                | Grade Achieved: 100.0%                       |

|  |                                      |   |
|--|--------------------------------------|---|
| Introduction to Big Data (2015)                                      | University of California, San Diego  | Grade Achieved: 100.0%  |
| Data Science in Real Life  | Johns Hopkins University             | Grade Achieved: 100.0%  |
| Data Manipulation at Scale: Systems and Algorithms                   | University of Washington             | Grade Achieved: 100.0%  |
| Customer Analytics   | University of Pennsylvania           | Grade Achieved: 100.0%  |
| Managing Data Analysis   | Johns Hopkins University             | Grade Achieved: 100.0%  |
| A Crash Course in Data Science                                       | Johns Hopkins University             | Grade Achieved: 100.0%  |
| Applied Regression Analysis  | The Ohio State University            | Grade Achieved: 97.4%<br><a href="#">View Statement of Accomplishment</a>                             |
| Principles of Computing (Part 2)                                     | Rice University                      | Grade Achieved: 100.0%<br><i>with Distinction</i>   |
| Introduction to Programming with MATLAB                              | Vanderbilt University                | Grade Achieved: 98.6%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Principles of Computing (Part 1)                                     | Rice University                      | Grade Achieved: 100.0%<br><i>with Distinction</i>   |
| Applied Logistic Regression  | The Ohio State University            | Grade Achieved: 99.0%<br><a href="#">View Statement of Accomplishment</a>                             |
| Algorithms for DNA Sequencing  | Johns Hopkins University             | Grade Achieved: 100.0%<br><i>with Distinction</i>   |
| Statistics for Genomic Data Science                                  | Johns Hopkins University             | Grade Achieved: 92.5%<br><i>with Distinction</i>  |
| Programming Mobile Applications for Android Handheld Systems: Part 1 | University of Maryland, College Park | Grade Achieved: 97.5%   |
| Genomic Data Science and Clustering (Bioinformatics V)               | University of California, San Diego  | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Python for Genomic Data Science                                      | Johns Hopkins University             | Grade Achieved: 100.0%<br><i>with Distinction</i>   |
| Comparing Genes, Proteins, and Genomes (Bioinformatics III)          | University of California, San Diego  | Grade Achieved: 91.4%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Molecular Evolution (Bioinformatics IV)                              | University of California, San Diego  | Grade Achieved: 82.7%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Finding Mutations in DNA and Proteins (Bioinformatics VI)            | University of California, San Diego  | Grade Achieved: 89.3%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Finding Hidden Messages in DNA (Bioinformatics I)                    | University of California, San Diego  | Grade Achieved: 97.6%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Genome Sequencing (Bioinformatics II)                                | University of California, San Diego  | Grade Achieved: 98.6%   |

*with Distinction*[View Statement of Accomplishment](#)

|   |  |   |
|---|--|---|
| Introduction to Natural Language Processing             | University of Michigan                     | Grade Achieved: 96.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| The Data Scientist's Toolbox                            | Johns Hopkins University                   | Grade Achieved: 99.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| R Programming   | Johns Hopkins University                   | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Getting and Cleaning Data                               | Johns Hopkins University                   | Grade Achieved: 89.0%<br><a href="#">View Statement of Accomplishment</a>                             |
| Practical Machine Learning                              | Johns Hopkins University                   | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Exploratory Data Analysis                               | Johns Hopkins University                   | Grade Achieved: 85.3%<br><a href="#">View Statement of Accomplishment</a>                             |
| Developing Data Products                                | Johns Hopkins University                   | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Regression Models                                       | Johns Hopkins University                   | Grade Achieved: 95.6%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Statistical Inference                                   | Johns Hopkins University                   | Grade Achieved: 97.5%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Algorithmic Thinking                                    | Rice University                            | Grade Achieved: 99.2%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Reproducible Research                                   | Johns Hopkins University                   | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Introduction to Mathematical Thinking                   | Stanford University                        | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Mining Massive Datasets                                 | Stanford University                        | Grade Achieved: 90.3%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Biology Meets Programming: Bioinformatics for Beginners | University of California, San Diego        | Grade Achieved: 88.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Cluster Analysis in Data Mining                         | University of Illinois at Urbana-Champaign | Grade Achieved: 100.0%  |
| Pattern Discovery in Data Mining                        | University of Illinois at Urbana-          | Grade Achieved: 97.8%   |

## Champaign

|   |  |   |
|---|--|---|
| Text Mining and Analytics               | University of Illinois at Urbana-Champaign                     | Grade Achieved: 97.5%   |
| Bioinformatics Algorithms (Part 2)      | University of California, San Diego                            | Grade Achieved: 92.7%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Data Visualization                      | University of Illinois at Urbana-Champaign                     | Grade Achieved: 100.0%  |
| Text Retrieval and Search Engines       | University of Illinois at Urbana-Champaign                     | Grade Achieved: 97.5%   |
| Probability                             | University of Pennsylvania                                     | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Calculus One                            | The Ohio State University                                      | Grade Achieved: 99.8%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Probabilistic Graphical Models          | Stanford University  | Grade Achieved: 91.3%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Linear and Integer Programming          | University of Colorado Boulder & University of Colorado System | Grade Achieved: 90.8%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Bioinformatics Algorithms (Part 1)      | University of California, San Diego                            | Grade Achieved: 96.1%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Computational Molecular Evolution       | Technical University of Denmark (DTU)                          | Grade Achieved: 99.2%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Mathematical Biostatistics Boot Camp 1  | Johns Hopkins University                                       | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Introduction to Recommender Systems     | University of Minnesota  | Grade Achieved: 88.1%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Analysis of a Complex Kind              | Wesleyan University  | Grade Achieved: 96.7%<br><a href="#">View Statement of Accomplishment</a>                             |
| Calculus Two: Sequences and Series      | The Ohio State University                                      | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Data Analysis and Statistical Inference | Duke University  | Grade Achieved: 78.9%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Natural Language Processing             | Stanford University  | Grade Achieved: 90.3%<br><a href="#">View Statement of Accomplishment</a>                             |
| Algorithms: Design and Analysis, Part 1 | Stanford University  | Grade Achieved: 93.6%   |

[View Statement of Accomplishment](#)

|  |  |   |
|--|--|---|
| Computer Science 101   | Stanford University                                      | Grade Achieved: 100.0%<br><a href="#">View Statement of Accomplishment</a>                            |
| Automata   | Stanford University                                      | Grade Achieved: 95.0%<br><a href="#">View Statement of Accomplishment</a>                             |
| Introduction to Logic  | Stanford University                                      | Grade Achieved: 100.8%<br><a href="#">View Statement of Accomplishment</a>                            |
| Game Theory  | Stanford University & The University of British Columbia | Grade Achieved: 98.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Cryptography I   | Stanford University                                      | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Social Network Analysis  | University of Michigan                                   | Grade Achieved: 93.3%<br><a href="#">View Statement of Accomplishment</a>                             |
| Calculus: Single Variable  | University of Pennsylvania                               | Grade Achieved: 86.2%<br><a href="#">View Statement of Accomplishment</a>                             |
| Neural Networks for Machine Learning   | University of Toronto                                    | Grade Achieved: 91.5%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Computing for Data Analysis  | Johns Hopkins University                                 | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Data Analysis  | Johns Hopkins University                                 | Grade Achieved: 90.1%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Algorithms: Design and Analysis, Part 2  | Stanford University                                      | Grade Achieved: 89.1%<br><a href="#">View Statement of Accomplishment</a>                             |
| Computational Photography  | Georgia Institute of Technology                          | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Introduction to Data Science   | University of Washington                                 | Grade Achieved: 96.4%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Web Intelligence and Big Data  | Indian Institute of Technology Delhi                     | Grade Achieved: 95.6%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |
| Image and video processing: From Mars to Hollywood with a stop at the hospital | Duke University  | Grade Achieved: 100.0%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a> |
| Quantum Mechanics and Quantum Computation                                      | University of California, Berkeley                       | Grade Achieved: 91.8%<br><a href="#">View Statement of Accomplishment</a>                             |
| Coding the Matrix: Linear Algebra through Computer Science Applications        | Brown University   | Grade Achieved: 98.4%<br><i>with Distinction</i><br><a href="#">View Statement of Accomplishment</a>  |

Natural Language Processing

Columbia University

Grade Achieved: 100.4%

*with Distinction*

[View Statement of Accomplishment](#)

Linear and Discrete Optimization

École Polytechnique Fédérale de  
Lausanne

Grade Achieved: 89.9%

[View Statement of Accomplishment](#)

Machine Learning

Stanford University

Grade Achieved: 100.0%

[View Statement of Accomplishment](#)



# Cryptography

## Statement of Accomplishment



Login ID: Sandipan Dey  
Name: sandipan.dey@gmail.com

Congratulations! You have successfully completed the free online offering of Cryptography (Part 1), offered June through August 2012. To successfully complete this free online class, students were required to watch lectures, complete weekly problem sets (including optional programming assignments), and take a final exam. According to our automated system, your scores on these components were as follows:

Problem Sets: 63.5 out of 63.5

Programming Assignments: 12.0 extra credit point(s)

Final Exam: 12.0 out of 13

Scaled Total<sup>1</sup>: 219.5 out of 102.5

We thank you for your interest in studying Cryptography, and for participating in our ambitious experiment to deliver quality educational content to a worldwide audience.

A handwritten signature in black ink, reading "Dan Boneh".

Dan Boneh

Professor of Computer Science

Stanford University

<sup>1</sup> The scaled total is computed as the sum of the raw score on problem sets, 10 times the raw score on programming assignments and 3 times the raw score on the final exam.

Please note: This online offering of Cryptography draws on material from our classes at Stanford University but does not reflect the entire curriculum offered to students enrolled in our courses at Stanford. This statement does not confer Stanford credit, grades, a degree or a certification or affirm that you were enrolled as a Stanford student, nor does it verify the identity of the individual who took the course.

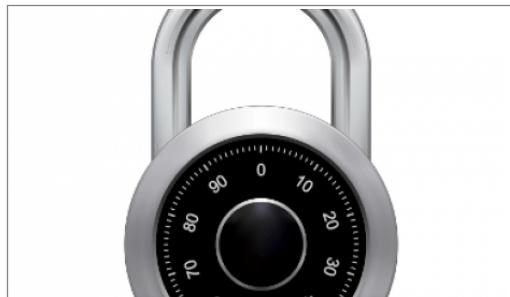
JUNE 26, 2013

# Online Course Statement of Accomplishment

WITH DISTINCTION

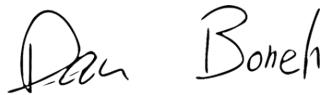
## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



### Cryptography I

Congratulations! You have successfully completed the free online offering of Cryptography. To successfully complete this free online class, students were required to watch lectures, complete weekly problem sets and take a final exam.



DAN BONEH  
PROFESSOR OF COMPUTER SCIENCE,  
STANFORD UNIVERSITY

PLEASE NOTE: SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS PARTICIPANT WAS ENROLLED AS A STUDENT AT STANFORD UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A STANFORD UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE PARTICIPANT.



Apr 27, 2021

## Sandipan Dey

has successfully completed

### Customising your models with TensorFlow 2

an online non-credit course authorized by Imperial College London and offered through Coursera

A handwritten signature in black ink that reads "K.webster".

Kevin Webster  
Senior Teaching Fellow in Statistics  
Faculty of Natural Sciences, Department of Mathematics

### COURSE CERTIFICATE



Verify at [coursera.org/verify/YJDZ6HJJ5WV3](https://coursera.org/verify/YJDZ6HJJ5WV3)

Coursera has confirmed the identity of this individual and their participation in the course.

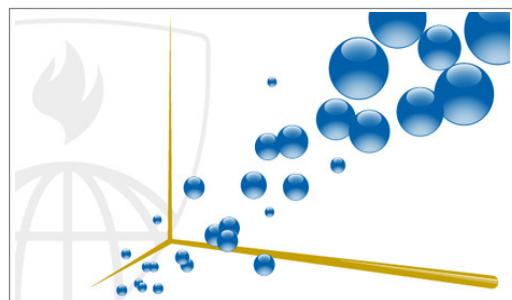
MARCH 22, 2013

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### Data Analysis

This course teaches students the most effective data analysis methods to solve problems and achieve insight.



JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS  
JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

PLEASE NOTE: THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT THE JOHNS HOPKINS UNIVERSITY. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT THE JOHNS HOPKINS UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A JOHNS HOPKINS UNIVERSITY GRADE; IT DOES NOT CONFER JOHNS HOPKINS UNIVERSITY CREDIT; IT DOES NOT CONFER A JOHNS HOPKINS UNIVERSITY DEGREE; AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.

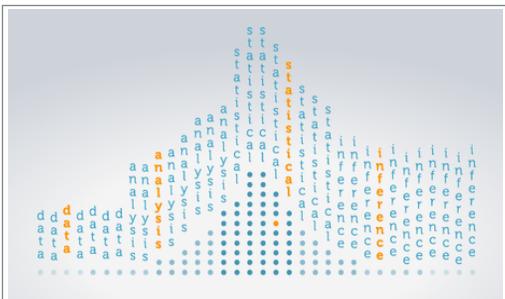
APRIL 29, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED AN ONLINE NON-CREDIT COURSE OFFERED BY DUKE UNIVERSITY.



### Data Analysis and Statistical Inference

This course introduces students to core statistical concepts such as exploratory data analysis, statistical inference and modeling, and basic probability, as well as statistical computing.



DR. MINE ÇETINKAYA-RUNDEL  
ASSISTANT PROFESSOR OF THE PRACTICE  
STATISTICAL SCIENCE, DUKE UNIVERSITY

# Data Management and Visualization

by Wesleyan University



Lisa Dierker



Welcome to Data Management and Visualization! You're joining thousands of learners currently enrolled in the course. I'm excited to have you here.

⌄ More

## Congratulations!

You've successfully completed Course 1 of 5: Data Management and Visualization

Keep going!



✓ WEEK 1



✓ WEEK 2



✓ WEEK 3



✓ WEEK 4



Like this course? Become an expert by joining the [Data Analysis and Interpretation Specialization](#).[Upgrade](#)[Course Home](#)[Grades](#)[Discussion Forums](#)[Course Info](#)

4/4

100%

Assignments Passed

Final Course Grade

Due Weight Passed Grade

## Selecting a research question

|  |        |     |   |      |
|--|--------|-----|---|------|
|  <b>Peer-graded Assignment:</b> Getting Your Research Project Started | Apr 24 | 25% |  | 100% |
|--|--------|-----|---|------|

|   |        |     |   |   |
|---|--------|-----|---|---|
|  <b>Review Your Peers:</b> Getting Your Research Project Started | Apr 27 | 25% |  | - |
|---|--------|-----|---|---|

## Writing your first program - SAS or Python

|   |    |       |     |   |      |
|---|----|-------|-----|---|------|
|  <b>Peer-graded Assignment:</b> Running Your First Program | 2h | May 1 | 25% |  | 100% |
|---|----|-------|-----|---|------|

|  |  |       |     |  |   |
|--|--|-------|-----|--|---|
|  <b>Review Your Peers:</b> Running Your First Program |  | May 4 | 25% |  | - |
|--|--|-------|-----|--|---|

## Managing Data

|   |    |       |     |   |      |
|---|----|-------|-----|---|------|
|  <b>Peer-graded Assignment:</b> Making Data Management Decisions | 2h | May 8 | 25% |  | 100% |
|---|----|-------|-----|---|------|

|  |  |        |     |   |   |
|--|--|--------|-----|---|---|
|  <b>Review Your Peers:</b> Making Data Management Decisions |  | May 11 | 25% |  | - |
|--|--|--------|-----|---|---|

## Visualizing Data

|  |    |        |     |   |      |
|--|----|--------|-----|---|------|
|  <b>Peer-graded Assignment:</b> Creating graphs for your data | 2h | May 15 | 25% |  | 100% |
|--|----|--------|-----|---|------|

|   |  |        |     |   |   |
|---|--|--------|-----|---|---|
|  <b>Review Your Peers:</b> Creating graphs for your data |  | May 18 | 25% |  | - |
|---|--|--------|-----|---|---|



Like this course? Become an expert by joining the [Data Science at Scale Specialization](#).

# Data Manipulation at Scale: Systems and Algorithms

by University of Washington

Course Home

Week 1

Week 2

Week 3

Week 4 

Grades

Discussion Forums

Course Info



Bill Howe



Welcome to Data Manipulation at Scale: Systems and Algorithms!

 More

## Congratulations!

You've successfully completed Course 1 of 4: [Data Manipulation at Scale: Systems and Algorithms](#)

Keep going!



 WEEK 1



 WEEK 2



 WEEK 3



WEEK 4

Estimated time: 4h 17m



Like this course? Become an expert by joining the [Data Science at Scale Specialization](#).[Upgrade](#)

Course Home

Grades

Discussion Forums

Course Info

3/3

Assignments Passed

100%

Final Course Grade

## Data Science Context and Concepts

|  | Due    | Weight | Passed  | Grade |
|--|--------|--------|---|-------|
|  <b>Programming Assignment:</b> Twitter Sentiment Analysis 3h | Sep 20 | 40%    |  | 100%  |

## Relational Databases and the Relational Algebra

|   |        |     |   |      |
|---|--------|-----|---|------|
|  <b>Programming Assignment:</b> SQL for Data Science Assignment 3h | Sep 27 | 30% |  | 100% |
|---|--------|-----|---|------|

## MapReduce and Parallel Dataflow Programming

|   |       |     |   |      |
|---|-------|-----|---|------|
|  <b>Programming Assignment:</b> Thinking in MapReduce 3h | Oct 4 | 30% |  | 100% |
|---|-------|-----|---|------|



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wananga o Waikato*

# Statement of Completion

20th October, 2013

Sandipan Dey

Student ID number:

has successfully completed the free, online, non-credit course

*Data Mining with Weka*

provided by the University of Waikato.



Sandipan Dey

Kaggle: Exploratory Statistics with R

Ian H. Witten

Professor Ian H. Witten  
Department of Computer Science  
University of Waikato  
Hamilton, New Zealand  
<http://www.cs.waikato.ac.nz/~ml/>

This Statement of Completion does not represent, or confer credit towards, a University of Waikato qualification. It does not affirm that this person was enrolled as a student of the University of Waikato, nor does it verify the person's identity.



Sandipan Dey &lt;sandipan.dey@gmail.com&gt;

## Data Visualization Course Mastery Badge

1 message

John C. Hart <no-reply@illinois.edu>

Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>

To: sandipan.dey@gmail.com

Tue, Aug 25, 2015 at 6:23 AM

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Hello Sandipan Dey,

Congratulations on earning the **Course Mastery Badge** for your efforts in the *Data Visualization* course offered by the [University of Illinois at Urbana-Champaign](#)! Your average total score of 95% or higher on the quizzes and programming assignments in this course qualified you for this badge.

Thank you for your active participation in this course. I wish you the best!

John C. Hart  
Professor  
[University of Illinois at Urbana-Champaign](#)



**Course  
Mastery  
Badge**

[University Administration](#)[Urbana Campus](#)[Chicago Campus](#)[Springfield Campus](#)



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Data Visualization in R with ggplot2

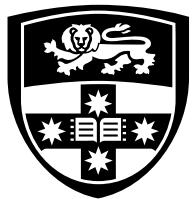
Course completed on Jun 1, 2020 • 2 hours 27 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AWoUkJe61j\_T9LeI\_azYmUBLZTpF



THE UNIVERSITY OF  
**SYDNEY**

07/27/2017

# Sandipan Dey

has successfully completed

## Data-driven Astronomy

an online non-credit course authorized by The University of Sydney and offered through Coursera

*Tara Murphy*

---

Tara Murphy  
Associate Professor  
School of Physics  
The University of Sydney

*Simon Murphy*

---

Dr Simon James Murphy  
Postdoctoral Researcher  
School of Physics

## COURSE CERTIFICATE



Verify at [coursera.org/verify/VHPEUC5B64WX](https://coursera.org/verify/VHPEUC5B64WX)

Coursera has confirmed the identity of this individual and their participation in the course.



5 Courses

Neural Networks and Deep Learning

Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization

Structuring Machine Learning Projects

Convolutional Neural Networks

Sequence Models



02/20/2018

## Sandipan Dey

has successfully completed the online, non-credit Specialization

# Deep Learning

The Deep Learning Specialization is designed to prepare learners to participate in the development of cutting-edge AI technology, and to understand the capability, the challenges, and the consequences of the rise of deep learning. Through five interconnected courses, learners develop a profound knowledge of the hottest AI algorithms, mastering deep learning from its foundations (neural networks) to its industry applications (Computer Vision, Natural Language Processing, Speech Recognition, etc.).

A handwritten blue ink signature of the name "Andrew Ng".

Adjunct Professor  
Andrew Ng  
Computer Science

Verify this certificate at:  
[coursera.org/verify/specialization/X2P3TFJLYAGW](https://coursera.org/verify/specialization/X2P3TFJLYAGW)

JULY 08, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### Developing Data Products

This course covers the basics of creating data products using Shiny, R packages, and interactive graphics. The course focuses on the statistical fundamentals of creating a data product that can be used to tell a story about data to a mass audience.

*Brian Caaffo*

BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

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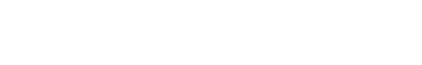


ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

*Jeffrey Leek*

JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

---



# Econometrics: Methods and Applications

by Erasmus University Rotterdam



X

Dear learners,

▼ More

## Congratulations!

You've successfully completed Econometrics: Methods and Applications



✓ WEEK 1



✓ WEEK 2



✓ WEEK 3



✓ WEEK 4



✓ WEEK 5



✓ WEEK 6



✓ WEEK 7



WEEK 8

Estimated time: 1h 24m





Course Home

## Grades

Discussion Forums

Course Info

7/7

Assignments Passed

92.5%

Final Course Grade

Due Weight Passed Grade

## Simple Regression

- |  |    |        |     |   |      |
|--|----|--------|-----|---|------|
|  <b>Peer-graded Assignment:</b> Test Exercise 1 | 2h | Nov 8  | 12% |  | 100% |
|  <b>Review Your Peers:</b> Test Exercise 1      |    | Nov 11 | 12% |  | --   |

## Multiple Regression

- |  |    |        |     |   |      |
|--|----|--------|-----|---|------|
|  <b>Peer-graded Assignment:</b> Test Exercise 2 | 2h | Nov 15 | 12% |  | 100% |
|  <b>Review Your Peers:</b> Test Exercise 2      |    | Nov 18 | 12% |  | --   |

## Model Specification

- |  |    |        |     |   |     |
|--|----|--------|-----|---|-----|
|  <b>Peer-graded Assignment:</b> Test Exercise 3 | 2h | Nov 22 | 12% |  | 83% |
|  <b>Review Your Peers:</b> Test Exercise 3      |    | Nov 25 | 12% |  | --  |

## Endogeneity

- |  |    |        |     |   |     |
|--|----|--------|-----|---|-----|
|  <b>Peer-graded Assignment:</b> Test Exercise 4 | 2h | Nov 29 | 12% |  | 83% |
|  <b>Review Your Peers:</b> Test Exercise 4      |    | Dec 2  | 12% |  | --  |

## Binary Choice

- |  |    |       |     |   |      |
|--|----|-------|-----|---|------|
|  <b>Peer-graded Assignment:</b> Test Exercise 5 | 2h | Dec 6 | 12% |  | 100% |
|  <b>Review Your Peers:</b> Test Exercise 5      |    | Dec 9 | 12% |  | --   |

## Time Series

- |  |    |        |     |   |      |
|--|----|--------|-----|---|------|
|  <b>Peer-graded Assignment:</b> Test Exercise 6 | 2h | Dec 13 | 12% |  | 100% |
|  <b>Review Your Peers:</b> Test Exercise 6      |    | Dec 16 | 12% |  | --   |

## Case Project

- |   |    |        |     |   |     |
|---|----|--------|-----|---|-----|
|  <b>Peer-graded Assignment:</b> Case Project | 2h | Dec 20 | 28% |  | 88% |
|  <b>Review Your Peers:</b> Case Project      |    | Dec 23 | 28% |  | --  |



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Elasticsearch Essential Training

Course completed on May 15, 2020 • 1 hour 31 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

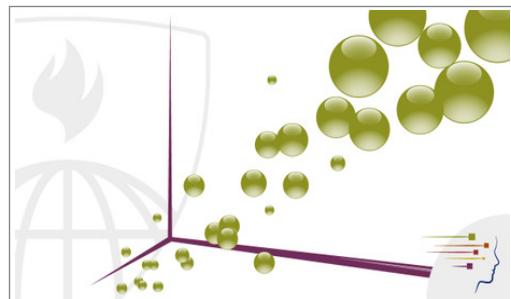
Certificate Id: AUUp4LummfuN1m7oX1qj3HvtWBuSJ

JUNE 18, 2014

# Statement of Accomplishment

## SANDIPAN DEY

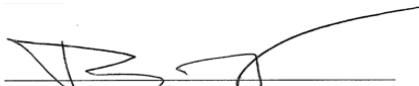
HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### Exploratory Data Analysis

Covers exploratory data summarization techniques that are applied before modeling to inform development of complex models. Topics include plotting in R, principles of constructing graphics, and common multivariate techniques used for high-dimensional data visualization.

---



ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

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JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

---



BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Faster Python Code

Course completed on May 21, 2020 • 2 hours 4 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AcnHgMqktwUr76OpV0rLZZNLMs6p

# Fibonacci Numbers and the Golden Ratio

by The Hong Kong University of Science and Technology



Jeffrey R. Chasnov



Welcome to Fibonacci numbers and the Golden Ratio. More than 800 years ago, Fibonacci posed his now famous puzzle about a growing rabbit population.

▼ More

✓ WEEK 1



✓ WEEK 2



✓ WEEK 3



3/3

Assignments Passed

100%

Final Course Grade

|                            |   | Due          | Weight | Passed | Grade  |
|----------------------------|---|--------------|--------|--------|--|
| Dip your toes in the water |  Quiz: Week 1 14 questions   | Not Verified | Aug 14 | 39%    |  100%   |
| Dive deeper                |  Quiz: Week 2 10 questions  | Not Verified | Aug 21 | 28%    |  100%  |
| Swim with the big fish     |  Quiz: Week 3 12 questions | Not Verified | Aug 28 | 33%    |  100% |



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Figure Drawing: Tonal Rendering

Course completed on Jun 2, 2020 • 1 hour 30 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

*Tanya Staples*  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AbeF1Vo6Q0v7gnFJHUhK-y5cgTxO



## Overview

Week 1

Week 2

Week 3

Week 4

Week 5

## Grades

## Notes

## Discussion Forums

## Messages

## Course Info

## Foundations of Data Science: K-Means Clustering in Python

by University of London &amp; Goldsmiths, University of London

**Congratulations!**

You've successfully completed Foundations of Data Science: K-Means Clustering in Python!

[Rate Course](#)**Instructor's Note**

Welcome to Foundations of Data Science: K-Means Clustering in Python! You're joining thousands of learners currently enrolled in the course. I'm excited to have you in the class and look forward to your contributions to the learning community.

[More](#)**Week 1****Week 2****Week 3****Week 4****Week 5**

Do you want to receive emails from University of London?

 Yes  No

Overview

Grades

Notes

Discussion Forums

Messages

Course Info



| Item   | Status       | Due                    | Weight | Grade |
|--|--------------|------------------------|--------|-------|
| Week 1 Summative Assessment Quiz             | Passed       | Apr 12<br>12:29 PM IST | 5%     | 100%  |
| Use Jupyter Notebooks                        |              |                        | 10%    | 100%  |
| ✓ Submit your assignment                     | Passed       | Apr 19<br>12:29 PM IST |        |       |
| ✓ Review 3 peers' assignments.               | 3/3 reviewed | Apr 22<br>12:29 PM IST |        |       |
| Week 2 Summative Assessment Quiz             | Passed       | Apr 19<br>12:29 PM IST | 5%     | 100%  |
| Week 3 Summative Assessment Quiz             | Passed       | Apr 26<br>12:29 PM IST | 5%     | 100%  |
| Week 4 Summative Assessment Quiz             | Passed       | May 3<br>12:29 PM IST  | 5%     | 100%  |
| Create a Labelled Plot of the Happiness Data |              |                        | 10%    | 100%  |
| ✓ Submit your assignment                     | Passed       | May 3<br>12:29 PM IST  |        |       |
| ✓ Review 3 peers' assignments.               | 3/3 reviewed | May 6<br>12:29 PM IST  |        |       |
| Exploratory Data Analysis                    |              |                        | 10%    | 100%  |
| ✓ Submit your assignment                     | Passed       | May 10<br>12:29 PM IST |        |       |
| ✓ Review 2 peers' assignments.               | 2/2 reviewed | May 13<br>12:29 PM IST |        |       |
| Clustering                                   |              |                        | 10%    | 100%  |
| ✓ Submit your assignment                     | Passed       | May 10<br>12:29 PM IST |        |       |
| ✓ Review 2 peers' assignments.               | 2/2 reviewed | May 13<br>12:29 PM IST |        |       |
| Your Report                                  |              |                        | 35%    | 100%  |
| ✓ Submit your assignment                     | Passed       | May 10<br>12:29 PM IST |        |       |
| ✓ Review 3 peers' assignments.               | 3/3 reviewed | May 13<br>12:29 PM IST |        |       |
| Week 5 Summative Assessment Quiz             | Passed       | May 10<br>12:29 PM IST | 5%     | 100%  |



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Functional Programming with Python

Course completed on May 26, 2020 • 1 hour 45 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AZhqxbY8-VzM3tvP7pBDzRdcFt9v

# Fundamentals of Digital Image and Video Processing

by Northwestern University



Aggelos K. Katsaggelos



Welcome to Fundamentals of Image and Video Processing – we are incredibly excited that you will be joining us for the next 12 weeks as we le

▼ More

## Congratulations!

You've successfully completed **Fundamentals of Digital Image and Video Processing**



✓ WEEK 1 ▼

✓ WEEK 2 ▼

✓ WEEK 3 ▼

✓ WEEK 4 ▼

✓ WEEK 5 ▼

✓ WEEK 6 ▼

✓ WEEK 7 ▼

✓ WEEK 8 ▼

✓ WEEK 9 ▼

✓ WEEK 10 ▼

✓ WEEK 11 ▼

✓ WEEK 12 ▼



Course Home

## Grades

Discussion Forums

Course Info

12/12

Assignments Passed

98.8%

Final Course Grade

|   |              | Due    | Weight | Passed | Grade |
|---|--------------|--------|--------|--------|-------|
| Introduction to Image and Video Processing  |              |        |        |        |       |
|  Quiz: Homework 1    | 8 questions  | Mar 13 | 8%     | ✓      | 100%  |
| Signals and Systems   |              |        |        |        |       |
|  Quiz: Homework 2    | 8 questions  | Mar 20 | 8%     | ✓      | 100%  |
| Fourier Transform and Sampling  |              |        |        |        |       |
|  Quiz: Homework 3    | 8 questions  | Mar 27 | 8%     | ✓      | 100%  |
| Motion Estimation   |              |        |        |        |       |
|  Quiz: Homework 4    | 9 questions  | Apr 3  | 8%     | ✓      | 100%  |
| Image Enhancement   |              |        |        |        |       |
|  Quiz: Homework 5    | 9 questions  | Apr 10 | 8%     | ✓      | 100%  |
| Image Recovery: Part 1  |              |        |        |        |       |
|  Quiz: Homework 6    | 6 questions  | Apr 17 | 8%     | ✓      | 100%  |
| Image Recovery : Part 2   |              |        |        |        |       |
|  Quiz: Homework 7   | 7 questions  | Apr 24 | 8%     | ✓      | 100%  |
| Lossless Compression  |              |        |        |        |       |
|  Quiz: Homework 8  | 7 questions  | May 1  | 8%     | ✓      | 100%  |
| Image Compression   |              |        |        |        |       |
|  Quiz: Homework 9  | 7 questions  | May 8  | 8%     | ✓      | 100%  |
| Video Compression   |              |        |        |        |       |
|  Quiz: Homework 10 | 8 questions  | May 15 | 8%     | ✓      | 100%  |
| Image and Video Segmentation  |              |        |        |        |       |
|  Quiz: Homework 11 | 10 questions | May 22 | 10%    | ✓      | 100%  |
| Sparsity  |              |        |        |        |       |
|  Quiz: Homework 12 | 8 questions  | May 29 | 10%    | ✓      | 88%   |

MARCH 26, 2013

# Online Course Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



### Game Theory

This course on Game Theory covers notions of equilibrium, dominance, normal and extensive form games, and games of complete and incomplete information, as well as an introduction to cooperative games.



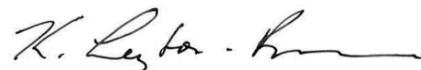
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MATTHEW O. JACKSON  
PROFESSOR OF ECONOMICS, STANFORD UNIVERSITY



---

YOAV SHOHAM  
PROFESSOR OF COMPUTER SCIENCE, STANFORD  
UNIVERSITY



---

KEVIN LEYTON-BROWN  
PROFESSOR  
COMPUTER SCIENCE, UNIVERSITY OF BRITISH  
COLUMBIA



3 Courses

Build Basic Generative  
Adversarial Networks  
(GANs)

Build Better Generative  
Adversarial Networks  
(GANs)

Apply Generative  
Adversarial Networks  
(GANs)



Nov 7, 2020

**Sandipan Dey**

has successfully completed the online, non-credit Specialization

# Generative Adversarial Networks (GANs)

Congratulations! You have completed all 3 courses of Generative Adversarial Networks - a DeepLearning.AI Specialization. As part of this Specialization, you have learned the classical machine learning skills and the state-of-the-art deep learning techniques needed to build GANs models. You are now equipped to design applications that perform image generation and image-to-image translation using GANs! These, and other generative applications, are going to be at the forefront of the coming transformation to an AI-powered future.



Sharon Zhou  
Course Instructor  
DeepLearning.AI

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

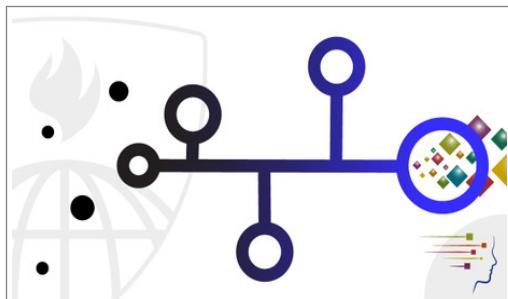
Verify this certificate at:  
[coursera.org/verify/specialization/MCKNT2ZEWA7F](https://coursera.org/verify/specialization/MCKNT2ZEWA7F)

MAY 11, 2014

# Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### Getting and Cleaning Data

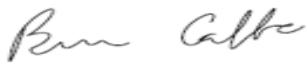
This course covers obtaining data from the web, APIs, databases, and colleagues in various formats, as well as the basics of cleaning and “tidying” data. It also covers the components of a complete data set: raw data, processing instructions, codebooks, & processed data.



JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



Apr 20, 2021

## Sandipan Dey

has successfully completed

### Getting started with TensorFlow 2

an online non-credit course authorized by Imperial College London and offered through Coursera

A handwritten signature in black ink that reads "K.webster".

Kevin Webster  
Senior Teaching Fellow in Statistics  
Faculty of Natural Sciences, Department of Mathematics

### COURSE CERTIFICATE



Verify at [coursera.org/verify/ZDNQS8ESLRCL](https://coursera.org/verify/ZDNQS8ESLRCL)

Coursera has confirmed the identity of this individual and their participation in the course.

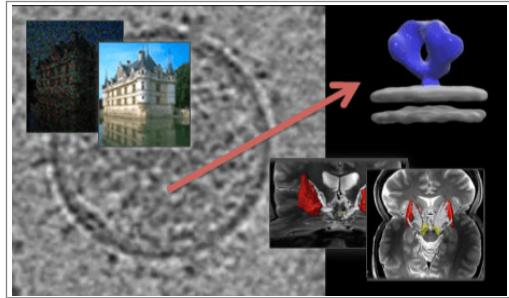
MARCH 18, 2013

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED AN ONLINE NON-CREDIT COURSE OFFERED BY DUKE UNIVERSITY.



### Image and video processing: From Mars to Hollywood with a stop at the hospital

This course starts with an introduction to basic and critical components in image and video processing and continues with very advanced material. It is considered an advanced undergraduate or early graduate class.



---

GUILLERMO SAPIRO  
EDMUND T. PRATT, JR. SCHOOL DISTINGUISHED PROFESSOR OF  
ELECTRICAL AND COMPUTER ENGINEERING



09/15/2017

## Sandipan Dey

has successfully completed

Improving Deep Neural Networks:  
Hyperparameter tuning, Regularization and  
Optimization

an online non-credit course authorized by deeplearning.ai and offered through  
Coursera

A handwritten signature in blue ink that appears to read "Andrew Ng".

---

Adjunct Professor Andrew Ng  
Computer Science

## COURSE CERTIFICATE



Verify at [coursera.org/verify/FCD6VTNZP58Y](https://coursera.org/verify/FCD6VTNZP58Y)

Coursera has confirmed the identity of this individual and  
their participation in the course.

# Inferential Statistics

by University of Amsterdam



Welcome to Inferential Statistics! Thanks for taking this fourth course in the Specialization on Methods and Statistics in the Social Sciences. It's

▼ More

## Congratulations!

You've successfully completed Course 4 of 5: **Inferential Statistics**.

Keep going!



✓ WEEK 1



✓ WEEK 2



✓ WEEK 3



✓ WEEK 4



✓ WEEK 5



✓ WEEK 6



✓ WEEK 7





Like this course? Become an expert by joining the [Methods and Statistics in Social Sciences Specialization](#).

[Upgrade](#)[Course Home](#)

13/13

97.4%

Assignments Passed

Final Course Grade

**Grades**[Discussion Forums](#)[Course Info](#)

## Comparing two groups

- |   |                                     | Due   | Weight | Passed | Grade |
|---|-------------------------------------|-------|--------|--------|-------|
|  Quiz:   | Comparing two groups · 18 questions | Mar 6 | 6%     | ✓      | 100%  |
|  R lab - | Comparing two groups · 1h           | Mar 6 | 6%     | ✓      | 100%  |

## Categorical association

- |   |  |        |    |   |      |
|---|--|--------|----|---|------|
|  Quiz:   | Categorical association · 15 questions | Mar 13 | 6% | ✓ | 100% |
|  R lab - | Categorical association · 1h           | Mar 13 | 6% | ✓ | 100% |

## Simple regression

- |   |                                  |        |    |   |      |
|---|----------------------------------|--------|----|---|------|
|  Quiz:   | Simple regression · 17 questions | Mar 20 | 6% | ✓ | 100% |
|  R lab - | Simple regression · 1h           | Mar 20 | 6% | ✓ | 100% |

## Multiple regression

- |   |                                    |        |    |   |      |
|---|------------------------------------|--------|----|---|------|
|  Quiz:    | Multiple regression · 21 questions | Mar 27 | 6% | ✓ | 95%  |
|  R lab - | Multiple regression · 1h           | Mar 27 | 6% | ✓ | 100% |

## Analysis of variance

- |   |                                     |       |    |   |      |
|---|-------------------------------------|-------|----|---|------|
|  Quiz:   | Analysis of variance · 16 questions | Apr 3 | 6% | ✓ | 100% |
|  R lab - | Analysis of variance · 1h           | Apr 3 | 6% | ✓ | 100% |

## Non-parametric tests

- |   |                                     |        |    |   |      |
|---|-------------------------------------|--------|----|---|------|
|  Quiz:   | Non-parametric tests · 15 questions | Apr 10 | 6% | ✓ | 93%  |
|  R lab - | Non-parametric tests · 1h           | Apr 10 | 6% | ✓ | 100% |

## Exam time!

- |   |                           |        |     |   |     |
|---|---------------------------|--------|-----|---|-----|
|  Quiz: | Final exam · 29 questions | Apr 17 | 28% | ✓ | 93% |
|---|---------------------------|--------|-----|---|-----|



CERTIFICATE OF COMPLETION

# Sandipan Dey

HAS SUCCESSFULLY COMPLETED THE COURSE

## Intro to Deep Learning

---

ON OCTOBER 13, 2020

A handwritten signature in black ink that reads "Ryan Holbrook".

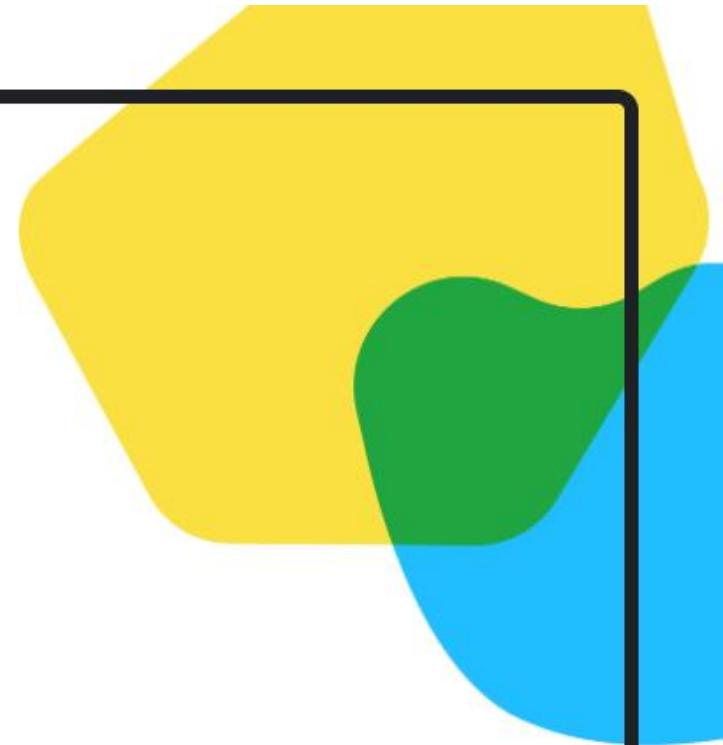
---

RYAN HOLBROOK, KAGGLE INSTRUCTOR

A handwritten signature in black ink that reads "Alexis Cook".

---

ALEXIS COOK, HEAD OF KAGGLE LEARN





HIGHER SCHOOL OF ECONOMICS  
NATIONAL RESEARCH UNIVERSITY

Aug 31, 2020

# Sandipan Dey

has successfully completed

## Introduction to Deep Learning

an online non-credit course authorized by HSE University and offered through Coursera

Alexander Parin, Ekaterina Lobacheva,  
Kazeev, Nikita, Andrei Zimovnov,  
E. Sokolov

Alexander Parin, Ekaterina Lobacheva,  
Nikita Kazeev, Andrei Zimovnov,  
Evgeny Sokolov

## COURSE CERTIFICATE



Verify at [coursera.org/verify/G6BDX34GSKJS](https://coursera.org/verify/G6BDX34GSKJS)

Coursera has confirmed the identity of this individual and their participation in the course.

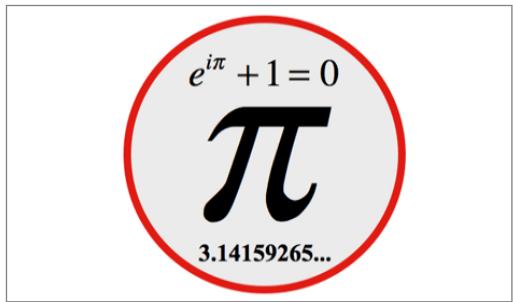
DECEMBER 14, 2014

# Online Course Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



### Introduction to Mathematical Thinking

The eight/ten week course focused on the development of mathematical thinking skills, and comprised lectures, quizzes, ungraded assignments, and graded Problem Sets. The topics were logical combinatorics; implication; quantifiers; proofs; number theory; real analysis.

A handwritten signature in black ink that reads "Keith Devlin".

KEITH DEVLIN, PH.D., D.S.C.  
STANFORD UNIVERSITY

PLEASE NOTE: SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS PARTICIPANT WAS ENROLLED AS A STUDENT AT STANFORD UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A STANFORD UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE PARTICIPANT.

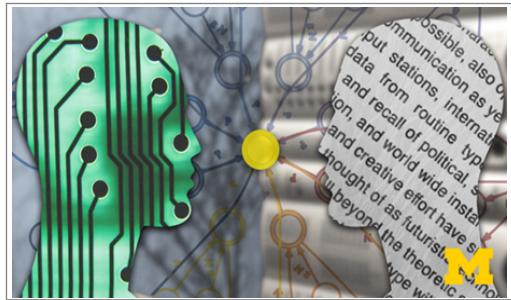
JANUARY 06, 2016

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED



### Introduction to Natural Language Processing

This University of Michigan course covers Linguistics, Language Modeling, Part of Speech Tagging, Syntax, Constituent and Dependency Parsing, Semantics, Word Sense Disambiguation, Discourse and Dialogue, Machine Translation, Question Answering, and Text Summarization.

*Dragomir Radev*

---

PROF. DRAGOMIR RADEV  
PROFESSOR OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE, COLLEGE OF ENGINEERING  
PROFESSOR OF INFORMATION, SCHOOL OF INFORMATION  
PROFESSOR OF LINGUISTICS, COLLEGE OF LITERATURE, SCIENCE AND THE ARTS  
UNIVERSITY OF MICHIGAN

PLEASE NOTE: THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT THE UNIVERSITY OF MICHIGAN. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT THE UNIVERSITY OF MICHIGAN IN ANY WAY. IT DOES NOT CONFER A UNIVERSITY OF MICHIGAN GRADE; IT DOES NOT CONFER UNIVERSITY OF MICHIGAN CREDIT; IT DOES NOT CONFER A UNIVERSITY OF MICHIGAN DEGREE; AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.

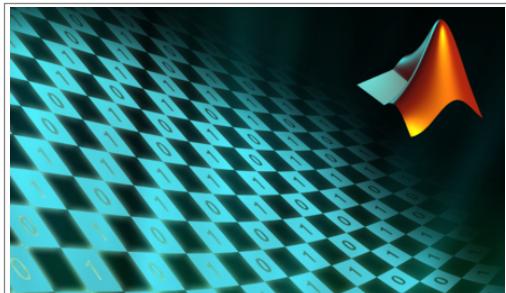
JUNE 24, 2015

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED VANDERBILT UNIVERSITY'S ONLINE OFFERING OF



### Introduction to Programming with MATLAB

This course teaches computer programming to those with little to no previous experience. We use the programming system and language called MATLAB because it is easy to learn, versatile, and very useful for engineers and other professionals.

*Ak Ledeczi*

---

AKOS LEDECZI  
ASSOCIATE PROFESSOR, COMPUTER ENGINEERING

*R. Tairas*

---

ROBERT TAIRAS, PH.D.  
ASSISTANT PROFESSOR OF THE PRACTICE OF  
COMPUTER SCIENCE  
DEPARTMENT OF ELECTRICAL ENGINEERING AND  
COMPUTER SCIENCE, VANDERBILT UNIVERSITY

*Mike Fitzpatrick*

---

MIKE FITZPATRICK  
PROFESSOR EMERITUS  
COMPUTER SCIENCE, COMPUTER ENGINEERING,  
ELECTRICAL ENGINEERING, NEUROSURGERY, AND  
RADIOLOGY,



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Introduction to Quantum Computing

Course completed on Jun 3, 2020 • 1 hour 25 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

*Tanya Stanley*  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AUyvNDqgto8w9x2Zcsq4qd9uJJQL



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Introduction to Quantum Cryptography

Course completed on Jun 6, 2020 • 32 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AS1WYoeiL-3pEoe7wL2Uu4CgrVvh

JANUARY 07, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF MINNESOTA'S ONLINE OFFERING OF



## Introduction to Recommender Systems

This graduate course covers a broad set of topics on recommender algorithms (non-personalized; content-based; user-user, item-item, and matrix-factorization collaborative), evaluation, data, and user experience and design. Distinction includes extensive programming.

DISTINGUISHED MCKNIGHT PROFESSOR AND  
DISTINGUISHED UNIVERSITY TEACHING PROFESSOR  
ASSOCIATE DEPARTMENT HEAD  
DEPARTMENT OF COMPUTER SCIENCE AND  
ENGINEERING  
UNIVERSITY OF MINNESOTA

INSTRUCTOR

THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT THE UNIVERSITY OF MINNESOTA. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT THE UNIVERSITY OF MINNESOTA IN ANY WAY. IT DOES NOT CONFER A UNIVERSITY OF MINNESOTA GRADE; IT DOES NOT CONFER UNIVERSITY OF MINNESOTA CREDIT; IT DOES NOT CONFER A UNIVERSITY OF MINNESOTA DEGREE; AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.

Statement of Completion for Sandipan Dey, email address: [sandipan.dey@gmail.com](mailto:sandipan.dey@gmail.com)

Dear Sandipan:

Congratulations! You have successfully completed the online non-credit offering of *Learning from Data* (introductory machine learning) taught by Dr. Yaser S. Abu-Mostafa, Professor of Electrical Engineering and Computer Science at the California Institute of Technology (Caltech). Your total score is **94** out of 100 which places you in the top **2.43%** of our reference database of participants.

Best regards,

<http://work.caltech.edu/telecourse>

- The statement of completion does not affirm that the student was enrolled at Caltech.
- It does not confer a university grade, course credit, or degree.
- It does not verify the identity of the student.
- Some online offerings may draw on material from courses taught on campus, but they are not equivalent to on-campus courses.



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

# Learning Microsoft Cognitive Services for Developers

Course completed on Jun 8, 2020 • 1 hour 42 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: ARUiJA7cNSbwPaWsqMRL56tHwqXi



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Learning REST APIs

Course completed on Jun 11, 2020 • 1 hour 8 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AUNRM-tnzNS0Kk4VXA-XmApI6vYS



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Learning the R Tidyverse

Course completed on Jun 2, 2020 • 3 hours 44 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

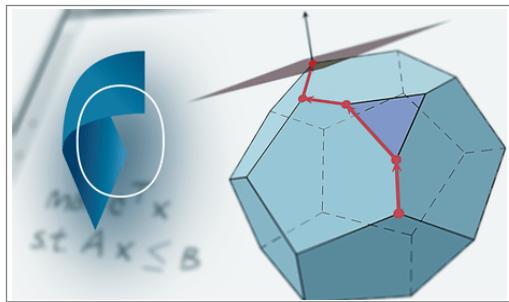
Certificate Id: AdTmFrgiXnX-6z5Att8eK1HsDqDN

MAY 16, 2013

# Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE'S ONLINE OFFERING OF



### Linear and Discrete Optimization

This advanced undergraduate course treats basic principles on linear programming like the simplex algorithm, its complexity, and duality. Furthermore it gives an introduction on discrete optimization via bipartite matchings, shortest paths and the primal/dual method.

*Friedrich Eisenbrand*

---

PROFESSOR FRIEDRICH EISENBRAND  
EPFL

DISCLAIMER : THIS ONLINE OFFERING DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE. THIS DOCUMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE STUDENT IN ANY WAY; IT DOES NOT CONFER A ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE CREDIT; IT DOES NOT CONFER A ECOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE DEGREE OR CERTIFICATE; AND IT DOES NOT VERIFY THE IDENTITY OF THE INDIVIDUAL WHO TOOK THE COURSE.

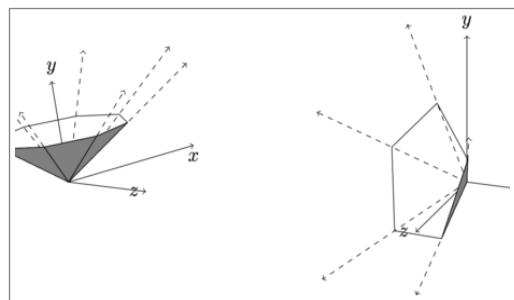
JANUARY 08, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE UNIVERSITY OF COLORADO BOULDER'S ONLINE OFFERING  
OF



### Linear and Integer Programming

The course introduces the fundamentals of optimization through linear and integer programming. Students learn the material by solving problems using existing solvers and then writing their own solvers to obtain an in-depth knowledge of the techniques involved.

SRIRAM SANKARANARAYANAN, PH.D.  
DEPARTMENT OF COMPUTER SCIENCE  
UNIVERSITY OF COLORADO BOULDER

SHALOM D. RUBEN, PH.D.  
MECHANICAL ENGINEERING DEPARTMENT  
UNIVERSITY OF COLORADO BOULDER



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Machine Learning & AI: Advanced Decision Trees

Course completed on May 27, 2020 • 1 hour 16 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

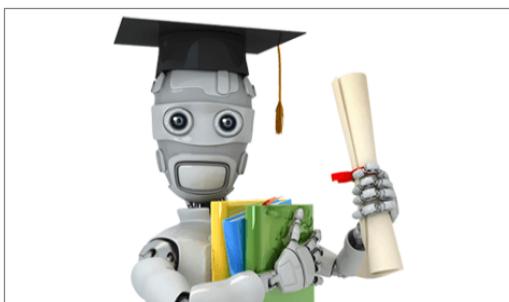
Certificate Id: AdW0kkJti1jtzpuQ7xsmo30yVEA

AUGUST 13, 2013

# Online Course Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



### Machine Learning

Congratulations! You have successfully completed the online Machine Learning course ([ml-class.org](http://ml-class.org)). To successfully complete the course, students were required to watch lectures, review questions and complete programming assignments.

A handwritten signature in blue ink that reads "Andrew Ng".

---

ASSOCIATE PROFESSOR ANDREW NG  
COMPUTER SCIENCE DEPARTMENT  
STANFORD UNIVERSITY

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LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

# Machine Learning and AI Foundations: Recommendations

Course completed on Jun 9, 2020 • 58 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

  
Tanya Stanley  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AS4rqNn3ZeVQ\_hkPUraW9oIXzVUP

# Machine Learning: Classification

by University of Washington



Welcome to Machine Learning: Classification! You're joining thousands of learners currently enrolled in the course. I'm excited to have you in!

▼ More

## Congratulations!

You've successfully completed Course 3 of 4: Machine Learning: Classification

Keep going!



✓ WEEK 1



✓ WEEK 2



✓ WEEK 3



✓ WEEK 4



✓ WEEK 5



✓ WEEK 6



✓ WEEK 7



|  | Due          | Weight | Passed | Grade  |
|--|--------------|--------|--------|--------|
| <b>Linear Classifiers &amp; Logistic Regression</b>  |              |        |        |        |
|  <b>Quiz:</b> Linear Classifiers & Logistic Regression                      | 5 questions  | Mar 13 | 4%     | ✓ 100% |
|  <b>Quiz:</b> Predicting sentiment from product reviews                     | 12 questions | Mar 13 | 6%     | ✓ 100% |
| <b>Learning Linear Classifiers</b>   |              |        |        |        |
|  <b>Quiz:</b> Learning Linear Classifiers                                   | 6 questions  | Mar 20 | 4%     | ✓ 100% |
|  <b>Quiz:</b> Implementing logistic regression from scratch                 | 8 questions  | Mar 20 | 7%     | ✓ 100% |
| <b>Overfitting &amp; Regularization in Logistic Regression</b>   |              |        |        |        |
|  <b>Quiz:</b> Overfitting & Regularization in Logistic Regression           | 8 questions  | Mar 20 | 4%     | ✓ 100% |
|  <b>Quiz:</b> Logistic Regression with L2 regularization                    | 8 questions  | Mar 20 | 7%     | ✓ 100% |
| <b>Decision Trees</b>  |              |        |        |        |
|  <b>Quiz:</b> Decision Trees  | 11 questions | Mar 27 | 4%     | ✓ 100% |
|  <b>Quiz:</b> Identifying safe loans with decision trees                    | 7 questions  | Mar 27 | 6%     | ✓ 100% |
|  <b>Quiz:</b> Implementing binary decision trees                            | 7 questions  | Mar 27 | 6%     | ✓ 100% |
| <b>Preventing Overfitting in Decision Trees</b>  |              |        |        |        |
|  <b>Quiz:</b> Preventing Overfitting in Decision Trees                      | 11 questions | Apr 3  | 4%     | ✓ 100% |
|  <b>Quiz:</b> Decision Trees in Practice                                    | 14 questions | Apr 3  | 7%     | ✓ 100% |
| <b>Handling Missing Data</b>   |              |        |        |        |
|  <b>Quiz:</b> Handling Missing Data                                       | 7 questions  | Apr 3  | 4%     | ✓ 100% |
| <b>Boosting</b>  |              |        |        |        |
|  <b>Quiz:</b> Exploring Ensemble Methods                                  | 9 questions  | Apr 10 | 4%     | ✓ 100% |
|  <b>Quiz:</b> Boosting  | 11 questions | Apr 10 | 6%     | ✓ 100% |
|  <b>Quiz:</b> Boosting a decision stump                                   | 5 questions  | Apr 10 | 6%     | ✓ 100% |
| <b>Precision-Recall</b>  |              |        |        |        |
|  <b>Quiz:</b> Precision-Recall  | 9 questions  | Apr 17 | 4%     | ✓ 100% |
|  <b>Quiz:</b> Exploring precision and recall                              | 13 questions | Apr 17 | 6%     | ✓ 100% |
| <b>Scaling to Huge Datasets &amp; Online Learning</b>  |              |        |        |        |
|  <b>Quiz:</b> Scaling to Huge Datasets & Online Learning                  | 10 questions | Apr 24 | 4%     | ✓ 100% |
|  <b>Quiz:</b> Training Logistic Regression via Stochastic Gradient Ascent | 12 questions | Apr 24 | 7%     | ✓ 100% |

# Machine Learning Foundations: A Case Study Approach

by University of Washington



X

Welcome to *Machine Learning Foundations: A Case Study Approach*! By joining this course, you've taken a first step in becoming a machine learning expert.

▼ More

## Congratulations!

You've successfully completed Course 1 of 4: **Machine Learning Foundations: A Case Study Approach**

Keep going!



### WEEK 1

Estimated time: 1h 16m

Welcome

Videos 56 min left



Readings 20 min left

Nothing due

### ✓ WEEK 2

▼

### ✓ WEEK 3

▼

### ✓ WEEK 4

▼

### ✓ WEEK 5

▼

### ✓ WEEK 6

▼

10/10

Assignments Passed

100%

Final Course Grade

## Regression: Predicting House Prices

|   |             | Due    | Weight | Passed | Grade |
|---|-------------|--------|--------|--------|-------|
|  Quiz: Regression              | 9 questions | Oct 25 | 6%     | ✓      | 100%  |
|  Quiz: Predicting house prices | 3 questions | Oct 25 | 14%    | ✓      | 100%  |

## Classification: Analyzing Sentiment

|   |              | Due   | Weight | Passed | Grade |
|---|--------------|-------|--------|--------|-------|
|  Quiz: Classification              | 7 questions  | Nov 1 | 6%     | ✓      | 100%  |
|  Quiz: Analyzing product sentiment | 11 questions | Nov 1 | 14%    | ✓      | 100%  |

## Clustering and Similarity: Retrieving Documents

|  |             | Due   | Weight | Passed | Grade |
|--|-------------|-------|--------|--------|-------|
|  Quiz: Clustering and Similarity      | 6 questions | Nov 8 | 6%     | ✓      | 100%  |
|  Quiz: Retrieving Wikipedia articles | 9 questions | Nov 8 | 14%    | ✓      | 100%  |

## Recommending Products

|   |             | Due    | Weight | Passed | Grade |
|---|-------------|--------|--------|--------|-------|
|  Quiz: Recommender Systems | 9 questions | Nov 15 | 6%     | ✓      | 100%  |
|  Quiz: Recommending songs  | 3 questions | Nov 15 | 14%    | ✓      | 100%  |

## Deep Learning: Searching for Images

|   |             | Due    | Weight | Passed | Grade |
|---|-------------|--------|--------|--------|-------|
|  Quiz: Deep Learning                     | 6 questions | Nov 22 | 6%     | ✓      | 100%  |
|  Quiz: Deep features for image retrieval | 7 questions | Nov 22 | 14%    | ✓      | 100%  |



10/30/2015

## Sandipan Dey

has successfully completed

### Machine Learning Foundations: A Case Study Approach

a MOOC from the University of Washington and offered through Coursera

Carlos Guestrin  
Amazon Professor of Machine Learning  
Computer Science and Engineering

Emily Fox  
Amazon Professor of Machine Learning  
Statistics

## COURSE CERTIFICATE



Verify at [coursera.org/verify/LMRBXGWDHN7Y](https://coursera.org/verify/LMRBXGWDHN7Y)  
Coursera has confirmed the identity of this individual and  
their participation in the course.

# Statement of Accomplishment

December 31, 2011

Dear Sandipan Dey (sandipan.dey@gmail.com),

Congratulations! You have successfully completed the online Machine Learning course (ml-class.org), offered October through December, 2011. To successfully complete this online course, students were required to watch lectures, complete review questions, and work through programming exercises. Your score on these components were as follows:

Review Questions: 80 out of a maximum of 80

Programming Exercises: 800 out of a maximum of 800

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew Ng".

Andrew Ng

Disclaimer: This online offering of Machine Learning does not reflect the entire curriculum offered to students enrolled at Stanford University. This document does not affirm that you were enrolled as a Stanford student in any way; it does not confer a Stanford grade; it does not confer Stanford credit; it does not confer a Stanford degree or a certificate; and it does not verify the identity of the individual who took the course.

# Machine Learning: Regression

by University of Washington



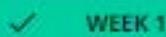
Welcome to Regression, the second course in the University of Washington Machine Learning Specialization on Coursera! By

▼ More

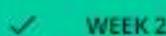
## Congratulations!

You've successfully completed Course 2 of 4: **Machine Learning: Regression**

Keep going!



WEEK 1



WEEK 2



WEEK 3



WEEK 4



WEEK 5



WEEK 6



Like this course? Become an expert by joining the [Machine Learning Specialization](#).[Upgrade](#)

Course Home

**Grades**

Discussion Forums

Course Info

15/15

Assignments Passed

100%

Final Course Grade

## Simple Linear Regression

- |   |  | Due   | Weight | Passed  | Grade |
|---|--|-------|--------|---|-------|
|  Quiz: | Simple Linear Regression · 7 questions                                 | Dec 6 | 3%     |  | 100%  |
|  Quiz: | Fitting a simple linear regression model on housing data · 4 questions | Dec 6 | 7%     |  | 100%  |

## Multiple Regression

- |   |   |        |    |   |      |
|---|---|--------|----|---|------|
|  Quiz: | Multiple Regression · 9 questions   | Dec 13 | 6% |  | 100% |
|  Quiz: | Exploring different multiple regression models for house price prediction · 8 questions | Dec 13 | 7% |  | 100% |
|  Quiz: | Implementing gradient descent for multiple regression · 5 questions                     | Dec 13 | 7% |  | 100% |

## Assessing Performance

- |   |  |        |    |   |      |
|---|--|--------|----|---|------|
|  Quiz: | Assessing Performance · 13 questions               | Dec 20 | 6% |  | 100% |
|  Quiz: | Exploring the bias-variance tradeoff · 4 questions | Dec 20 | 9% |  | 100% |

## Ridge Regression

- |   |  |        |    |   |      |
|---|--|--------|----|---|------|
|  Quiz: | Ridge Regression · 9 questions   | Dec 27 | 6% |  | 100% |
|  Quiz: | Observing effects of L2 penalty in polynomial regression · 7 questions | Dec 27 | 7% |  | 100% |
|  Quiz: | Implementing ridge regression via gradient descent · 8 questions       | Dec 27 | 7% |  | 100% |

## Feature Selection &amp; Lasso

- |   |   |       |    |   |      |
|---|---|-------|----|---|------|
|  Quiz: | Feature Selection and Lasso · 7 questions                 | Jan 3 | 6% |  | 100% |
|  Quiz: | Using LASSO to select features · 6 questions              | Jan 3 | 7% |  | 100% |
|  Quiz: | Implementing LASSO using coordinate descent · 8 questions | Jan 3 | 7% |  | 100% |

## Nearest Neighbors &amp; Kernel Regression

- |   |  |        |    |   |      |
|---|--|--------|----|---|------|
|  Quiz: | Nearest Neighbors & Kernel Regression · 7 questions                        | Jan 10 | 6% |  | 100% |
|  Quiz: | Predicting house prices using k-nearest neighbors regression · 8 questions | Jan 10 | 9% |  | 100% |

UC San Diego

# Machine Learning With Big Data (2015)

by University of California, San Diego

## Course Home

[Week 1](#)[Week 2](#)[Week 3](#)[Week 4](#)

## Grades

## Discussion Forums

[!\[\]\(51baf887508499c9f2493c3638126001\_img.jpg\) WEEK 1](#)[!\[\]\(783c3f3660a33e18c84ecd7d12da8430\_img.jpg\) WEEK 2](#)[!\[\]\(b0254422a6a82852e4e0758393971c68\_img.jpg\) WEEK 3](#)[!\[\]\(7869f3aff37d93ba45b490a9e87fc74b\_img.jpg\) WEEK 4](#)

## Congratulations!

You've successfully completed Machine Learning With Big Data (2015).





Course Home

14/14

Assignments Passed

100%

Final Course Grade

**Grades**

Discussion Forums

## Machine Learning Foundations

Course Info

|  |              | Due    | Weight | Passed | Grade |
|--|--------------|--------|--------|--------|-------|
|  <b>Quiz:</b> Machine Learning with Big Data Review | 7 questions  | Jan 10 | 4%     | ✓      | 100%  |
|  <b>Quiz:</b> Machine Learning Foundations Quiz     | 10 questions | Jan 10 | 4%     | ✓      | 100%  |
|  <b>Quiz:</b> Data Preparation Quiz                 | 5 questions  | Jan 10 | 4%     | ✓      | 100%  |

## Classification Tools and Techniques

|  |             |        |     |   |      |
|--|-------------|--------|-----|---|------|
|  <b>Quiz:</b> Classification Algorithms - Naive Bayes Review    | 5 questions | Jan 17 | 5%  | ✓ | 100% |
|  <b>Quiz:</b> Naive Bayes Assignment                            | 3 questions | Jan 17 | 10% | ✓ | 100% |
|  <b>Quiz:</b> Classification Algorithms - Decision Trees Review | 7 questions | Jan 17 | 5%  | ✓ | 100% |
|  <b>Quiz:</b> Decision Tree Assignment                          | 5 questions | Jan 17 | 11% | ✓ | 100% |
|  <b>Quiz:</b> Running Classification in Spark                   | 6 questions | Jan 17 | 11% | ✓ | 100% |

## Association Rule Learning

|   |             |        |     |   |      |
|---|-------------|--------|-----|---|------|
|  <b>Quiz:</b> Association Rule Learning Review     | 5 questions | Jan 24 | 5%  | ✓ | 100% |
|  <b>Quiz:</b> Association Rule Learning Part 2     | 5 questions | Jan 24 | 4%  | ✓ | 100% |
|  <b>Quiz:</b> Association Rule Learning Assignment | 4 questions | Jan 24 | 12% | ✓ | 100% |

## Clustering Analysis

|   |             |        |     |   |      |
|---|-------------|--------|-----|---|------|
|  <b>Quiz:</b> Clustering Review                  | 7 questions | Jan 31 | 5%  | ✓ | 100% |
|  <b>Quiz:</b> Clustering Assignment in KNIME     | 3 questions | Jan 31 | 10% | ✓ | 100% |
|  <b>Quiz:</b> Running Kmeans Clustering in Spark | 3 questions | Jan 31 | 10% | ✓ | 100% |

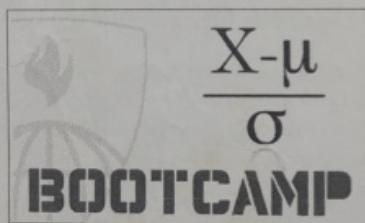
SEPTEMBER 17, 2013

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### Mathematical Biostatistics Boot Camp 1

This course puts forward key mathematical and statistical topics to help students understand biostatistics at a deeper level. Successful students have a basic understanding of the goals, assumptions, benefits and negatives of probability modeling in the medical sciences.

*Brian Caffo*

BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS  
JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH

PLEASE NOTE: THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT THE JOHNS HOPKINS UNIVERSITY. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT THE JOHNS HOPKINS UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A JOHNS HOPKINS UNIVERSITY GRADE; IT DOES NOT CONFER JOHNS HOPKINS STUDENT CREDIT; IT DOES NOT CONFER A JOHNS HOPKINS UNIVERSITY DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE



This is to certify that

**Sandipan Dey**

successfully completed and received a passing grade in

# **Mathematical Optimization for Business Problems**

(CP0101EN, provided by Big Data University)

A course on cognitiveclass.ai  
Powered by IBM Developer Skills Network.

Issued by  
**Cognitive Class**

**January 15, 2020**

Authenticity of this certificate can be validated by going to:

<https://courses.cognitiveclass.ai/certificates/0ef8d92b57394b7a9a1b8ab5a91bebcb>



03/08/2018

## Sandipan Dey

has successfully completed

### Mathematics for Machine Learning: Linear Algebra

an online non-credit course authorized by Imperial College London and offered through Coursera

Two handwritten signatures in black ink. The first signature on the left appears to be "David Dye". The second signature on the right appears to be "Samuel J. Cooper".

David Dye and Samuel J. Cooper

## COURSE CERTIFICATE



Verify at [coursera.org/verify/542NSQQ4H7TW](https://coursera.org/verify/542NSQQ4H7TW)

Coursera has confirmed the identity of this individual and their participation in the course.



03/07/2018

## Sandipan Dey

has successfully completed

### Mathematics for Machine Learning: Multivariate Calculus

an online non-credit course authorized by Imperial College London and offered through Coursera

Two handwritten signatures in black ink. The first signature on the left appears to be "David Dye". The second signature on the right appears to be "Samuel J. Cooper".

David Dye and Samuel J. Cooper

## COURSE CERTIFICATE



Verify at [coursera.org/verify/WGGFLGHCDFUT](https://coursera.org/verify/WGGFLGHCDFUT)

Coursera has confirmed the identity of this individual and their participation in the course.

DECEMBER 03, 2014

# Online Course Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



### Mining Massive Datasets

Topics include MapReduce, Web-link analysis, Data-streams, Locality-sensitive hashing, Computational advertising, Clustering, Recommender systems, Analysis of large graphs, Decision trees, Dimensionality reduction, Support-vector machines, and Frequent-itemset analysis.

Jure Leskovec

PROFESSOR JURE LESKOVEC  
COMPUTER SCIENCE DEPARTMENT, STANFORD  
UNIVERSITY

A handwritten signature of Jure Leskovec.

JEFFREY ULLMAN  
PROFESSOR OF COMPUTER SCIENCE, STANFORD  
UNIVERSITY

Anand Rajaraman

ENTREPRENEUR, ACADEMIC, AND VC, MILLIWAYS  
VENTURES

A handwritten signature of Anand Rajaraman.

PLEASE NOTE: SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS PARTICIPANT WAS ENROLLED AS A STUDENT AT STANFORD UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A STANFORD UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE PARTICIPANT.



CERTIFICATE  
Issued Dec. 30th, 2012

This is to certify that

# Sandipan Dey

successfully completed

## *M101: MongoDB for Developers*

a course of study offered by 10gen, an online learning  
initiative of 10gen The MongoDB Company through edX.

Dwight Merriman  
Chief Executive Officer  
10gen, Inc.

Andrew J. Erlichson  
Vice President, Education  
10gen, Inc.

### HONOR CODE CERTIFICATE

\*Authenticity of this certificate can be verified at <https://s3.amazonaws.com/edu-cert.10gen.com/downloads/f0f055474b342f58ccfc5ba0d8a62c/Certificate.pdf>



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Music Theory for Songwriters: The Fundamentals

Course completed on Jun 6, 2020 • 2 hours 50 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AYbZROoCW8IRtwiZDF4Q2GW9UuyY

MAY 15, 2013

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY



### Natural Language Processing

This introductory graduate/advanced undergraduate course introduces mathematical and computational models of language, and the application of these models to key problems in natural language processing.

*M J Collins*

---

MICHAEL COLLINS  
VIKRAM S. PANDIT PROFESSOR OF COMPUTER SCIENCE  
COLUMBIA UNIVERSITY



HIGHER SCHOOL OF ECONOMICS  
NATIONAL RESEARCH UNIVERSITY

Sep 8, 2020

# Sandipan Dey

has successfully completed

## Natural Language Processing

an online non-credit course authorized by HSE University and offered through Coursera

*Anna Potapenko Alexey Zobnin Anna Kozlova Yudin Sergey Andrei Zimovnov*

Anna Potapenko, Alexey Zobnin, Anna Kozlova, Sergey Yudin, Andrei Zimovnov

## COURSE CERTIFICATE



Verify at [coursera.org/verify/5LL97FQEMPAS](https://coursera.org/verify/5LL97FQEMPAS)

Coursera has confirmed the identity of this individual and their participation in the course.

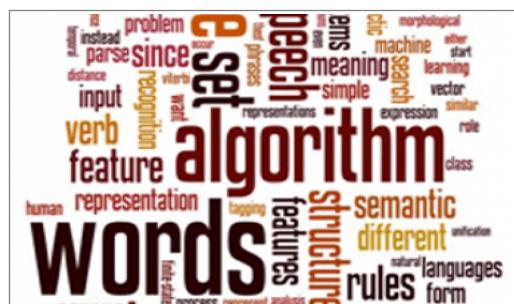
DECEMBER 06, 2012

# Online Course

# Statement of Accomplishment

# SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED A FREE ONLINE OFFERING OF THE FOLLOWING COURSE PROVIDED BY STANFORD UNIVERSITY THROUGH COURSERA INC.



# Natural Language Processing

Course content included the topics of spelling correction, sentiment analysis, information extraction, syntactic parsing, meaning extraction and question answering, based on underlying theory drawn from probability, statistics, linguistics, and algorithms.

2-14

DAN JURAFSKY  
PROFESSOR OF LINGUISTICS  
STANFORD UNIVERSITY

Christopher Manning

CHRISTOPHER MANNING  
PROFESSOR OF COMPUTER SCIENCE  
STANFORD UNIVERSITY

PLEASE NOTE: SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM COURSES TAUGHT ON CAMPUS BUT THEY ARE NOT EQUIVALENT TO ON-CAMPUS COURSES. THIS STATEMENT DOES NOT AFFIRM THAT THIS PARTICIPANT WAS ENROLLED AS A STUDENT AT STANFORD UNIVERSITY IN ANY WAY. IT DOES NOT CONFER A STANFORD UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DOES NOT VERIFY THE IDENTITY OF THE PARTICIPANT.

# Natural Language Processing

## Statement of Accomplishment

Name: Sandipan Dey

Email: sandipan.dey@gmail.com

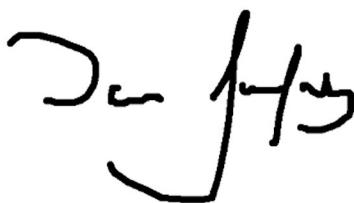
This statement of accomplishment records that Sandipan Dey successfully completed our March - May 2012 free online offering of Natural Language Processing with the following score according to our automated system:

Problem Sets: **27.1** out of a maximum of 28

Programming Assignments: **62.5** out of a maximum of 72

Scaled Total: **89.6** out of a maximum of 100

To successfully complete this challenging 8-week online class, all students were required to watch 16 hours of lecture, complete 8 problem sets, and code a series of 8 substantial programming assignments in Java or Python while scoring at least 70% of the maximum possible points.



Dan Jurafsky

Professor of Linguistics and  
Professor by Courtesy of Computer Science,  
Stanford University



Christopher Manning

Associate Professor of Computer Science  
and Linguistics,  
Stanford University

Please note: This online offering of Natural Language Processing draws on material from our classes at Stanford University but does not reflect the entire curriculum offered to students enrolled in our courses at Stanford. This statement does not confer Stanford credit, grades, a degree or a certification or affirm that you were enrolled as a Stanford student, nor does it verify the identity of the individual who took the course.



Sep 27, 2020

## Sandipan Dey

has successfully completed

### Natural Language Processing in TensorFlow

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

*Laurence Moroney*

Laurence Moroney  
Lead AI Advocate, Google

## COURSE CERTIFICATE



Verify at [coursera.org/verify/KA2WRMV5TQ6M](https://coursera.org/verify/KA2WRMV5TQ6M)

Coursera has confirmed the identity of this individual and their participation in the course.



4 Courses

Natural Language Processing with Classification and Vector Spaces

Natural Language Processing with Probabilistic Models

Natural Language Processing with Sequence Models

Natural Language Processing with Attention Models

Sep 25, 2020

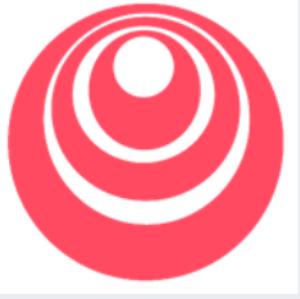
## Sandipan Dey

has successfully completed the online, non-credit Specialization

# Natural Language Processing

Congratulations! You have completed all four courses of Natural Language Processing - a deeplearning.ai Specialization. As part of this Specialization, you have learned the classical machine learning skills and the state-of-the-art deep learning techniques needed to build NLP systems. You are now equipped to design applications that perform question-answering and sentiment analysis, create tools to translate languages and summarize text, and build chatbots! These, and other NLP applications, are going to be at the forefront of the coming transformation to an AI-powered future.

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.



*Younes Bensouda Mourri Łukasz Kaiser*

Younes Bensouda  
Mourri  
Instructor of AI at  
Stanford University

Łukasz Kaiser  
Staff Research Scientist  
at Google and Chargé de Recherche at CNRS

Verify this certificate at:  
[coursera.org/verify/specialization/ZDNUP48EU24T](https://coursera.org/verify/specialization/ZDNUP48EU24T)



Sep 25, 2020

## Sandipan Dey

has successfully completed

### Natural Language Processing with Attention Models

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

*Younes Bensouda Mourri Lukasz Kaiser*

---

Younes Bensouda Mourri, Instructor of AI at Stanford University  
Lukasz Kaiser, Staff Research Scientist at Google Brain and Chargé de Recherche at CNRS

## COURSE CERTIFICATE



Verify at [coursera.org/verify/BVUJYRUNXTNU](https://coursera.org/verify/BVUJYRUNXTNU)

Coursera has confirmed the identity of this individual and their participation in the course.



Aug 15, 2020

## Sandipan Dey

has successfully completed

Natural Language Processing with Classification  
and Vector Spaces

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

*Younes Bensouda Mourri Lukasz Kaiser*

---

Younes Bensouda Mourri, Instructor of AI at Stanford University  
Lukasz Kaiser, Staff Research Scientist at Google Brain and Chargé de Recherche at CNRS

## COURSE CERTIFICATE



Verify at [coursera.org/verify/9GWVCG9L7E36](https://coursera.org/verify/9GWVCG9L7E36)

Coursera has confirmed the identity of this individual and their participation in the course.



Sep 20, 2020

## Sandipan Dey

has successfully completed

### Natural Language Processing with Probabilistic Models

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

*Younes Bensouda Mourri Lukasz Kaiser*

---

Younes Bensouda Mourri, Instructor of AI at Stanford University  
Lukasz Kaiser, Staff Research Scientist at Google Brain and Chargé de Recherche at CNRS

## COURSE CERTIFICATE



Verify at [coursera.org/verify/VE5MLW4HBXSU](https://coursera.org/verify/VE5MLW4HBXSU)

Coursera has confirmed the identity of this individual and their participation in the course.



Sep 22, 2020

## Sandipan Dey

has successfully completed

### Natural Language Processing with Sequence Models

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

*Younes Bensouda Mourri Lukasz Kaiser*

---

Younes Bensouda Mourri, Instructor of AI at Stanford University  
Lukasz Kaiser, Staff Research Scientist at Google Brain and Chargé de Recherche at CNRS

## COURSE CERTIFICATE



Verify at [coursera.org/verify/WB8KEN2MSYSR](https://coursera.org/verify/WB8KEN2MSYSR)

Coursera has confirmed the identity of this individual and their participation in the course.



09/15/2017

## Sandipan Dey

has successfully completed

### Neural Networks and Deep Learning

an online non-credit course authorized by deeplearning.ai and offered through  
Coursera

A handwritten signature in blue ink that appears to read "Andrew Ng".

Adjunct Professor Andrew Ng  
Computer Science

## COURSE CERTIFICATE



Verify at [coursera.org/verify/XT4YUS8QGYYT](https://coursera.org/verify/XT4YUS8QGYYT)

Coursera has confirmed the identity of this individual and  
their participation in the course.

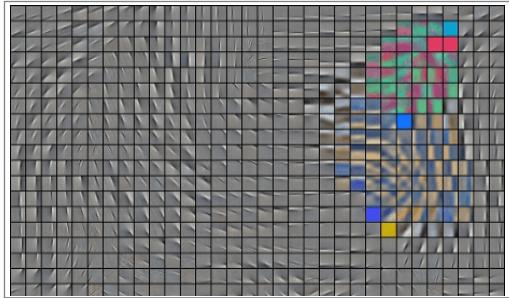
DECEMBER 19, 2012

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED UNIVERSITY OF TORONTO'S NON-CREDIT ONLINE OFFERING OF



### Neural Networks for Machine Learning

The course covered learning techniques for many different types of neural network including deep feed-forward networks, recurrent networks and Boltzmann Machines. It covered recent applications to speech, vision, and language, and used hands-on programming assignments.

*Geoffrey Hinton*

---

GEOFFREY E. HINTON  
DEPARTMENT OF COMPUTER SCIENCE  
UNIVERSITY OF TORONTO

PLEASE NOTE: THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT THE UNIVERSITY OF TORONTO. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT THE UNIVERSITY OF TORONTO IN ANY WAY. IT DOES NOT CONFER A UNIVERSITY OF TORONTO GRADE; IT DOES NOT CONFER UNIVERSITY OF TORONTO CREDIT; IT DOES NOT CONFER A UNIVERSITY OF TORONTO DEGREE; AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

# NLP with Python for Machine Learning Essential Training

Course completed on May 14, 2020 • 4 hours 14 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Stanley".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AWhrQwqzhes4iqrIDIUruAmLLkbx



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Node.js Essential Training

Course completed on Jun 8, 2020 • 1 hour 53 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AWLWKsfyavlA92vyrdkWR\_R0GIGE



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### OpenCV for Python Developers

Course completed on May 21, 2020 • 2 hours 35 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AV6bpRPqD5KKG40l6jS\_xyP2MGRX



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

# Parallel and Concurrent Programming with Python 2

Course completed on May 12, 2020 • 2 hours 19 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Stanley".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: Ad6tzxM4VHbu6C6HQiDGsVtp03r7



## February 2015 Inductees

|                   |                  |
|-------------------|------------------|
| Łukasz Grzybowski | Leonid Gorelik   |
| Aaron Pigeon      | Leoni Trusov     |
| Achim Brellé      | Leos Zavrel      |
| Ada Lee           | LEUNG YEE        |
| Adam Dohnal       | HIN              |
| Adekoja           | Li Sixiang       |
| Adekunle Rotimi   | Li Yutze         |
| Adolfo Zarrias    | Lin Wang         |
| Torrico           | Linda            |
| Adrián Álvarez    | Steenhuizen      |
| del Castillo      | Ling Luo         |
| Adrien            | Lingyue Pan      |
| Papaoianou        | Liu Li           |
| Adugna K.         | Luan felipe      |
| Wondimu           | Alves Da Silva   |
| Ahmed             | Luca Piovano     |
| Mohamed           | Luca Poretti     |
| Elsallamy         | Lucas Marin      |
| Ainun Najib,      | Isern            |
| B.Eng             | Luigi Canali     |
| Alberto Cano      | Luigi Pratiano   |
| Rojas             | Luis A. Perez    |
| Alberto           | Luis Feliz       |
| Pelliccione       | Manteón          |
| Aleksandra        | Luis R. Villalta |
| Joanna            | Evgeny Nekrasov  |
| Żarnowska         | IzI1024          |
| Alex Laputski     | Ewa              |
| Alex Marandon     | Dwornikowska     |
|                   | Fabio Buccarelli |
|                   | Fábio Rodrigues  |
|                   | Fabrizio Zanette |

|                  |                    |                  |                  |
|------------------|--------------------|------------------|------------------|
| Alex Reinstein   | Facundo Mariano    | Maksym           | Rudolfs Dambis   |
| Alexander B.     | Ciancio            | Osmanno          | Ruohan Gao       |
| Cosico           | Fanghong Jian 简    | Malika Hadjat-   | Rupa Bisaria     |
| Alexander        | 芳洪                 | Guerinik         | Ryan Roethle     |
| Hendorf          | Federico Vegetti   | Mamello          | Ryan Smith-      |
| Alexander        | Fei Xia            | Thinyane         | Roberts          |
| Rhatushnyak      | Felipe Ismael      | Manhua Jiang     | Saeed Majidi     |
| Alexander        | Saldau García      | Mantrydas        | Sam Somuah       |
| Svyazin          | Fernando Rivera-   | Juozapavicius    | Samuel Peeters   |
| Alexandr         | Illingworth        | Manuel Bordis    | Sandipan Dey     |
| Polyakov         | Fidel Rebón Ortiz  | Rodriguez        | Sandra Mitrovic  |
| Alexandre        | Filip Deryckere    | Manuel           | Sandra Yojana    |
| Gadebski         | Florian Engelke    | Gandarela        | Meneses Barroso  |
| Alexandre Mah    | Franco Cano        | Marc Moualem     | Sandro           |
| Alexandru Busila | Erazo              | Marcello La      | Radovanović      |
| Alexey Laptev    | François Pelletier | Rocca            | SANEM SEREN      |
| Alexey Shpaner   | Frank Kowalewski   | Marcelo Ladeira  | SEVER            |
| Alexey Zhilenko  | Frank Rehrmann     | Reis             | Santos Herranz   |
| Alfonso de la    | Gabe Fernando      | Marcin Kaminski  | Saqib Koithawala |
| Vega Ruiz        | Gabriel Jara       | Marco Antônio    | Saud Alshoud     |
| Alfonso Hiram    | Bulnes             | Boaiavo Gomes    | Saurabh Jirawala |
| Ginori-Gonzalez  | Gabriel Trautmann  | Marco Ceruso     | Savio Sebastian  |
| Ali Tarig Bhatti | Gabriel Z M        | Marco Raul       | Sayantan Sarkar  |
| Alwin Hilberink  | Ramos              | Soares Amorim    | Sayma Akther     |
| Amin Jalali      | Gary Rozal         | Marco            | Scot Waye        |
| Amit Khanna      | Gary Wayne         | Salvaggiao       | Sebastien        |
| Ananya Harsh     | Burrows            | Marcus Wilson    | D'ARCO           |
| Jha              | Ge Yao             | Marek Sušlický   | Serge Pons       |
| Anastasia        | Gedi Zheng         | Maria Meier      | Sergey M.        |
| Goryacheva       | Geert Ceuppens     | Maria Orr        | Vedernikov       |
| Anastasiya       | Gene Osgood        | Marina           | Sergey Malov     |
| Pimenova         | George Cozma       | Bekkerman        | Sergey           |
| Andre Luis       | Gerard Pieris      | Mário Luis Pinto | Trofimovsky      |
| Rolim Cagnacci   | Gianni Veloci      | Antunes          | Sergio Guerrero  |
| Andrej           | Giovanni Yoko      | Mario Navas      | Montaüis         |
| Dobrkovic        | Guillaume Dreyer   | Mariusz Gil      | Shakir Riyaz     |
| Andrew M.        | Gustavo Jerónimo   | Marta Kowalska   | Shihdaopeng      |
| Clinnin          | Gregorio Jiménez   | Mark E. Nichols  | Shisi Wang       |
| Andrey Bat       | Mesa               | Mark Rockwell    | Sheng Cai        |
| Andrey Pronin    | Burr               | Marta Kowalska   | Shengda Ding     |
| Andri V.         | Guillaume Dreyer   | Marta Samól      | Shihua Wang      |
| Carreiro         | Gustavo Jerónimo   | Martin Svatós    | Shiun-Zu Kuo     |
| Andrii Daniliuk  | Ochovo             | Mateja           | Show-Jye Cheng   |
| Andris Åseda     | H. Burak           | Grobelyn         | Shuai Wang       |
| Andrzej          | Sendogdu           | Mark Rockwell    | Shujie Zhang     |
| Giniewicz        | Hai T. Pham        | Máti Bartalos    | Silvia Dassie    |
| Ang Li           | Hamid Ouni         | Máti Rózsai      | Simon South      |
|                  | Han Li             | Matias Dahl      |                  |

# Pattern Discovery Hall of Fame

[Help Center](#)

## February 2015 Inductees

|                   |              |              |         |             |         |                 |                |         |                |              |        |             |           |         |       |         |           |                       |              |       |         |             |            |        |           |               |               |               |                 |     |              |                   |                 |                  |          |                  |         |             |          |             |                 |        |             |       |           |       |             |              |           |                  |
|-------------------|--------------|--------------|---------|-------------|---------|-----------------|----------------|---------|----------------|--------------|--------|-------------|-----------|---------|-------|---------|-----------|-----------------------|--------------|-------|---------|-------------|------------|--------|-----------|---------------|---------------|---------------|-----------------|-----|--------------|-------------------|-----------------|------------------|----------|------------------|---------|-------------|----------|-------------|-----------------|--------|-------------|-------|-----------|-------|-------------|--------------|-----------|------------------|
| Łukasz Grzybowski | Aaron Pigeon | Achim Brelle | Ada Lee | Adam Dohnal | Adekoya | Adekunle Rotimi | Adolfo Zarrias | Torrico | Adrián Álvarez | del Castillo | Adrien | Papaioannou | Adugna K. | Wondimu | Ahmed | Mohamed | EISallamy | Ainun Najib,<br>B.Eng | Alberto Cano | Rojas | Alberto | Pelliccione | Aleksandra | Joanna | Żarnowska | Alex Laputski | Alex Marandon | Evan Grundman | Evgeny Nekrasov | Ewa | Dwornikowska | Fabio Bucciarelli | Fábio Rodrigues | Fabrizio Zanette | Mantecón | Luis R. Villalta | IzI1024 | Mag. Hannes | Windisch | Maja Fahlřn | Maja Siljanoska | Simons | Roman Mozil | Roman | Romanenko | Roman | Shcherbakov | Roman Slivin | Ron Starr | Rosolino Finazzo |
|-------------------|--------------|--------------|---------|-------------|---------|-----------------|----------------|---------|----------------|--------------|--------|-------------|-----------|---------|-------|---------|-----------|-----------------------|--------------|-------|---------|-------------|------------|--------|-----------|---------------|---------------|---------------|-----------------|-----|--------------|-------------------|-----------------|------------------|----------|------------------|---------|-------------|----------|-------------|-----------------|--------|-------------|-------|-----------|-------|-------------|--------------|-----------|------------------|

|                  |                    |                  |                  |
|------------------|--------------------|------------------|------------------|
| Alex Reinstein   | Facundo Mariano    | Maksym           | Rudolfs Dambis   |
| Alexander B.     | Ciancio            | Osmanov          | Ruohan Gao       |
| Cosico           | Fanghong Jian 简    | Malika Hadjat-   | Rupa Bisaria     |
| Alexander        | 芳洪                 | Guerinik         | Ryan Roethle     |
| Hendorf          | Federico Vegetti   | Mamello          | Ryan Smith-      |
| Alexander        | Fei Xia            | Thinyane         | Roberts          |
| Rhatushnyak      | Felipe Ismael      | Manhua Jiang     | Saeed Majidi     |
| Alexander        | Saldaúa Garcia     | Mantvydas        | Sam Somuah       |
| Svyazin          | Fernando Rivera-   | Juozapavicius    | Samuel Peeters   |
| Alexandr         | Illingworth        | Manuel Bordīs    | Sandipan Dey     |
| Polyakov         | Fidel Rebón Ortiz  | Rodriguez        | Sandra Mitrovic  |
| Alexandre        | Filip Deryckere    | Manuel           | Sandra Yojana    |
| Gadebski         | Florian Engelke    | Gandarela        | Meneses Barroso  |
| Alexandre Mah    | Franco Cano        | Marc Moualem     | Sandro           |
| Alexandru Busila | Erazo              | Marcello La      | Radovanović      |
| Alexey Laptiev   | François Pelletier | Rocca            | SANEM SEREN      |
| Alexey Shpaner   | Frank Kowalewski   | Marcelo Ladeira  | SEVER            |
| Alexey Zhilenko  | Frank Rehrmann     | Reis             | Santos Herranz   |
| Alfonso de la    | Gabe Fernando      | Marcin Kaminski  | Saqib Kothawala  |
| Vega Ruiz        | Gabriel Jara       | Marco António    | Saud Alrshoud    |
| Alfonso Hiram    | Bulnes             | Boialvo Gomes    | Saurabh Jirawala |
| Ginori-Gonzalez  | Gabriel Trautmann  | Marco Ceruso     | Savio Sebastian  |
| Ali Tariq Bhatti | Gabriel Z M        | Marco Raul       | Sayantan Sarkar  |
| Alwin Hilberink  | Ramos              | Soares Amorim    | Sayma Akther     |
| Amin Jalali      | Gary Rozal         | Marco            | Scot Waye        |
| Amit Khanna      | Gary Wayne         | Salvalaggio      | Sebastien        |
| Ananya Harsh     | Burrows            | Marcus Wilson    | D'ARCO           |
| Jha              | Ge Yao             | Marek Sušický    | Serge Pons       |
| Anastasia        | Gedi Zheng         | Maria Meier      | Sergey M.        |
| Goryacheva       | Geert Ceuppens     | Maria Orr        | Vedernikov       |
| Anastasiya       | Gene Osgood        | Marina           | Sergey Malov     |
| Pimenova         | George Cozma       | Bekkerman        | Sergey           |
| Andre Luis       | Gerard Pieris      | Mário Luis Pinto | Trofimovsky      |
| Rolim Cagnacci   | Gianni Velocci     | Antunes          | Sergio Guerrero  |
| Andrej           | Giovanni Yoko      | Mario Navas      | Montaúis         |
| Dobrkovic        | Giuseppe Sinicropi | Mariusz Gil      | Shakir Riyaz     |
| Andrew M.        | Gregor Gütschow    | Mark E. Nichols  | Ahmed Juolay     |
| Clinnin          | Gregorio Jimínez   | Mark Rockwell    | Sheng Cai        |
| Andrey Bat       | Mesa               | Burr             | Shengda Ding     |
| Andrey Pronin    | Guillaume Dreyer   | Marta Kowalska   | shidaopeng       |
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| Giniewicz        | Hamid Ouni         | Mátí Rózsai      | Silvia Dassière  |
| Ang Li           | Han Li             | Matias Dahl      | Simon South      |
| Angell Wang      | Hannes Muurinen    | Matthew          | Simone Spedo     |
| Angie Catalina   | Hans-Peter         | Honaker          | Siri             |
| Carrillo         | Oskamp             | Matthew Pardini  | Prasansantikul   |

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| Anton Ornatskyi | Heeren Sharma      | Maximiliano     | Suad Al Darra     |
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| Randazzo        | Heonkyu Jin        | Mayank Dang     | Powar             |
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| Widodo          | Castaneda          | Mohamud         | Timothy David     |
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| Bologne         | Barradas           | Kavipurapu      | Timothy M.        |
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| Cross           | Ivan Cornellet     | Muhammad        | Timothy           |
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| Hoschke         | Jan Kučera         | Nabeel Mukhtar  | uddipan           |

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| Cameron Brown       | Jean R. Rodrigues     | Nazzareno        | Valeria            |
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| Carl Soane          | Meriaux               | NGUYEN Anh       | Vanessa            |
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| Christophe Kumsta   | Jin-Hee Cho           | Razgulyaev       | Viktorija          |
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| Cody R. Henderson   | Joris Keizers         | Hussain          | Vladimir           |
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| Corey Auger         | Amaya                 | Oyedele Joseph   | Vladimir Tomecek   |
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|                     | Juan Carlos           | Neelamraju       | WangZhen           |
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|                     | Juan Francisco        | Donnchadhha      | Weber Shao         |
|                     | Ottonello             | Palmira          | Wei Chen           |
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| Mastrofrancesco       | Jaramillo          | Paul Hellwig   | William Santo    |
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| Dan Vogel             | Juney Dijkstra     | Pedro Henrique | Xiaocheng Hou    |
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| Debpriya Seal         | Katerina           | Piyush Routray | Yi Zhao          |
| Denis                 | Atanasova Baneva   | Plamen Nedev   | Yi Zhu           |
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| Devin Michael         | Kenneth G.         | Prankit Jain   | Yingchen He      |
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| Tkaczyk               | Komivi Edem        | Baboelal       | Yufei Wang       |
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Sandipan Dey &lt;sandipan.dey@gmail.com&gt;

## Pattern Discovery in Data Mining Mastery Badge

1 message

Jiawei Han &lt;no-reply@illinois.edu&gt;

Reply-To: Replies will not be read &lt;no-reply-webservices@illinois.edu&gt;

To: sandipan.dey@gmail.com

Wed, Apr 1, 2015 at 7:00 PM

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Hello Sandipan Dey,

Congratulations on earning the **Mastery Badge** for your efforts in the *Pattern Discovery in Data Mining* course offered by the [University of Illinois at Urbana-Champaign](#)! Your average total score of 95% or higher on the quizzes in this course qualified you for this badge.

As a special reward, we would like to include your name in the [Hall of Fame](#) page to be posted within the course and future offerings of the course. To do so, please [fill out this form](#) by **April 12, 2015** and we will add your name to the Hall of Fame. Your email address will NOT be shared on the Hall of Fame page.

Thank you for your active participation in this course. I wish you the best!

Jiawei Han  
Abel Bliss Professor  
Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



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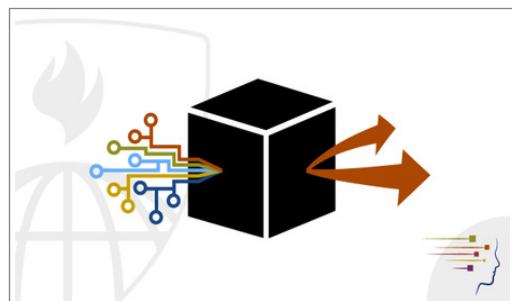
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### Practical Machine Learning

Upon completion of this course students understand the components of a machine learning algorithm and how to apply multiple basic machine learning tools. Students also learn to apply these tools to build and evaluate predictors on real data.



JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH


BRIAN CAFFO, PHD, MS  
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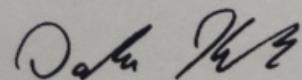
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### Probabilistic Graphical Models

Congratulations! You have successfully completed the free online offering of Probabilistic Graphical Models. To successfully complete the this free online class, students were required to watch lectures, complete problem sets, and take a final exam.



DAPHNE KOLLER  
PROFESSOR OF COMPUTER SCIENCE  
STANFORD UNIVERSITY

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MAY 01, 2015

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### Probability

This course provides a self-contained introduction to mathematical probability, from historical foundations to modern applications, culminating with the major distributions, the remarkable limit laws, and the fabulous bell curve.

*Santosh S. Venkatesh*

---

PROFESSOR SANTOSH S. VENKATESH  
SCHOOL OF ENGINEERING AND APPLIED SCIENCE  
UNIVERSITY OF PENNSYLVANIA



# Probability and Statistics: To p or not to p?

by University of London

## Overview

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

## Grades

Notes

Discussion Forums

Messages

Course Info



## Congratulations!

You've successfully completed Probability and Statistics: To p or not to p?!

[Rate Course](#)

## Instructor's Note



Dr James Abdey

Welcome to Probability and Statistics: To p or not to p?! You're joining thousands of learners currently enrolled in the course. I'm excited to have you in the class and look forward to your contributions to the learning community.

[More](#)

-  Week 1
-  Week 2
-  Week 3
-  Week 4
-  Week 5
-  Week 6



## Grades



You passed this course! Your grade is 98%.

Overview

Grades

Notes

Discussion Forums

Messages 1

Course Info

| Item   | Status       | Due                    | Weight | Grade |
|--|--------------|------------------------|--------|-------|
| Week One Quiz<br>Quiz  | Passed       | Apr 26<br>12:29 PM IST | 10%    | 100%  |
| Week Two Quiz<br>Quiz  | Passed       | May 3<br>12:29 PM IST  | 10%    | 100%  |
| Week Three Quiz<br>Quiz  | Passed       | May 10<br>12:29 PM IST | 10%    | 100%  |
| Assignment One: Descriptive Statistics<br><small>Submit your assignment and review 3 peers' assignments to get your grade.</small> |              |                        | 20%    | 90%   |
| Submit your assignment   | Passed       | May 10<br>12:29 PM IST |        |       |
| Review 3 peers' assignments.   | 6/3 reviewed | May 13<br>12:29 PM IST |        |       |
| Week Four Quiz<br>Quiz   | Passed       | May 17<br>12:29 PM IST | 10%    | 100%  |
| Week Five Quiz<br>Quiz   | Passed       | May 24<br>12:29 PM IST | 10%    | 100%  |
| Assignment Two: Hypothesis Testing<br><small>Submit your assignment and review 3 peers' assignments to get your grade.</small>     |              |                        | 20%    | 100%  |
| Submit your assignment   | Passed       | May 24<br>12:29 PM IST |        |       |
| Review 3 peers' assignments.   | 8/3 reviewed | May 27<br>12:29 PM IST |        |       |
| Week Six Quiz<br>Quiz  | Passed       | May 31<br>12:29 PM IST | 10%    | 100%  |



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## Certificate of Completion

Congratulations, Sandipan Dey

### Programming Foundations: Fuzzy Logic

Course completed on Jun 8, 2020 • 41 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

*Tanya Stanley*  
VP, Learning Content at LinkedIn

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1000 W Maude Ave  
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5 Courses



Nov 13, 2020

## Sandipan Dey

has successfully completed the online, non-credit Specialization

# Python 3 Programming

This specialization teaches the fundamentals of programming in Python 3. We will begin at the beginning, with variables, conditionals, and loops, and get to some intermediate material like keyword parameters, list comprehensions, lambda expressions, and class inheritance. You will have lots of opportunities to practice. You will also learn ways to reason about program execution, so that it is no longer mysterious and you are able to debug programs when they don't work. By the end of the specialization, you'll be writing programs that query Internet APIs for data and extract useful information from them. And you'll be able to learn to use new modules and APIs on your own by reading the documentation. That will give you a great launch toward being an independent Python programmer.

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

*Stephen Oney Paul Resnick*

Steve Oney  
Assistant Professor  
School of Information  
Paul Resnick  
Michael D. Cohen  
Collegiate Professor  
School of Information

A handwritten signature of Stephen Oney.

Jaclyn Cohen  
Lecturer  
School of Information

A handwritten signature of Christopher Brooks.

Christopher Brooks  
Research Assistant  
Professor  
School of Information

Verify this certificate at:  
[coursera.org/verify/specialization/SRXKT55SXWBH](https://coursera.org/verify/specialization/SRXKT55SXWBH)



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Python: Advanced Design Patterns

Course completed on May 12, 2020 • 1 hour 24 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AUPQF4wyZ9RAIW8V7bVjA0THmkW2



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Python Statistics Essential Training

Course completed on Jun 5, 2020 • 2 hours 58 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AYgj4j4HK-ygPAXYcpbEeyBC14DB

DECEMBER 06, 2012

# Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE ONLINE OFFERING OF



### Quantum Mechanics and Quantum Computation

This advanced undergraduate course provides an introduction to the basic principles of quantum mechanics and to quantum computation, including qubits and quantum gates, entanglement, quantum fourier transform, and quantum algorithms for factoring and unstructured search.

A handwritten signature in black ink, appearing to read "Umesh Vazirani".

---

UMESH V. VAZIRANI  
ROGER A. STRAUCH PROFESSOR OF EECS

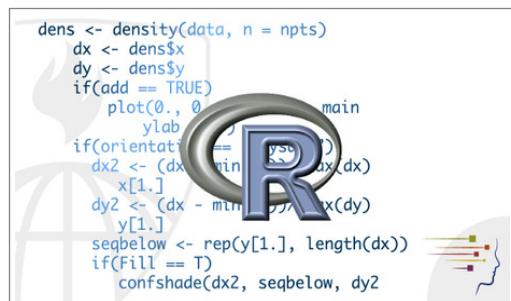
MAY 09, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### R Programming

This course covers how to use & program in R for effective data analysis. It covers practical issues in statistical computing: programming in R, reading data into R, accessing R packages, writing R functions, debugging, profiling R code, & organizing and commenting R code.



ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

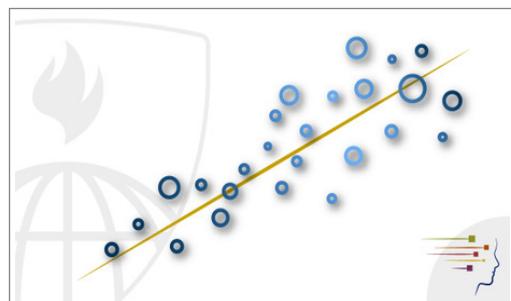
JULY 08, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

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### Regression Models

Students learn how to fit regression models, interpret coefficients, and investigate residuals and variability. Students also learn to use dummy variables, multivariable adjustment, and extensions to generalized linear models, especially Poisson and logistic regression.

*Brian Caaffo*

BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

AUGUST 11, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### Reproducible Research

This course covers how to write a document using R markdown, integrate live R code into a literate statistical program, compile R markdown documents using knitr and related tools, and organize a data analysis so that it is reproducible and accessible to others.

---



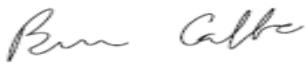
ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

---



JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

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BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



Like this course? Become an expert by joining the [Robotics Specialization](#) ([/specializations/robotics](#)).

[Upgrade](#)

([https://accounts.coursera.org/i/zendesk/courserahelp?  
return\\_to=https://learner.coursera.help/hc](https://accounts.coursera.org/i/zendesk/courserahelp?return_to=https://learner.coursera.help/hc))

# 8/8

Assignments Passed

## Introduction and Graph-based Plan Methods

**Quiz:** Graph-based Planning Methods 4 questions

Due Feb 22

Passed ✓

Grade 100%

(</learn/robotics-motion-planning/exam/zZvks/graph-based-planning-methods>)

**Assignment:** Graph-based Planning 3h 00m

Due Feb 22

Passed ✓

Grade 100%

(</learn/robotics-motion-planning/programming/UNHm0/graph-based-planning>)

## Configuration Space

**Quiz:** Configuration Space 4 questions

Due Feb 29

Passed ✓

Grade 100%

(</learn/robotics-motion-planning/exam/dYQsq/configuration-space>)

**Assignment:** Configuration Space 3h 00m

Due Feb 29

Passed ✓

Grade 100%

(</learn/robotics-motion-planning/programming/BBYLi/configuration-space>)

## Sampling-based Planning Methods

**Quiz:** Sampling-based Methods 3 questions

Due Mar 7

Passed ✓

Grade 100%

(</learn/robotics-motion-planning/exam/rKY0n/sampling-based-methods>)

**Assignment:** Random Sampling-based Approaches 3h 00m

Due Mar 7

Passed ✓

Grade 100%

(</learn/robotics-motion-planning/programming/aytRO/random-sampling-based-approaches>)

## Artificial Potential Field Methods

 **Quiz:** Artificial Potential Fields 3 questions

|            |          |            |
|------------|----------|------------|
| Due Mar 14 | Passed ✓ | Grade 100% |
|------------|----------|------------|

(/learn/robotics-motion-planning/exam/ezgcL/artificial-potential-fields)

**Assignment:**  
✓ Gradient-based Planner 3h 00m

|            |          |            |
|------------|----------|------------|
| Due Mar 14 | Passed ✓ | Grade 100% |
|------------|----------|------------|

(/learn/robotics-motion-planning/programming/A9uVI/gradient-based-planner)

**How to Pass the Course**

Pass all graded assignments to complete the course.



Like this course? Become an expert by joining  
the [Robotics Specialization \(/specializations/robotics\)](#).

[Upgrade](#)

([https://accounts.coursera.org/i/zendesk/courserahelp?  
return\\_to=https://learner.coursera.help/hc](https://accounts.coursera.org/i/zendesk/courserahelp?return_to=https://learner.coursera.help/hc))

# Congratulations!

You have successfully completed **Robotics: Computational Motion Planning**, 1 of 6 courses in **Robotics** from **University of Pennsylvania**.

Final Grade

100.0 %

Unlock a certificate to share your achievement with the world!



CJ Taylor

## Keep Learning

Course 3 of 6

### Robotics: Mobility

How can robots use their motors and sensors to move around in an...

[View Course](#)

Starts March 14, 2016  
(/learn/robotics-mobility)

[Help Center](#)

## Course

**WEEK 1**

Introduction and Graph-based Plan Methods

(/learn/robotics-motion-planning/home/week/1)

**WEEK 2**

Configuration Space

(/learn/robotics-motion-planning/home/week/2)

**WEEK 3**

Sampling-based Planning  
Methods

[Continue](#)

(/learn/robotics-motion-planning/home/week/3)

**WEEK 4**

Artificial Potential Field Methods

(/learn/robotics-motion-planning/home/week/4)

## Course Settings

---

**Verification Settings**

Verification Settings 

# Robotics: Estimation and Learning

by University of Pennsylvania



Daniel Lee



We are excited to work with you through topics in robotics related to Bayesian methods. In this course, we explore projects with legged and wheeled robots. We look forward to getting to know you!

Estimation and Learning Course Team

## Congratulations!

You've successfully completed Course 5 of 6: **Robotics: Estimation and Learning**

Keep going!



✓ WEEK 1



✓ WEEK 2



✓ WEEK 3



✓ WEEK 4



Like this course? Become an expert by joining the [Robotics Specialization](#).

[Upgrade](#)

4/4

Assignments Passed

100.0%

Final Grade

|  | Due | Weight | Passed | Grade |
|--|-----|--------|--------|-------|
|--|-----|--------|--------|-------|

Gaussian Model Learning

✓ **Assignment:** Color Learning  
and Target Detection 3h 00m

May 23

25%



100%

Bayesian Estimation - Target Tracking

✓ **Assignment:** Kalman Filter  
Tracking 3h 00m

May 30

25%



100%

[Help Center](#)

## Mapping

|                                     |  |        |       |     |                                     |      |
|-------------------------------------|--|--------|-------|-----|-------------------------------------|------|
| <input checked="" type="checkbox"/> | <b>Assignment:</b> 2D Occupancy Grid Mapping | 3h 00m | Jun 6 | 25% | <input checked="" type="checkbox"/> | 100% |
|-------------------------------------|--|--------|-------|-----|-------------------------------------|------|

## Bayesian Estimation - Localization

|                                     |   |        |        |     |                                     |      |
|-------------------------------------|---|--------|--------|-----|-------------------------------------|------|
| <input checked="" type="checkbox"/> | <b>Assignment:</b> Particle Filter Based Localization | 3h 00m | Jun 13 | 25% | <input checked="" type="checkbox"/> | 100% |
|-------------------------------------|---|--------|--------|-----|-------------------------------------|------|

## Course Policies

### How to pass this course

Pass all graded assignments (listed above) to pass this course.

### Due dates

- Due dates for each assignment are listed above.
- There is no late penalty for submitting after an assignment's due date - you just need to pass before the session ends.
- Note: Some Peer Review assignments may have a deadline restricting submission after 7 days past the due date.

### If you are not able to complete the course in this session

- Most courses have a new session starting every few weeks.
- Your progress from this session will carry over to any future sessions.
- Learn more about switching sessions.





Like this course? Become an expert by joining the [Robotics Specialization](#).

Course Home

Grades

Discussion Forums

Resources

Course Info

4/4

Assignments Passed

100%

Final Course Grade

### Gaussian Model Learning

|   |  | Due    | Weight | Passed  | Grade |
|---|--|--------|--------|---|-------|
|  <b>Programming Assignment:</b> Color Learning and Target Detection 3h |  | May 22 | 25%    |  | 100%  |

### Bayesian Estimation - Target Tracking

|  |  |        |     |   |      |
|--|--|--------|-----|---|------|
|  <b>Programming Assignment:</b> Kalman Filter Tracking 3h |  | May 29 | 25% |  | 100% |
|--|--|--------|-----|---|------|

### Mapping

|   |  |       |     |   |      |
|---|--|-------|-----|---|------|
|  <b>Programming Assignment:</b> 2D Occupancy Grid Mapping 3h |  | Jun 5 | 25% |  | 100% |
|---|--|-------|-----|---|------|

### Bayesian Estimation - Localization

|  |  |        |     |   |      |
|--|--|--------|-----|---|------|
|  <b>Programming Assignment:</b> Particle Filter Based Localization 3h |  | Jun 12 | 25% |  | 100% |
|--|--|--------|-----|---|------|

Like this course? Become an expert by joining the [Robotics Specialization](#).

[Upgrade](#)

# Congratulations!

You have successfully completed **Robotics: Estimation and Learning**, 1 of 6 courses in  
**Robotics** from **University of Pennsylvania**.

Final Grade

100.0 %

Unlock a certificate to share your achievement with the world!



Daniel Lee

[Help Center](#)

[Keep Learning](#)

Course 1 of 6  
Robotics: Aerial Robotics

How can we create agile micro aerial vehicles that are able to operate autonomously in cluttered indoor and outdoor environments? You will gain an introduction to the mechanics of flight and the design of quadrotor flying robots and will be able to develop dynamic models, derive controllers, and synthesize planners for operating in three dimensional environments. You will be exposed to the challenges of... using noisy sensors for localization and maneuvering in complex, three-dimensional environments. Finally, you will gain insights through seeing real world examples of the possible applications and challenges for the rapidly-growing drone industry.

## Course

### WEEK 1

Gaussian Model Learning

### WEEK 2

Bayesian Estimation - Target Tracking

### WEEK 3

Mapping

**View Course**

Starts June 6

**WEEK 4****Bayesian Estimation - Localization****Continue****Course Settings****Verification Settings**Verification Settings 

# Robotics: Perception

by University of Pennsylvania



Welcome to Robotics: Perception! You're joining thousands of learners currently enrolled in the course. We're excited to have you in the class.

▼ More

## Congratulations!

You've successfully completed Course 4 of 6: Robotics: Perception

Keep going!



✓ WEEK 1



✓ WEEK 2



✓ WEEK 3



✓ WEEK 4



(<https://accounts.coursera.org/i/zendesk>)



Home

(</learn/robotics-perception/home/welcome>)

Course Content

(</learn/robotics-perception/home/week/>)

Assignments

(</learn/robotics-perception/home/assignments>)

Discussions

(</learn/robotics-perception/discussions>)

Resources

(</learn/robotics-perception/resources/Wpo75>)

Course Info

Like this course? Become an expert by joining the [Robotics Specialization \(/specializations/robotics\)](#).

[Upgrade](#)

# Congratulations!

You have successfully completed **Robotics: Perception**, 1 of 6 courses in **Robotics** from **University of Pennsylvania**.

Final Grade **99.7 %**

[Unlock a certificate \(/certificate/robotics-perception\)](#) to share your achievement with the world!

(?)

How likely are you to recommend this course to a friend or colleague?



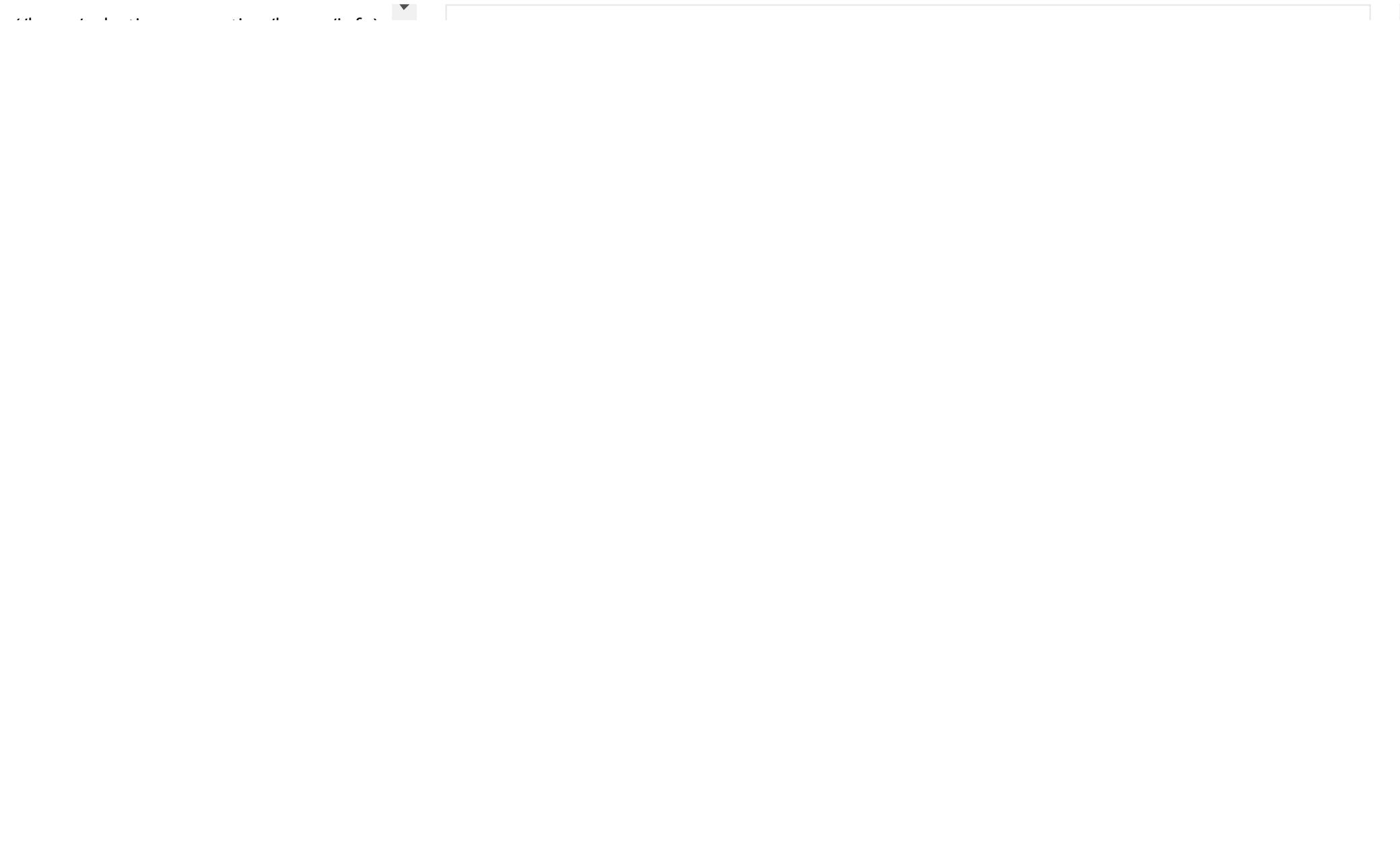
0 1 2 3 4 5 6 7 8 9 10

Not likely

Very likely

[Help Center](#)

Keep Learning



Like this course? Become an expert by joining the [Robotics Specialization](#).[Upgrade](#)

Course Home

25/25

99.7%

Assignments Passed

Final Course Grade

## Grades

Discussion Forums

Resources

Course Info

Due Weight Passed Grade

## Geometry of Image Formation

|  |  | Due    | Weight | Passed | Grade |
|--|--|--------|--------|--------|-------|
|  | <a href="#">Quiz: Introduction</a> 7 questions                                   | Apr 24 | 2%     | ✓      | 96%   |
|  | <a href="#">Quiz: Vanishing Points</a> 5 questions                               | Apr 24 | 2%     | ✓      | 100%  |
|  | <a href="#">Quiz: Perspective Projection</a> 5 questions                         | Apr 24 | 2%     | ✓      | 100%  |
|  | <a href="#">Quiz: Rotations and Translations</a> 7 questions                     | Apr 24 | 2%     | ✓      | 100%  |
|  | <a href="#">Quiz: Dolly Zoom</a> 2 questions                                     | Apr 24 | 2%     | ✓      | 100%  |
|  | <a href="#">Quiz: Feeling of Camera Motion</a> 3 questions                       | Apr 24 | 2%     | ✓      | 100%  |
|  | <a href="#">Quiz: How to Compute Intrinsic from Vanishing Points</a> 2 questions | Apr 24 | 2%     | ✓      | 100%  |
|  | <a href="#">Quiz: Camera Calibration</a> 3 questions                             | Apr 24 | 2%     | ✓      | 100%  |
|  | <a href="#">Programming Assignment: Dolly Zoom</a> 3h                            | Apr 24 | 9%     | ✓      | 100%  |

## Projective Transformations

|  |  |       |     |   |      |
|--|--|-------|-----|---|------|
|  | <a href="#">Quiz: Homogeneous Coordinates</a> 5 questions                      | May 1 | 4%  | ✓ | 100% |
|  | <a href="#">Quiz: Projective Transformations</a> 4 questions                   | May 1 | 3%  | ✓ | 100% |
|  | <a href="#">Quiz: Vanishing Points</a> 4 questions                             | May 1 | 3%  | ✓ | 100% |
|  | <a href="#">Quiz: Cross Ratios and Single View Metrology</a> 4 questions       | May 1 | 4%  | ✓ | 100% |
|  | <a href="#">Programming Assignment: Image Projection using Homographies</a> 3h | May 1 | 11% | ✓ | 100% |

## Pose Estimation

|  |  |       |     |   |      |
|--|--|-------|-----|---|------|
|  | <a href="#">Quiz: Visual Features</a> 6 questions              | May 8 | 3%  | ✓ | 100% |
|  | <a href="#">Quiz: Singular Value Decomposition</a> 8 questions | May 8 | 3%  | ✓ | 100% |
|  | <a href="#">Quiz: RANSAC</a> 3 questions                       | May 8 | 3%  | ✓ | 100% |
|  | <a href="#">Quiz: 3D-3D Pose</a> 1 question                    | May 8 | 2%  | ✓ | 100% |
|  | <a href="#">Quiz: Pose Estimation</a> 4 questions              | May 8 | 3%  | ✓ | 100% |
|  | <a href="#">Programming Assignment: Image Projection</a> 3h    | May 8 | 11% | ✓ | 100% |

## Multi-View Geometry

|  |   |        |     |   |      |
|--|---|--------|-----|---|------|
|  | <a href="#">Quiz: Epipolar Geometry</a> 12 questions              | May 15 | 5%  | ✓ | 96%  |
|  | <a href="#">Quiz: Nonlinear Least Squares</a> 6 questions         | May 15 | 3%  | ✓ | 100% |
|  | <a href="#">Quiz: 3D Velocities from Optical Flow</a> 3 questions | May 15 | 3%  | ✓ | 100% |
|  | <a href="#">Quiz: Bundle Adjustment</a> 5 questions               | May 15 | 3%  | ✓ | 100% |
|  | <a href="#">Programming Assignment: Structure from Motion</a> 3h  | May 15 | 11% | ✓ | 100% |

(<https://accounts.coursera.org/i/zendesk>)



Home

(</learn/robotics-perception/home/welcome>)

Course Content

(</learn/robotics-perception/home/week/>)

Assignments

(</learn/robotics-perception/home/assignments>)

Discussions

(</learn/robotics-perception/discussions>)

Resources

(</learn/robotics-perception/resources/Wpo75>)

Course Info

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[Upgrade](#)

25/25

Assignments Passed

99.7%

Final Grade

|  | Due | Passed | Grade |
|--|-----|--------|-------|
|--|-----|--------|-------|

### Geometry of Image Formation

Quiz: Introduction 7 questions Apr 25 ✓ 96%

(</learn/robotics-perception/exam/jPG8n/introduction>)

Quiz: Vanishing Points 5 questions Apr 25 ✓ 100%

(</learn/robotics-perception/exam/KddZ8/vanishing-points>)

Quiz: Perspective Projection 5 questions Apr 25 ✓ 100%





02/20/2018

## Sandipan Dey

has successfully completed

### Sequence Models

an online non-credit course authorized by deeplearning.ai and offered through  
Coursera

A handwritten signature in blue ink that appears to read "Andrew Ng".

Adjunct Professor Andrew Ng  
Computer Science

## COURSE CERTIFICATE



Verify at [coursera.org/verify/3YQXBRML7KPU](https://coursera.org/verify/3YQXBRML7KPU)

Coursera has confirmed the identity of this individual and  
their participation in the course.

DECEMBER 06, 2012

# Statement of Accomplishment

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED



### Social Network Analysis

This interdisciplinary course uses social network analysis to understand how networks form, how they are structured, and how this structure influences processes occurring over networks.



---

LADA ADAMIC  
ADJUNCT ASSOCIATE PROFESSOR  
SCHOOL OF INFORMATION, CENTER FOR THE STUDY OF COMPLEX SYSTEMS  
UNIVERSITY OF MICHIGAN

PLEASE NOTE: THE ONLINE OFFERING OF THIS CLASS DOES NOT REFLECT THE ENTIRE CURRICULUM OFFERED TO STUDENTS ENROLLED AT THE UNIVERSITY OF MICHIGAN. THIS STATEMENT DOES NOT AFFIRM THAT THIS STUDENT WAS ENROLLED AS A STUDENT AT THE UNIVERSITY OF MICHIGAN IN ANY WAY. IT DOES NOT CONFER A UNIVERSITY OF MICHIGAN GRADE; IT DOES NOT CONFER UNIVERSITY OF MICHIGAN CREDIT; IT DOES NOT CONFER A UNIVERSITY OF MICHIGAN DEGREE; AND IT DOES NOT VERIFY THE IDENTITY OF THE STUDENT.



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Social Network Analysis Using R

Course completed on May 29, 2020 • 1 hour 6 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AeALGO-3-QQWGFjQhl6ZTEzAP7Q-

JUNE 18, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### Statistical Inference

Students receive a broad overview of the goals, assumptions, and modes of statistical inference. Successful students can perform inferential tasks in highly targeted settings and are able to use the skills developed for more complex inferential challenges.

*Brian Caaffo*

---

BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

---

JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



---

*Roger D. Peng*  
ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

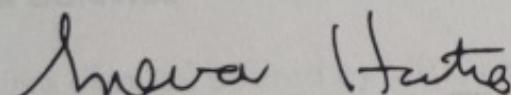
April 8th, 2014

This is to certify that,

**Sandipan Dey**

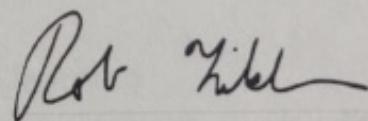
has successfully completed a free online offering of

**Statistical Learning**



**Trevor Hastie**

John A Overdeck Professor of Statistics  
Stanford University



**Rob Tibshirani**

Professor in Health Research and Policy and Statistics  
Stanford University

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Authenticity of this statement of accomplishment can be verified at: <https://verify.class.stanford.edu/SOA/b7ffc3be183a49ee9adbcd47b2b27a98>



02/20/2018

## Sandipan Dey

has successfully completed

### Structuring Machine Learning Projects

an online non-credit course authorized by deeplearning.ai and offered through Coursera

A handwritten signature in blue ink that appears to read "Andrew Ng".

Adjunct Professor Andrew Ng  
Computer Science

## COURSE CERTIFICATE



Verify at [coursera.org/verify/6M98Y3P26D99](https://coursera.org/verify/6M98Y3P26D99)

Coursera has confirmed the identity of this individual and  
their participation in the course.



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

# Text Analytics and Predictions with R Essential Training

Course completed on May 30, 2020 • 40 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AQy298\_yoEX\_XGyPRdvcld8TgK1Sv



Sandipan Dey &lt;sandipan.dey@gmail.com&gt;

## Text Mining and AnalyticsCourse Mastery Badge

1 message

**Text Retrieval and Search Engines Course Staff** <no-reply@illinois.edu>

Reply-To: Replies will not be read &lt;no-reply-webservices@illinois.edu&gt;

To: sandipan.dey@gmail.com

Fri, Jul 17, 2015 at 9:24 PM

**UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN**

Hello Sandipan Dey,

Congratulations on earning the **Course Mastery Badge** for your efforts in the Text Mining and Analytics course offered by the [University of Illinois at Urbana-Champaign](#)! Your average total score of 90% or higher on the quizzes in this course qualified you for this badge.

As a special reward, we would like to include your name in the [Hall of Fame](#) page to be posted within the course and future offerings of the course. To do so, please [fill out this form by Friday, August 7, 2015](#), and we will add your name to the Hall of Fame. Your email address will NOT be shared on the Hall of Fame page.

Thank you for your active participation in this course. I wish you the best!

ChengXiang Zhai  
Professor, Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



**Course  
Mastery  
Badge**

[University Administration](#)[Urbana Campus](#)[Chicago Campus](#)[Springfield Campus](#)



Sandipan Dey <sandipan.dey@gmail.com>

## Text Mining and Analytics Programming Mastery Badge

1 message

Text Mining and Analytics Course Staff <no-reply@illinois.edu>  
Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>  
To: sandipan.dey@gmail.com

Fri, Jul 17, 2015 at 9:26 PM

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Hello Sandipan Dey,

Congratulations on earning the **Programming Mastery Badge** for your efforts in the Text Mining and Analytics course offered by the [University of Illinois at Urbana-Champaign](#)! Your average score of 90% or higher on the programming assignment in this course qualified you for this badge.

Thank you for your active participation in this course. I wish you the best!

ChengXiang Zhai  
Professor, Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



**Programming Mastery  
Badge**



Sandipan Dey &lt;sandipan.dey@gmail.com&gt;

## Text Mining and Analytics Programming Mastery Badge

1 message

**Text Mining and Analytics Course Staff** <no-reply@illinois.edu>  
Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>  
To: sandipan.dey@gmail.com

Fri, Jul 17, 2015 at 9:26 PM

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Hello Sandipan Dey,

Congratulations on earning the **Programming Mastery Badge** for your efforts in the Text Mining and Analytics course offered by the [University of Illinois at Urbana-Champaign](#)! Your average score of 90% or higher on the programming assignment in this course qualified you for this badge.

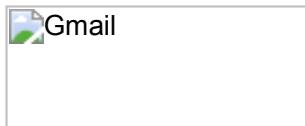
Thank you for your active participation in this course. I wish you the best!

ChengXiang Zhai  
Professor, Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



## Programming Mastery Badge





Sandipan Dey &lt;sandipan.dey@gmail.com&gt;

## Text Mining Programming Competition Leader Badge

1 message

**Text Mining and Analytics Course Staff** <no-reply@illinois.edu>  
Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>  
To: sandipan.dey@gmail.com

Fri, Jul 17, 2015 at 9:26 PM

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Hello Sandipan Dey,

Congratulations on earning the **Text Mining Programming Competition Leader Badge** for your efforts in the Text Mining and Analytics course offered by the [University of Illinois at Urbana-Champaign](#)! You ranked in the top 5% of the class, which qualified you for this badge.

Thank you for your active participation in this course. I wish you the best!

ChengXiang Zhai  
Professor, Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



## Text Mining Programming Competition Leader Badge

[University Administration](#)

[Urbana Campus](#)

[Chicago Campus](#)

[Springfield Campus](#)





Sandipan Dey <sandipan.dey@gmail.com>

---

## Text Mining Programming Competition Leader Badge

1 message

**Text Mining and Analytics Course Staff** <no-reply@illinois.edu>  
Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>  
To: sandipan.dey@gmail.com

Fri, Jul 17, 2015 at 9:26 PM

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Hello Sandipan Dey,

Congratulations on earning the **Text Mining Programming Competition Leader Badge** for your efforts in the Text Mining and Analytics course offered by the [University of Illinois at Urbana-Champaign](#)! You ranked in the top 5% of the class, which qualified you for this badge.

Thank you for your active participation in this course. I wish you the best!

ChengXiang Zhai  
Professor, Department of Computer Science  
University of Illinois at Urbana-Champaign



## Text Mining Programming Competition Leader Badge



Sandipan Dey &lt;sandipan.dey@gmail.com&gt;

## Course Mastery Badge

1 message

**Text Retrieval and Search Engines Course Staff** <no-reply@illinois.edu>

Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>

To: sandipan.dey@gmail.com

Sat, May 9, 2015 at 7:46 PM

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Hello Sandipan Dey,

Congratulations on earning the **Course Mastery Badge** for your efforts in the Text Retrieval and Search Engines course offered by the [University of Illinois at Urbana-Champaign](#)! Your average total score of 90% or higher on the quizzes in this course qualified you for this badge.

As a special reward, we would like to include your name in the [Hall of Fame](#) page to be posted within the course and future offerings of the course. To do so, please [fill out this form by Friday, May 15, 2015](#), and we will add your name to the Hall of Fame. Your email address will NOT be shared on the Hall of Fame page.

Thank you for your active participation in this course. I wish you the best!

ChengXiang Zhai  
Professor, Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



Course  
Mastery  
Badge

[University Administration](#)[Urbana Campus](#)[Chicago Campus](#)[Springfield Campus](#)



Sandipan Dey <sandipan.dey@gmail.com>

---

## Programming Competition Leader Badge

1 message

---

**Text Retrieval and Search Engines Course Staff** <no-reply@illinois.edu>

Reply-To: Replies will not be read <no-reply-webservices@illinois.edu>

To: sandipan.dey@gmail.com

Sat, May 9, 2015 at 8:02 PM

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Hello Sandipan Dey,

Congratulations on earning the **Programming Competition Leader Badge** for your efforts in the Text Retrieval and Search Engines course offered by the [University of Illinois at Urbana-Champaign](#)! You ranked in the top 15% of the class, which qualified you for this badge.

Thank you for your active participation in this course. I wish you the best!

ChengXiang Zhai  
Professor, Department of Computer Science  
University of Illinois at Urbana-Champaign



## Programming Competition Leader Badge



Sandipan Dey &lt;sandipan.dey@gmail.com&gt;

## Programming Competition Leader Badge

1 message

**Text Retrieval and Search Engines Course Staff** <no-reply@illinois.edu>

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Sat, May 9, 2015 at 8:02 PM

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Thank you for your active participation in this course. I wish you the best!

ChengXiang Zhai  
Professor, Department of Computer Science  
[University of Illinois at Urbana-Champaign](#)



## Programming Competition Leader Badge

[University Administration](#)

[Urbana Campus](#)

[Chicago Campus](#)

[Springfield Campus](#)



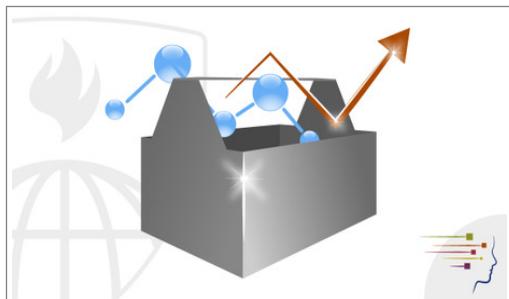
MAY 08, 2014

# Statement of Accomplishment

WITH DISTINCTION

## SANDIPAN DEY

HAS SUCCESSFULLY COMPLETED THE JOHNS HOPKINS UNIVERSITY'S OFFERING OF



### The Data Scientist's Toolbox

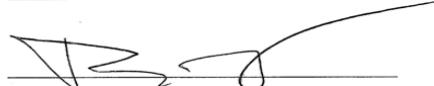
Overview of the data, questions, & tools that data analysts & scientists work with. It is a conceptual introduction to the ideas behind turning data into knowledge as well as a practical introduction to tools like version control, markdown, git, GitHub, R, and RStudio.

---



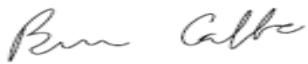
JEFFREY LEEK, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

---



ROGER D. PENG, PHD  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH

---



BRIAN CAFFO, PHD, MS  
DEPARTMENT OF BIOSTATISTICS, JOHNS HOPKINS  
BLOOMBERG SCHOOL OF PUBLIC HEALTH



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Transfer Learning for Images Using PyTorch: Essential Training

Course completed on May 27, 2020 • 58 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

  
Tanya Stanley  
VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AcrlJ\_ojkBvKWLKaUah8FUi8JdzI



LinkedIn LEARNING

## Certificate of Completion

Congratulations, Sandipan Dey

### Visual Studio Code for Python Developers

Course completed on Jun 10, 2020 • 59 min

By continuing to learn, you have expanded your perspective, sharpened your skills, and made yourself even more in demand.

A handwritten signature in cursive script that reads "Tanya Staples".

VP, Learning Content at LinkedIn

LinkedIn Learning  
1000 W Maude Ave  
Sunnyvale, CA 94085

Certificate Id: AQdma0WWbiSlBZDlRl6811u\_mgTV

DECEMBER 05, 2012

# Statement of Accomplishment

WITH DISTINCTION

# SANDIPAN DEY

HAS COMPLETED



## Web Intelligence and Big Data

This course is about building 'web-intelligence' applications exploiting big data sources arising social media, mobile devices and sensors, using new big-data platforms based on the 'map-reduce' parallel programming paradigm.

A handwritten signature in black ink, appearing to read 'Gautam Shroff'.

---

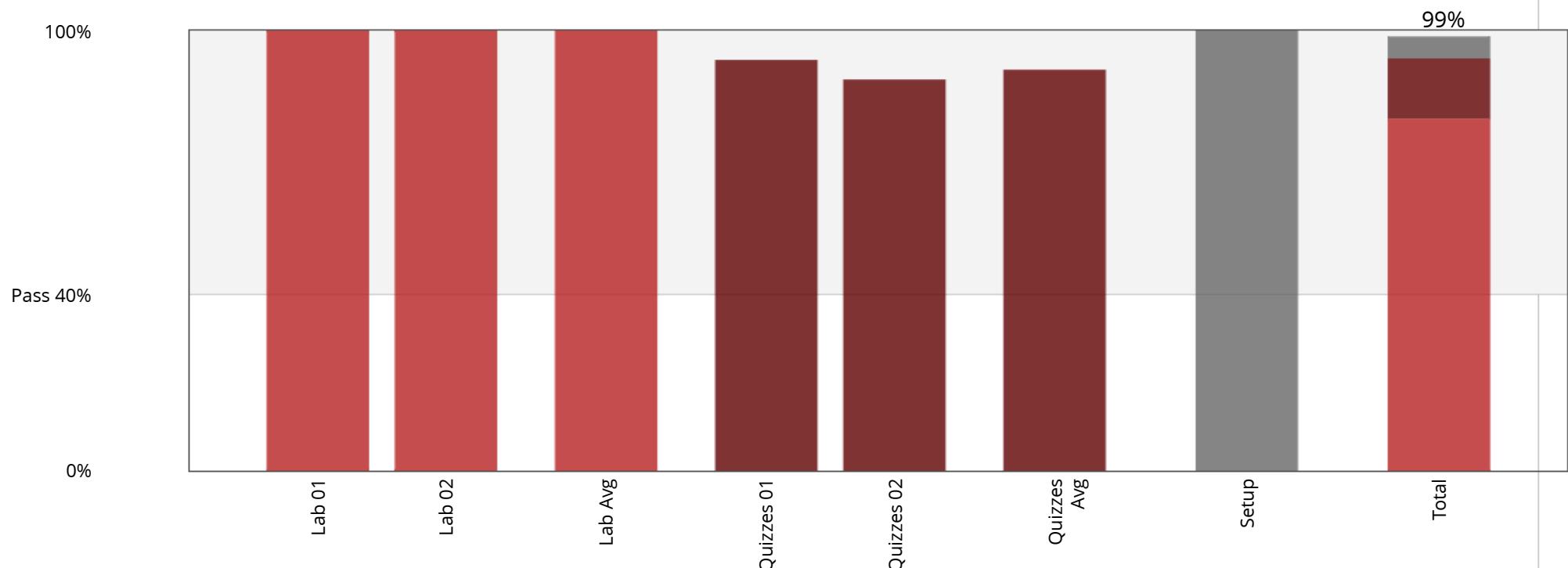
DR. GAUTAM SHROFF  
VICE PRESIDENT & CHIEF SCIENTIST  
TCS INNOVATION LABS  
TATA CONSULTANCY SERVICES



## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Your enrollment: Audit track**

You are enrolled in the audit track for this course. The audit track does not include a certificate.



Week 1 - Apache  
Spark Programming

Lecture 1: Apache Spark Architecture and Programming Model (14/15) 93%  
Quizzes

**Model**

Problem Scores: 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

**Setting up the Course Software Environment (Due September 10, 2016 at 23:59 UTC)**

(100/100) 100%

Setup

Problem Scores: 100/100

**(Optional) Survey about your machine and setup experience**

None

Practice Scores: 0/0

---

**Week 2 - The Structured Query Language and Spark SQL****Lecture 2: The Structured Query Language and Spark SQL (8/9) 89%**

Quizzes

Problem Scores: 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1

**Lab 1A/1B - Learning Apache Spark (Due September 10, 2016 at 23:59 UTC) (100/100)**

100%

Lab

Problem Scores: 100/100

---

**Week 3 - Analyzing Semi-Structured Data with Apache Spark****Lab 2 - Web Server Log Analysis with Apache Spark (Due September 10, 2016 at 23:59 UTC) (100/100) 100%**

Lab

Problem Scores: 100/100



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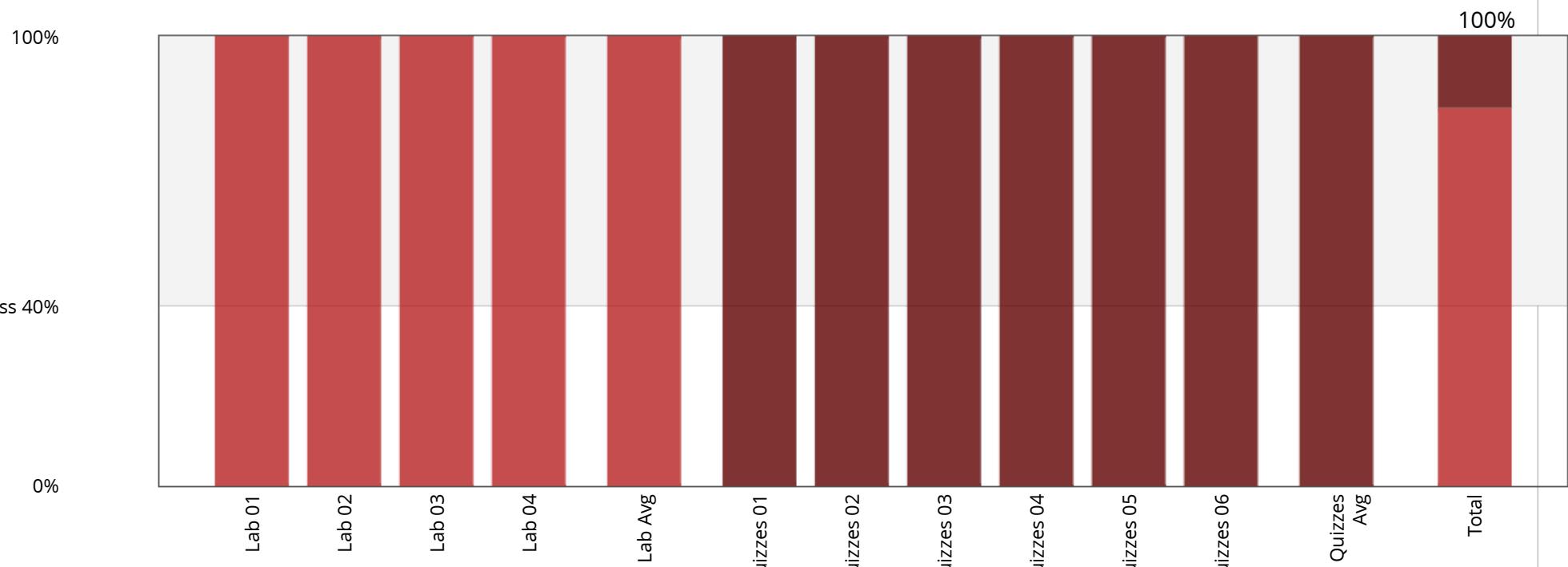




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Your enrollment: Audit track**

You are enrolled in the audit track for this course. The audit track does not include a certificate.



Week 1 - Big Data  
and Data Science

Lecture 1: Big Data and Data Science (16/16) 100%  
Quizzes

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Setting up the Course Software Environment

Setup

No problem scores in this section

### Lab 1: Power Plant Machine Learning Pipeline (100/100) 100%

Lab due Sep 12, 2016 at 23:00 UTC

Problem Scores: 100/100

### Lab 1 Quiz Questions (4/4) 100%

Quizzes

Problem Scores: 1/1 1/1 1/1 1/1

---

## Week 2 - Performing Data Science

### Lecture 2: Performing Data Science and Preparing Data (10/10) 100%

Quizzes

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lab 2 - Movie Rating Prediction using Alternating Least Squares (100/100) 100%

Lab due Sep 12, 2016 at 23:00 UTC

Problem Scores: 100/100

### Lab 2 Quiz Questions (3/3) 100%

Quizzes

Problem Scores: 1/1 1/1 1/1

## Week 3 - Programming with Resilient Distributed Datasets

### Lecture 3: Apache Spark Resilient Distributed Datasets (10/10) 100%

Quizzes

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lab3a - RDD Tutorial (100/100) 100%

Lab due Sep 12, 2016 at 23:00 UTC

Problem Scores: 100/100

### Lab 3b - Text Analysis and Entity Resolution (100/100) 100%

Lab due Sep 12, 2016 at 23:00 UTC

Problem Scores: 100/100

### Lab 3b Quiz Questions (6/6) 100%

Quizzes

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1



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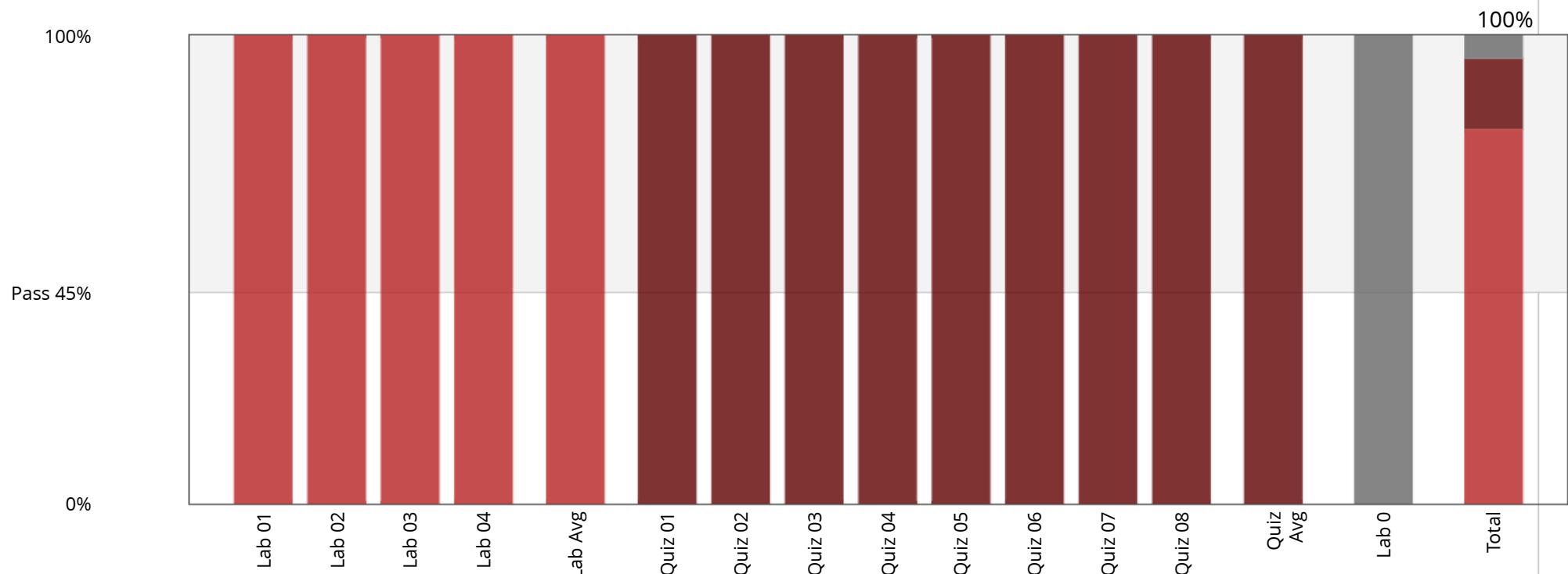




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Your enrollment: Audit track**

You are enrolled in the audit track for this course. The audit track does not include a certificate.



Week 1 - Course  
Overview, Software

Syllabus Quiz (5/5) 100%  
Quiz due Aug 08, 2016 at 23:00 UTC

## Setup, and Machine Learning Basics

Problem Scores: 1/1 1/1 1/1 1/1 1/1

### Setting up the Course Software Environment (100/100) 100%

*Lab 0 due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 100/100

### (Optional) Survey about your Machine and Setup Experience

None

Practice Scores: 0/0

### Lecture 1: Course Overview and Introduction to Machine Learning (7/7) 100%

*Quiz due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lab1a/Lab1b - Math and Python Review and RDD overview (100/100) 100%

*Lab due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 50/50 50/50

## Week 2 - Linear Regression and Distributed Machine Learning Principles

### Lecture 2: Linear Regression and Distributed ML Principles (7/7) 100%

*Quiz due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lab2 - Millionsong Regression Pipeline (100/100) 100%

*Lab due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 100/100

### Lab2 Quiz (8/8) 100%

*Quiz due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

---

## Week 3 - Logistic Regression and Click-through Rate Prediction

### Lecture 3: Logistic Regression and Click-through Rate Prediction (11/11) 100%

*Quiz due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lab3 - Click-through Rate Prediction Pipeline (100/100) 100%

*Lab due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 100/100

### Lab3 Quiz (13/13) 100%

*Quiz due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 3/3 3/3 1/1

---

## Week 4 - Principal Component Analysis and Neuroimaging

### Lecture 4: Principal Component Analysis and Neuroimaging (11/11) 100%

*Quiz due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lab4 - Neuroimaging Analysis via PCA (100/100) 100%

*Lab due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 100/100

### Lab4 Quiz (9/9) 100%

*Quiz due Aug 08, 2016 at 23:00 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1



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# HONOR CODE CERTIFICATE



**Ameet Talwalkar**

Assistant Professor of Computer Science  
*University of California, Los Angeles*

Visiting Assistant Professor  
Department of Electrical Engineering  
and Computer Science  
*University of California, Berkeley*

Technical Advisor  
*Databricks*

# Sandipan Dey

successfully completed and received a passing grade in

## CS190.1x: Scalable Machine Learning

a course of study offered by BerkeleyX, an online learning  
initiative of The University of California, Berkeley through edX.

**HONOR CODE CERTIFICATE**  
Issued August 06, 2015

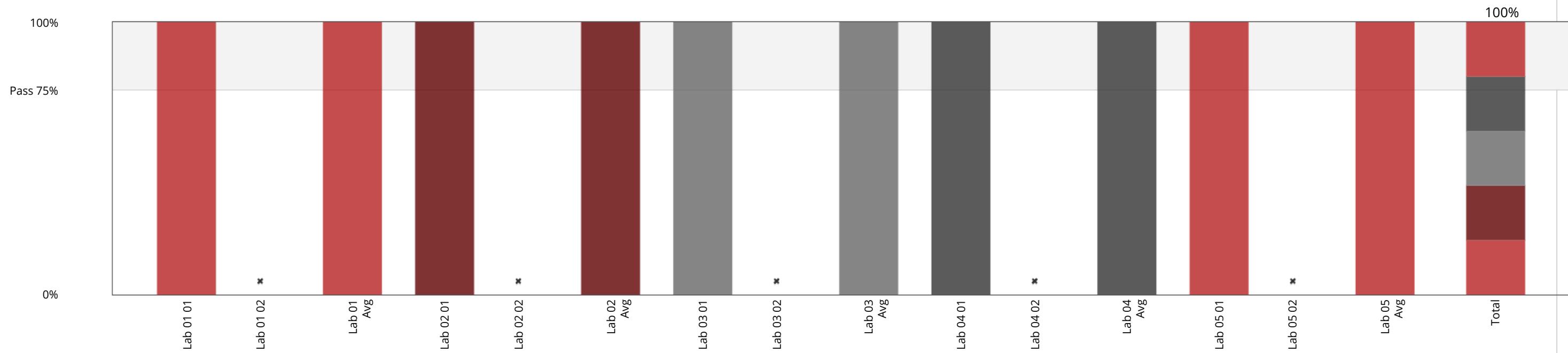
Verify the authenticity of this certificate at  
<https://verify.edx.org/cert/9595d5c53e2144dcba99caa7b3b31447a>



## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Required Reading and Information

#### Syllabus

No problem scores in this section

#### Frequently Asked Questions

No problem scores in this section

#### [Optional] Non-notebook Workflow

No problem scores in this section

### Week 1

[Section 1: Introduction \(Lec 1.1 - Lec 1.6\)](#)

No problem scores in this section

[Introduction and Practice with Jupyter Notebooks](#)

No problem scores in this section

[Section 2: Cause and Effect \(Lec 2.1 - Lec 2.4\)](#)

No problem scores in this section

[Reading and Practice for Section 2](#)

Practice Scores: 0/0

[Section 3a: Python \(Lec 3.1 - Lec 3.3\)](#)

No problem scores in this section

[Reading and Practice for Section 3a](#)

Practice Scores: 0/0 0/0

[Section 3b: Tables \(Lec 3.4 - Lec 3.7\)](#)

No problem scores in this section

[Reading and Practice for Section 3b](#)

Practice Scores: 0/0

[Lab 1: Introduction to Python \(Jupyter Notebook\)](#) (20/20) 100%

Lab 01 due Apr 27, 2018 17:29 IST

Problem Scores: 20/20

[Alternative Lab 1: Introduction to Python \(Non-Notebook Version\)](#) (0/20)

Lab 01 due Apr 27, 2018 17:29 IST

Problem Scores: 0/20

---

Week 2

[Section 4: Expressions \(Lec 4.1 - Lec 4.5\)](#)

No problem scores in this section

[Reading and Practice for Section 4](#)

Practice Scores: 0/0

[Section 5a: Strings \(Lec 5.1 - Lec 5.4\)](#)

No problem scores in this section

[Reading and Practice for Section 5a](#)

Practice Scores: 0/0

[Section 5b: Minrad's Map \(Lec 5.5 - Lec 5.6\)](#)

No problem scores in this section

[Section 5c: Building Tables \(Lec 5.7 - Lec 5.9\)](#)

No problem scores in this section

[Reading and Practice for Section 5c](#)

Practice Scores: 0/0

[Lab 2: Data Types \(Jupyter Notebook\)](#) (20/20) 100%

Lab 02 due Apr 27, 2018 17:29 IST

Problem Scores: 20/20

[Alternative Lab 2: Data Types \(Non-Notebook Workflow\)](#) (0/20)

Lab 02 due Apr 27, 2018 17:29 IST

Problem Scores: 0/20

---

Week 3

[Section 6: Census \(Lec 6.1 - Lec 6.4\)](#)

No problem scores in this section

[Reading and Practice for Section 6](#)

Practice Scores: 0/0

[Section 7: Charts \(Lec 7.1 - 7.8\)](#)

No problem scores in this section

[Reading and Practice for Section 7](#)

Practice Scores: 0/0

[Section 8: Histograms \(Lec 8.1 - Lec 8.7\)](#)

No problem scores in this section

[Reading and Practice for Section 8](#)

Practice Scores: 0/0

[Lab 3: Tables \(Jupyter Notebook\)](#) (20/20) 100%

Lab 03 due Apr 30, 2018 17:29 IST

Problem Scores: 20/20

[Alternative Lab 3: Tables \(Non-Notebook Workflow\)](#) (0/20)

Lab 03 due Apr 30, 2018 17:29 IST

Problem Scores: 0/20

---

Week 4

[Section 9a: Comparing Histograms \(Lec 9.1 - Lec 9.2\)](#)

No problem scores in this section

[Section 9b: Functions \(Lec 9.3 - Lec 9.6\)](#)

No problem scores in this section

[Reading and Practice for Section 9b](#)

Practice Scores: 0/0

[Section 10a: Groups \(Lec 10.1 - Lec 10.3\)](#)

No problem scores in this section

[Reading and Practice for Section 10a](#)

Practice Scores: 0/0

[Section 10b: Pivot \(Lec 10.4 - Lec 10.6\)](#)

No problem scores in this section

[Reading and Practice for Section 10b](#)

Practice Scores: 0/0

[Section 11: Joins \(Lec 11.1 - Lec 11.4\)](#)

No problem scores in this section

[Reading and Practice for Section 11](#)

Practice Scores: 0/0

[Lab 4: Functions and Visualizations \(Jupyter Notebook\)](#) (20/20) 100%

Lab 04 due May 7, 2018 17:29 IST

Problem Scores: 20/20

[Alternative Lab 4: Functions and Visualizations \(Non-Notebook Workflow\)](#) (0/20)

Lab 04 due May 7, 2018 17:29 IST

Problem Scores: 0/20

---

Week 5

[Section 12: Table Examples \(Lec 12.1 - Lec 12.4\)](#)

No problem scores in this section

[Reading and Practice for Section 12](#)

Practice Scores: 0/0

[Section 13: Iteration \(Lec 13.1 - Lec 13.7\)](#)

No problem scores in this section

[Reading and Practice for Section 13](#)

Practice Scores: 0/0

[Lab 5: World Progress \(Jupyter Notebook\)](#) (20/20) 100%

Lab 05 due May 14, 2018 17:29 IST

Problem Scores: 20/20

[Alternative Lab 5: World Progress \(Non-Notebook Workflow\)](#) (0/20)

Lab 05 due May 14, 2018 17:29 IST

Problem Scores: 0/20

---

Optional Additional Content  
(Verified Track Only)

[Optional Lab: More World Progress \(Jupyter Notebook\)](#)

No problem scores in this section

[Alternative Optional Lab: More World Progress \(Non-Notebook Workflow\)](#)

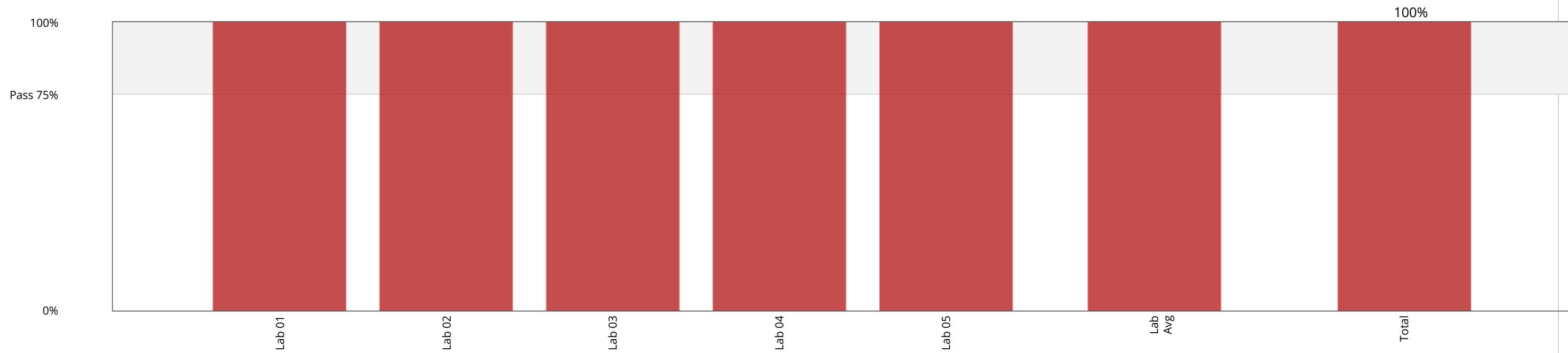
No problem scores in this section



## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Required Reading and Information

#### [Syllabus](#)

No problem scores in this section

### Week 1

[Section 1: Introduction \(Lec 1.1 - Lec 1.2\)](#)

No problem scores in this section

[Section 2: Probability \(Lec 2.1 - Lec 2.5\)](#)

No problem scores in this section

[Reading and Practice for Section 2](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0

[\[Review\] Section 3: Iteration \(Lec 3.1 - Lec 3.7\)](#)

No problem scores in this section

[\[Review\] Reading and Practice for Section 3](#)

Practice Scores: 0/0

[Lab 1: Randomization](#) (20/20) 100%

Lab due Jun 27, 2018 17:29 IST

Problem Scores: 20/20

## Week 2

[Section 4a: Sampling \(Lec 4.1 - Lec 4.2\)](#)

No problem scores in this section

[Reading and Practice for Section 4a](#)

Practice Scores: 0/0

[Section 4b: Simulation \(Lec 4.3 - Lec 4.6\)](#)

No problem scores in this section

[Reading and Practice for Section 4b](#)

Practice Scores: 0/0

[Section 5: Hypothesis Testing \(Lec 5.1 - Lec 5.4\)](#)

No problem scores in this section

[Reading and Practice for Section 5](#)

Practice Scores: 0/0

[Lab 2: Sampling](#) (20/20) 100%

Lab due Jun 27, 2018 17:29 IST

Problem Scores: 20/20

## Week 3

[Section 6: Comparing Distributions \(Lec 6.1 - Lec 6.4\)](#)

No problem scores in this section

[Reading and Practice for Section 6](#)

Practice Scores: 0/0

[Section 7: Decisions and Uncertainty \(Lec 7.1 - Lec 7.5\)](#)

No problem scores in this section

[Reading and Practice for Section 7](#)

Practice Scores: 0/0

[Lab 3: Inference, Part 1](#) (20/20) 100%

Lab due Jun 27, 2018 17:29 IST

Problem Scores: 20/20

## Week 4

[Section 8a: A/B Testing \(Lec 8.1 - Lec 8.3\)](#)

No problem scores in this section

[Reading and Practice for Section 8a](#)

Practice Scores: 0/0

[Section 8b: Deflategate Example \(Lec 8.4 - Lec 8.5\)](#)

No problem scores in this section

[Section 9: Causality \(Lec 9.1 - Lec 9.4\)](#)

No problem scores in this section

[Reading and Practice for Section 9](#)

Practice Scores: 0/0

[Lab 4: Inference, Part 2](#) (20/20) 100%

Lab due Jun 27, 2018 17:29 IST

Problem Scores: 20/20

## Week 5

[Section 10: Confidence Intervals \(Lec 10.1 - Lec 10.4\)](#)

No problem scores in this section

[Reading and Practice for Section 10](#)

Practice Scores: 0/0

[Section 11: Interpreting Confidence \(Lec 11.1 - Lec 11.3\)](#)

No problem scores in this section

[Reading and Practice for Section 11](#)

Practice Scores: 0/0

[Lab 5: Bootstrap](#) (20/20) 100%

Lab due Jun 27, 2018 17:29 IST

Problem Scores: 20/20

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Optional Additional Content  
(Verified Track Only)

[Optional Additional Content \(Verified Track Only\)](#)

No problem scores in this section

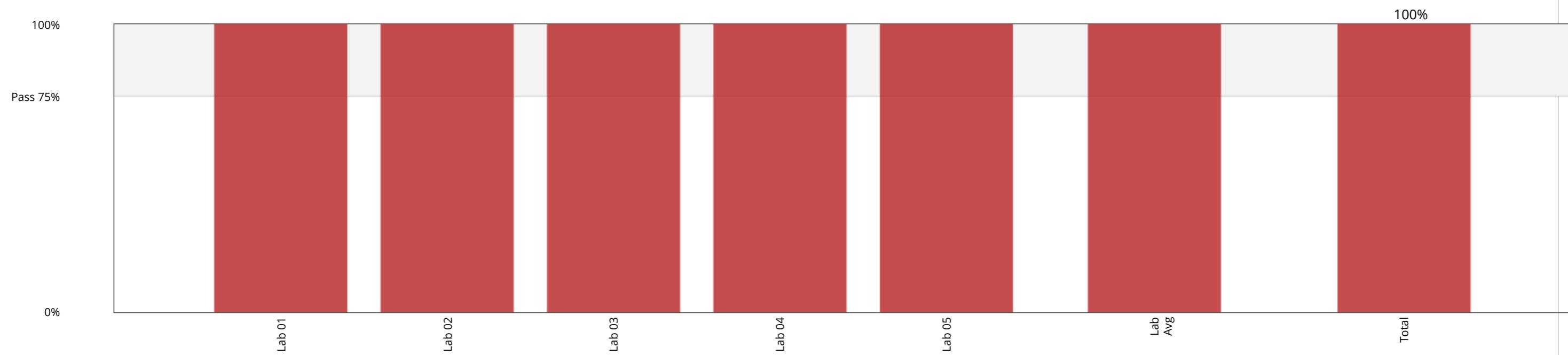


**⚠** System maintenance is scheduled for Wednesday, August 29, 2018 from 14:30-15:30 UTC. Courses might not be available during this time.

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Required Reading and Information

#### [Syllabus](#)

No problem scores in this section

### Week 1

[Section 1: Center and Spread \(Lec 1.1 - Lec 1.4\)](#)

No problem scores in this section

[Reading and Practice for Section 1](#)

Practice Scores: 0/0

[Section 2: Normal Curve \(Lec 2.1 - Lec 2.4\)](#)

No problem scores in this section

[Reading and Practice for Section 2](#)

Practice Scores: 0/0

[Section 3: Correlation \(Lec 3.1 - Lec 3.3\)](#)

No problem scores in this section

[Reading and Practice for Section 3](#)

Practice Scores: 0/0

[Lab 1: Sample Means and Correlation](#) (20/20) 100%

Lab due Sep 17, 2018 17:29 IST

Problem Scores: 20/20

[\[SJCC\] Homework 9: Central Limit Theorem](#)

No problem scores in this section

---

Week 2

[Section 4: Regression \(Lec 4.1 - Lec 4.5\)](#)

No problem scores in this section

[Reading and Practice for Section 4](#)

Practice Scores: 0/0

[Section 5: Least Squares \(Lec 5.1 - Lec 5.4\)](#)

No problem scores in this section

[Reading and Practice for Section 5](#)

Practice Scores: 0/0

[Lab 2: Regression](#) (20/20) 100%

Lab due Sep 17, 2018 17:29 IST

Problem Scores: 20/20

[\[SJCC\] Homework 10: Linear Regression](#)

No problem scores in this section

## Week 3

[Section 6: Residuals \(Lec 6.1 - Lec 6.4\)](#)

No problem scores in this section

[Reading and Practice for Section 6](#)

Practice Scores: 0/0

[Section 7: Regression Inference \(Lec 7.1 - Lec 7.3\)](#)

No problem scores in this section

[Reading and Practice for Section 7](#)

Practice Scores: 0/0

[Lab 3: Regression Inference](#) (20/20) 100%

Lab due Sep 17, 2018 17:29 IST

Problem Scores: 20/20

[\[SJCC\] Homework 11: Regression](#)

No problem scores in this section

## Week 4

[Section 8: Classification \(Lec 8.1 - Lec 8.3\)](#)

No problem scores in this section

[Reading and Practice for Section 8](#)

Practice Scores: 0/0

[Section 9: Classifiers \(Lec 9.1 - Lec 9.6\)](#)

No problem scores in this section

[Reading and Practice for Section 9](#)

Practice Scores: 0/0

[Lab 4: Classification Part 1](#) (20/20) 100%

Lab due Sep 17, 2018 17:29 IST

Problem Scores: 20/20

[\[SJCC\] Homework 12: Classification](#)

No problem scores in this section

## Week 5

[Section 10: Privacy \(Lec 10.1 - Lec 10.5\)](#)

No problem scores in this section

[Section 11: Data Science Case Study \(Lec 11.1 - Lec 11.7\)](#)

No problem scores in this section

[Lab 5: Classification Part 2](#) (20/20) 100%

Lab due Sep 17, 2018 17:29 IST

Problem Scores: 20/20

# HONOR CODE CERTIFICATE



**Yaser S. Abu-Mostafa**

Professor of Electrical Engineering and Computer  
Science, *California Institute of Technology*

# Sandipan Dey

successfully completed and received a passing grade in

## CS1156x: Learning From Data

a non-credit course offered by CaltechX, an online learning  
initiative of California Institute of Technology through edX.

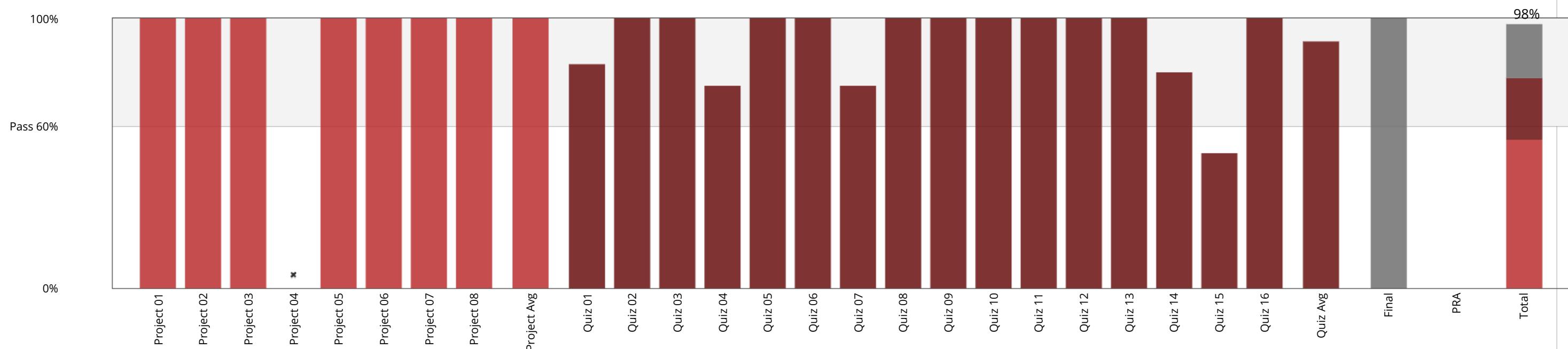
**HONOR CODE CERTIFICATE**  
Issued December 9th, 2013

Verify the authenticity of this certificate at  
<https://verify.edx.org/cert/94438797fe4245caafc71f176762937f>

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



Analytics in Python Course:  
Getting Started

### Course Description

No problem scores in this section

### Course Information and Support

No problem scores in this section

### Software Setup Instructions

No problem scores in this section

### Welcome Message from Professor Hardeep Johar

No problem scores in this section

### Pre-Course Survey

No problem scores in this section

Week 1: A Crash Course in  
Python Part 1

### 1.1 Python Data Types

No problem scores in this section

### 1.2 Strings in Python

No problem scores in this section

### 1.3 Variables and Values

No problem scores in this section

### 1.4 Boolean Types in Python

No problem scores in this section

### 1.5 Assignment Operations

No problem scores in this section

### 1.6 The if Statement

No problem scores in this section

### Quiz 1.1 (5/6) 83%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 0/1 1/1 1/1

### 1.7 Functions (Part 1)

No problem scores in this section

### 1.8 Functions (Part 2)

No problem scores in this section

### Quiz 1.2 (4/4) 100%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1

### Week 1 Assignment (String manipulation) (100/100) 100%

Project due Apr 23, 2018 05:00 IST

Problem Scores: 100/100

### Week 1 Discussion Questions

No problem scores in this section

Week 2: A Crash Course in  
Python Part 2

### 2.1 Lists

No problem scores in this section

### 2.2 Mutability

No problem scores in this section

### [2.3 Iteration](#)

No problem scores in this section

#### [Quiz 2.1](#) (4/4) 100%

*Quiz due Apr 23, 2018 05:00 IST*

Problem Scores: 1/1 1/1 1/1 1/1

### [2.4 Example](#)

No problem scores in this section

### [2.5 Dictionaries and sets](#)

No problem scores in this section

#### [Quiz 2.2](#) (3/4) 75%

*Quiz due Apr 23, 2018 05:00 IST*

Problem Scores: 1/1 0/1 1/1 1/1

### [2.6 datetime library I](#)

No problem scores in this section

### [2.7 datetime library II](#)

No problem scores in this section

### [2.8 Example: Bucketing time Part I](#)

No problem scores in this section

### [2.9 Example: Bucketing time Part II](#)

No problem scores in this section

#### [Quiz 2.3](#) (4/4) 100%

*Quiz due Apr 23, 2018 05:00 IST*

Problem Scores: 1/1 1/1 1/1 1/1

### [Week 2 Assignment \(word count\)](#) (100/100) 100%

*Project due Apr 23, 2018 05:00 IST*

Problem Scores: 100/100

### [Week 2 Discussion Questions](#)

No problem scores in this section

## Week 3: Getting data from the Internet Part 1

### [3.1 Getting data \(Part 1\)](#)

No problem scores in this section

### [3.2 Getting data \(Part 2\)](#)

Practice Scores: 0/0

### [3.3 Web Data Formats](#)

No problem scores in this section

### [3.4 JSON, Google API \(Part 1\)](#)

No problem scores in this section

### [3.5 JSON, Google API \(Part 2\)](#)

No problem scores in this section

### [Quiz 3.1](#) (4/4) 100%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1

### [3.6 XML \(Part 1\)](#)

No problem scores in this section

### [3.7 XML \(Part 2\)](#)

No problem scores in this section

### [Quiz 3.2](#) (3/4) 75%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 0/1

## [Week 3 Discussion Questions](#)

No problem scores in this section

## Week 4: Getting data from the Internet Part 2

### [4.1 Getting data from the web \(Part 1\)](#)

No problem scores in this section

### [4.2 Getting data from the web \(Part 2\)](#)

No problem scores in this section

### [4.3 Web Scraping](#)

No problem scores in this section

### [4.4 BeautifulSoup4 \(Part 1\)](#)

No problem scores in this section

No problem scores in this section

#### 4.5 Beautiful Soup4 (Part 2)

No problem scores in this section

#### 4.6 Beautiful Soup4 (Part 3)

No problem scores in this section

#### 4.7 Epicurious example (Part 1)

No problem scores in this section

#### 4.8 Epicurious example (Part 2)

No problem scores in this section

#### 4.9 Epicurious example (Part 3)

No problem scores in this section

#### 4.10 Log into a Web Server (Part 1)

No problem scores in this section

#### 4.11 Log into a Web Server (Part 2)

No problem scores in this section

#### Quiz 4 (4/4) 100%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1    1/1    1/1    1/1

#### Week 4 (Optional) Assignment (HTML) (0/10)

Peer Review Assignment due Apr 23, 2018 05:00 IST

Problem Scores: 0/10

#### Week 4 Assignment (Google Finance) (100/100) 100%

Project due Apr 23, 2018 05:00 IST

Problem Scores: 100/100

#### Week 4 Discussion Questions

No problem scores in this section

---

Week 5: Database Basics

### 5.1 Basics of Databases (Part 1)

No problem scores in this section

### 5.2 Basics of Databases (Part 2)

No problem scores in this section

### 5.3 Basics of Databases (Part 3)

No problem scores in this section

### 5.4 Normalization (Part 1)

No problem scores in this section

### 5.5 Normalization (Part 2)

No problem scores in this section

### Quiz 5 (8/8) 100%

*Quiz due Apr 23, 2018 05:00 IST*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Week 5 Discussion Questions

No problem scores in this section

---

## Week 6: Database Basics: SQL

## Instructions for MySQL Setup

No problem scores in this section

### 6.1 Introduction to MySQL

No problem scores in this section

### 6.2 Introducing MySQL workbench

No problem scores in this section

### 6.3 DataBase Example (Part 1)

No problem scores in this section

### 6.4 DataBase Example (Part 2)

No problem scores in this section

### 6.5 Select Statement (Part 1)

No problem scores in this section

### 6.6 Select Statement (Part 2)

No problem scores in this section

### 6.7 Working across multiple tables (Part 1)

No problem scores in this section

### 6.8 Working across multiple tables (Part 2)

No problem scores in this section

### 6.9 SQL and Python (Part 1)

No problem scores in this section

### 6.10 SQL and Python (Part 2)

No problem scores in this section

## Week 6 Quiz (9/9) 100%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Week 6 Assignment (MySQL) (0/100)

Project due Apr 23, 2018 05:00 IST

Problem Scores: 0/100

## Week 6 Discussion Questions

No problem scores in this section

## Week 7: Data Analysis And Visualization: Part 1

### 7.1 Introduction to numpy

No problem scores in this section

### 7.2 numpy\_part 1

No problem scores in this section

### 7.3 numpy\_part 2

No problem scores in this section

### 7.4 numpy\_part 3

No problem scores in this section

### Week 7.1 Quiz (10/10) 100%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### 7.5 Introduction to pandas

No problem scores in this section

### 7.6 Pandas

No problem scores in this section

### 7.7 Pandas datareader

No problem scores in this section

### 7.8 Google Finance Data

No problem scores in this section

### 7.9 Time series analysis

No problem scores in this section

### 7.10 Example: Risk Return Analysis

No problem scores in this section

### 7.11 Example: Regression

No problem scores in this section

### Week 7.2 Quiz (10/10) 100%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Practice Proctored Exam (0/5)

due Apr 23, 2018 05:00 IST

Practice Scores: 0/5

### Week 7 Discussion Questions

No problem scores in this section

## Week 8: Data Analysis And Visualization: Part 2

### All files for Week 8

No problem scores in this section

#### 8.1 Data cleaning with pandas (Part 1)

No problem scores in this section

#### 8.2 Data cleaning with pandas (Part 2)

No problem scores in this section

#### 8.3 Data cleaning with pandas (Part 3)

No problem scores in this section

#### 8.4 Data cleaning with pandas (Part 4)

No problem scores in this section

#### 8.5 Data cleaning with pandas (Part 5)

No problem scores in this section

#### 8.6 Data cleaning with pandas (Part 6)

No problem scores in this section

#### 8.7 Data cleaning with pandas (Part 7)

No problem scores in this section

#### 8.8 Data visualization Part 1

No problem scores in this section

#### 8.9 Data visualization Part 2

No problem scores in this section

#### 8.10 Groupby function pandas

No problem scores in this section

#### 8.11 Data visualization Part 3

No problem scores in this section

#### 8.12 Data visualization Part 4

No problem scores in this section

[Week 8 Quiz](#) (6/6) 100%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

[Week 8 Assignment: Pandas practice](#) (100/100) 100%

Project due Apr 23, 2018 05:00 IST

Problem Scores: 100/100

[Week 8 Optional Problem: Data Visualisation\(Not Graded\)](#)

due May 1, 2018 05:00 IST

No problem scores in this section

[Week 8 Discussion Questions](#)

No problem scores in this section

## Week 9: Text Mining

[9.1 Text Mining Setup](#)

No problem scores in this section

[9.2 Sentiment Analysis Part 1](#)

No problem scores in this section

[9.3 Sentiment Analysis Part 2](#)

No problem scores in this section

[9.4 Sentiment Analysis Part 3](#)

No problem scores in this section

[9.5 Word Cloud](#)

No problem scores in this section

[9.6 Text Analysis-Complexity analysis Part 1](#)

No problem scores in this section

[9.7 Text analysis-Complexity analysis Part 2](#)

No problem scores in this section

[9.8 Text analysis-Dispersion Plots](#)

No problem scores in this section

[9.9 Text analysis-Sentiment analysis Part 5](#)

No problem scores in this section

[9.10 Named entity analysis](#)

No problem scores in this section

[9.11 Text summarization Part 1](#)

No problem scores in this section

[9.12 Text summarization Part 2](#)

No problem scores in this section

[9.13 Topic modeling Part 1](#)

No problem scores in this section

[9.14 Topic modeling Part 2](#)

No problem scores in this section

[9.15 Topic modeling Part 3](#)

No problem scores in this section

[Week 9 Assignment \(Text Mining wikipedia\)](#) (100/100) 100%

Project due Apr 23, 2018 05:00 IST

Problem Scores: 100/100

[Week 9 Quiz](#) (4/5) 80%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 0/1

[Week 9 Discussion Questions](#)

No problem scores in this section

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## Week 10: Analysis Of Networks

[Files for Week 10](#)

No problem scores in this section

[10.1 Introduction to Network Analysis with Python](#)

No problem scores in this section

[10.2 Construct a Simple Network](#)

No problem scores in this section

[10.3 Querying a Simple Network](#)

No problem scores in this section

[10.4 Networks with Weighted Edges \(Part 1\)](#)

No problem scores in this section

No problem scores in this section

### 10.5 Networks with Weighted Edges (Part 2)

No problem scores in this section

### 10.6 Graph Drawing Options (Part 1)

No problem scores in this section

### 10.7 Graph Drawing Options (Part 2)

No problem scores in this section

### 10.8 Yelp User Network Setup

No problem scores in this section

### 10.9 Querying the Yelp Graph

No problem scores in this section

### 10.10 Network Analysis Algorithms (Part 1)

No problem scores in this section

### 10.11 Network Analysis Algorithms (Part 2)

No problem scores in this section

### 10.12 Network Analysis Algorithms (Part 3)

No problem scores in this section

### Week 10 Quiz (2/4) 50%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 0/1 0/1

### Week 10 Assignment (Network) (100/100) 100%

Project due Apr 23, 2018 05:00 IST

Problem Scores: 100/100

### Week 10 Discussion Questions

No problem scores in this section

---

Week 11: Machine Learning  
with Python I

Files for Week 11

No problem scores in this section

11.1 Machine Learning - Rocks and Mines Dataset

No problem scores in this section

11.2 Machine Learning - Understanding the Data

No problem scores in this section

11.3 Machine Learning - Wines Dataset

No problem scores in this section

11.4 Setting Up the Regression

No problem scores in this section

11.5 Classification Metrics (Part 1)

No problem scores in this section

11.6 Classification Metrics (Part 2)

No problem scores in this section

11.7 Classification - Rocks and Mines Dataset

No problem scores in this section

11.8 Classification - Rocks and Mines Dataset (ROC Curve)

No problem scores in this section

Week 11 Quiz (7/7) 100%

Quiz due Apr 23, 2018 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

Week 11 Assignment (Machine Learning) (100/100) 100%

Project due Apr 23, 2018 05:00 IST

Problem Scores: 100/100

Week 11 Discussion Questions

No problem scores in this section

---

Week 12: Machine Learning  
with Python II

[Files for Week 12](#)

No problem scores in this section

[12.1 Understanding decision trees](#)

No problem scores in this section

[12.2 Regression trees Wines Dataset](#)

No problem scores in this section

[12.3 Regression trees Cross validation](#)

No problem scores in this section

[12.4 Classification trees Rocks and Mines dataset](#)

No problem scores in this section

[12.5 Clustering Image dataset](#)

No problem scores in this section

[12.6 K-Means clustering 1 Image dateset](#)

No problem scores in this section

[12.7 K-Means clustering 2 Image dataset](#)

No problem scores in this section

[12.8 K-Means clustering 3 Evaluating the model](#)

No problem scores in this section

[Week 12 Discussion Questions](#)

No problem scores in this section

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Post-Course survey

[Post-Course Survey](#)

No problem scores in this section

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Final Exam

[Final Exam](#) (100/100) 100%

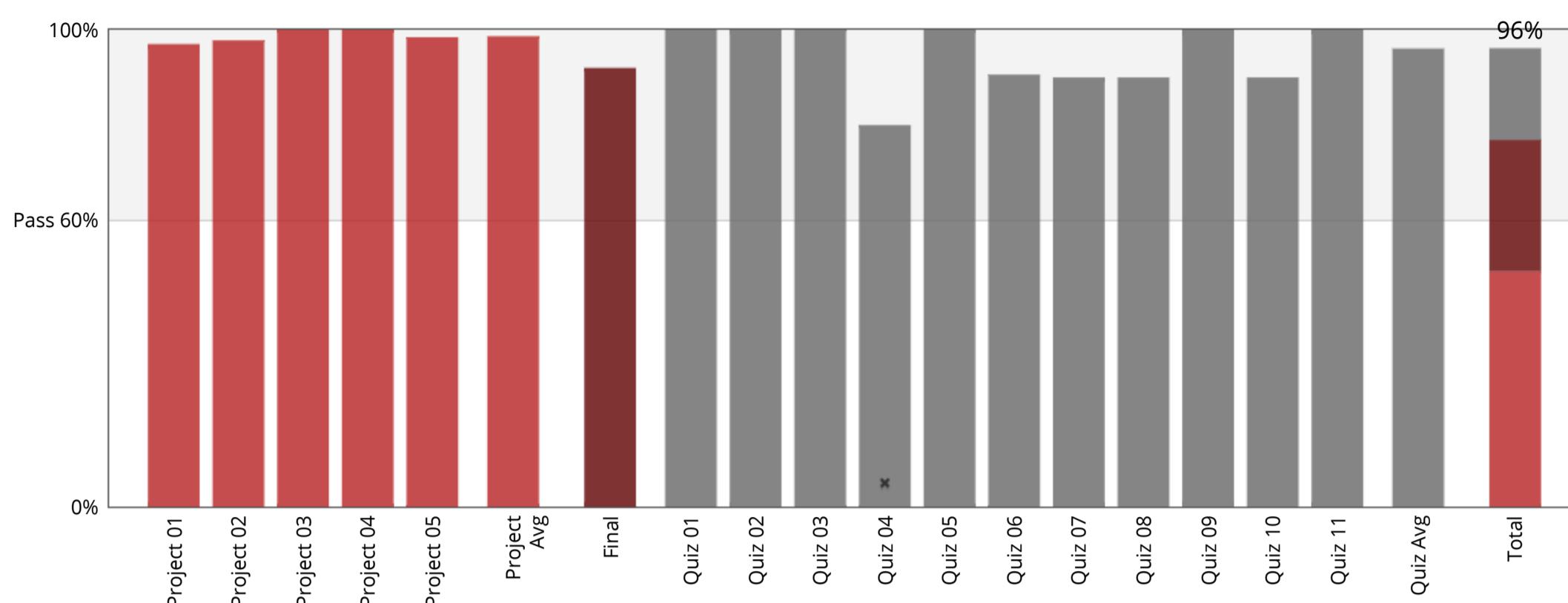
Final Exam due May 2, 2018 05:00 IST

Problem scores are hidden.

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Artificial Intelligence Course: Getting Started

#### Course Outline

No problem scores in this section

#### Course Information and Support

No problem scores in this section

#### Pre-Course Survey

No problem scores in this section

### Week 1: Introduction to AI

#### Week 1: Suggested Readings

No problem scores in this section

#### 1.1 Overview of AI

No problem scores in this section

#### 1.2 Applications of AI

No problem scores in this section

#### 1.3 AI Foundation and History

No problem scores in this section

#### 1.4 Course Overview

No problem scores in this section

#### Week 1 Quiz: Introduction to AI (100/100) 100%

Quiz due Apr 11, 2017 05:00 IST

Problem Scores: 100/100

#### Week 1 Discussion Questions

No problem scores in this section

### Week 2: Intelligent Agents and Uninformed Search

**2.1 Intelligent Agents**

No problem scores in this section

**2.2 Search Agents**

No problem scores in this section

**2.3 Uninformed Search**

No problem scores in this section

**2.4 Uninformed Search Examples**

No problem scores in this section

**Week 2 Quiz: Uninformed Search** (100/100) 100%*Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 10/10    10/10    10/10    10/10    10/10    10/10    10/10  
10/10    20/20**Week 2 Project: Search Algorithms** (194/200) 97%*Project due Apr 11, 2017 05:00 IST*

Problem Scores: 194/200

**Week 2 Discussion Questions**

No problem scores in this section

---

**Week 3: Heuristic Search****3.1 Heuristics and Greedy Search Algorithm**

No problem scores in this section

**3.2 A\* Search and Optimality**

No problem scores in this section

**3.3 Search Algorithms Recap**

No problem scores in this section

**3.4 Local Search**

No problem scores in this section

**Week 3 Quiz: Heuristic Search** (100/100) 100%*Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 10/10    10/10    10/10    10/10    10/10    10/10    10/10  
10/10    10/10    10/10**Week 3 Discussion Questions**

No problem scores in this section

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**Week 4: Adversarial Search and Games****Week 4 Suggested Readings**

No problem scores in this section

**4.1 Adversarial Search and Games**

No problem scores in this section

**4.2 Minimax algorithm**

No problem scores in this section

**4.3 Alpha-Beta Pruning**

No problem scores in this section

**4.4 Stochastic games**

No problem scores in this section

**Week 4 Quiz: Adversarial Search and Games** (80/100) 80%*Quiz due Apr 10, 2017 05:30 IST*Problem Scores: 10/10    10/10    0/10    10/10    10/10    10/10    10/10  
10/10    0/10    10/10**Week 4 Project: Adversarial Search and Games** (196/200) 98%*Project due Apr 11, 2017 05:00 IST*

Problem Scores: 196/200

**Week 4 Discussion Questions**

No problem scores in this section

**Week 5: Machine Learning 1****Week 5: Suggested Readings**

No problem scores in this section

**5.1 Machine Learning Concepts**

No problem scores in this section

**5.2 K-nearest Neighbors and Training-Testing**

No problem scores in this section

**5.3 Overfitting-Underfitting and Regularization**

No problem scores in this section

**5.4 Linear Models for Regression**

No problem scores in this section

**Week 5 Quiz: Machine Learning (100/100) 100%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 10/10 10/10 10/10 10/10 10/10 10/10 10/10 10/10  
10/10 10/10 10/10**Week 5 Discussion Questions**

No problem scores in this section

**Week 6: Machine Learning 2****Week 6: Suggested Readings**

No problem scores in this section

**6.1 Machine Learning: Perceptron**

No problem scores in this section

**6.2 Logistic Regression**

No problem scores in this section

**6.3 Decision Trees**

No problem scores in this section

**6.4 Naive Bayes**

No problem scores in this section

**6.5 Ensemble Methods**

No problem scores in this section

**Week 6 Quiz: Machine Learning 2 (96.3/106) 91%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 16.3/16.3 10/10 10/10 10/10 10/10 10/10 10/10 0/10  
10/10 10/10 10/10**Week 6 Discussion Questions**

No problem scores in this section

**Week 7: Machine Learning 3**

**Week 7: Suggested Readings**

No problem scores in this section

**7.1 Neural Networks**

No problem scores in this section

**7.2 Clustering**

No problem scores in this section

**7.3 Association Rules**

No problem scores in this section

**Week 7 Quiz: Machine Learning 3 (90/100) 90%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 10/10    10/10    10/10    10/10    10/10    10/10  
0/10    10/10    10/10**Week 7 Project: Machine Learning (200/200) 100%***Project due Apr 11, 2017 05:00 IST*

Problem Scores: 50/50    50/50    100/100

**Week 7 Discussion Questions**

No problem scores in this section

**Practice Proctored Exam (5/5) 100%***due Apr 10, 2017 05:00 IST*

Practice Scores: 5/5

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**Week 8: CSP****Week 8: Suggested Readings**

No problem scores in this section

**8.1 Constraint Satisfaction Problems**

No problem scores in this section

**8.2 Cryptarithmetic Puzzle**

No problem scores in this section

**8.3 Backtracking**

No problem scores in this section

**8.4 Constraint Propagation**

No problem scores in this section

**8.5 Problem Structure**

No problem scores in this section

**Week 8 Quiz: CSP (90/100) 90%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 10/10    10/10    10/10    10/10    10/10    10/10  
0/10    10/10    10/10**Week 8 Discussion Questions**

No problem scores in this section

---

**Week 9:  
Reinforcement  
Learning**

**Week 9: Reinforcement Learning Introduction**

No problem scores in this section

**9.1 Reinforcement Learning Overview**

No problem scores in this section

**9.2 Markov Decision Process (MDP)**

No problem scores in this section

**9.3 MDP - Finding Optimal Policy**

No problem scores in this section

**9.4 Example of an MDP and Bellman Equations**

No problem scores in this section

**9.5 Value Function - Matrix Notation**

No problem scores in this section

**9.6 Finding Optimal Policy in MDPs - Iterative Methods**

No problem scores in this section

**9.7 Policy Iteration Method Example**

No problem scores in this section

**9.8 Value Iteration Method**

No problem scores in this section

**9.9 Reinforcement Learning - Algorithms**

No problem scores in this section

**Week 9 Quiz: Reinforcement Learning (100/100) 100%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 10/10 10/10 10/10 10/10 10/10 10/10 10/10  
10/10 10/10 10/10**Week 9 Project: Constraint Satisfaction Problems (200/200) 100%***Project due Apr 11, 2017 05:00 IST*

Problem Scores: 200/200

**Week 9 Optional Project: Reinforcement Learning (not graded)**

No problem scores in this section

**Week 9 Discussion Questions**

No problem scores in this section

---

**Week 10: Logical Agents**

**Week 10: Suggested Readings**

No problem scores in this section

**10.1 Knowledge-based Agents**

No problem scores in this section

**10.2 The Wumpus World**

No problem scores in this section

**10.3 Logical Agent**

No problem scores in this section

**10.4 Building Propositions**

No problem scores in this section

**10.5 Inference Rules**

No problem scores in this section

**10.6 Reduced Wumpus World**

No problem scores in this section

**10.7 Model Checking and Inference**

No problem scores in this section

**10.8 Theorem Proving and Proof by Resolution**

No problem scores in this section

**10.9 Conversion to CNF and Resolution Algorithm**

No problem scores in this section

**10.10 Forward and Backward Chaining**

No problem scores in this section

**10.11 Propositional Logic: summary**

No problem scores in this section

**10.12 First Order Logic**

No problem scores in this section

**Week 10 Quiz: Logical Agents (90/100) 90%**

Quiz due Apr 11, 2017 05:00 IST

Problem Scores: 10/10 10/10 10/10 10/10 10/10 10/10 10/10  
10/10 10/10 0/10**Week 10 Discussion Questions**

No problem scores in this section

---

**Week 11: AI  
Applications: NLP**

**Week 11: Suggested Readings**

No problem scores in this section

**11.1 AI Applications: NLP**

No problem scores in this section

**11.2 Text Classification**

No problem scores in this section

**11.3 Text Classification Example**

No problem scores in this section

**11.4 Language Models**

No problem scores in this section

**11.5 Example of Bigrams**

No problem scores in this section

**11.6 Progress in NLP**

No problem scores in this section

**Week 11 Quiz: NLP (100/100) 100%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 10/10 10/10 10/10 10/10 10/10 10/10 10/10  
10/10 10/10 10/10**Week 11 Project: NLP (197/200) 98%***Project due Apr 11, 2017 05:00 IST*

Problem Scores: 197/200

**Week 11 Discussion Questions**

No problem scores in this section

**Week 12: AI Applications And Course Review****Week 12: Suggested Readings**

No problem scores in this section

**12.1 Deep Learning: Background and History**

No problem scores in this section

**12.2 Deep Learning: Architecture and Application**

No problem scores in this section

**12.3 Introduction to Robotics**

No problem scores in this section

**12.4 Robot Path Planning - Visibility Graphs**

No problem scores in this section

**12.5 Voronoi Graphs and Potential Fields**

No problem scores in this section

**12.6 Probabilistic Roadmap Planner (PRM)**

No problem scores in this section

**12.7 Rapidly-Exploring Random Trees (RRT) and Path Planning Summary**

No problem scores in this section

**12.8 Course Review and Conclusion**

No problem scores in this section

**Week 12 Discussion Questions**

No problem scores in this section

**Final Exam Setup****Final Exam (92/100) 92%***Final Exam due Apr 18, 2017 05:00 IST*Problem Scores: 4/4 4/4 4/4 4/4 4/4 0/4 4/4 0/4 4/4 4/4 4/4  
4/4 4/4 4/4 4/4 4/4



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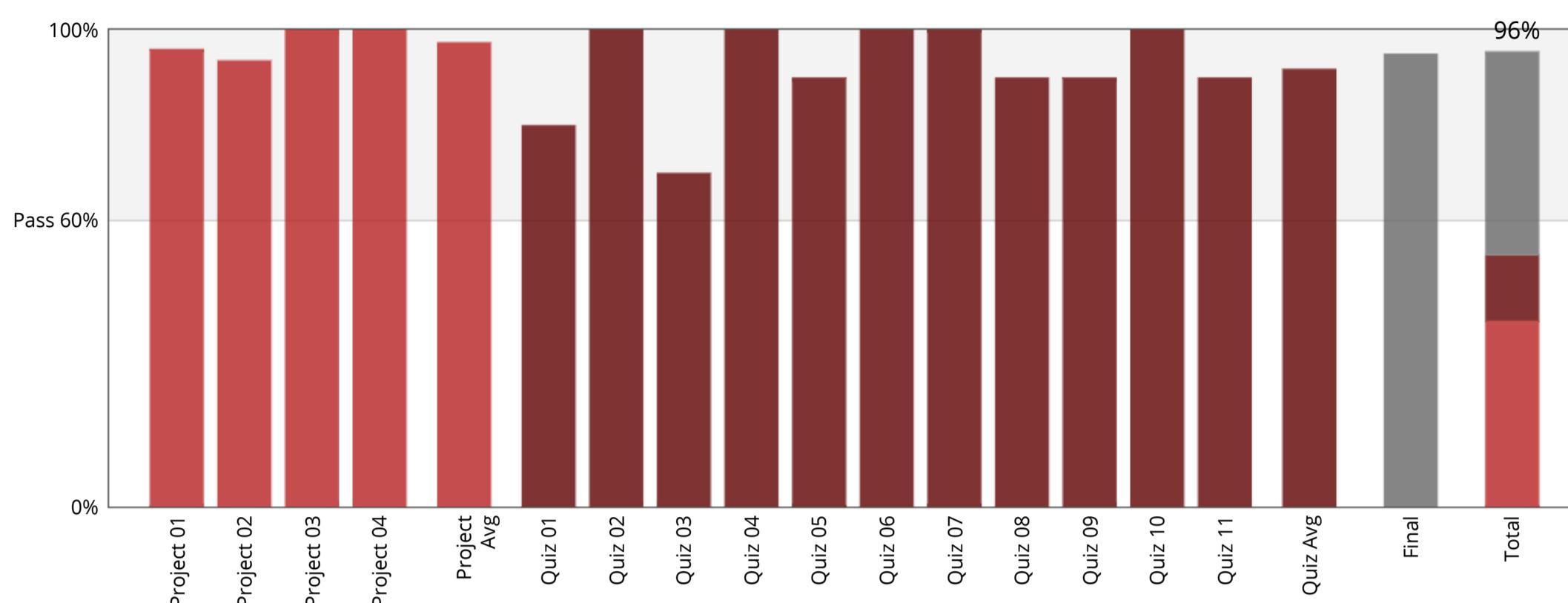




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Machine Learning Course: Getting Started

#### Course Outline

No problem scores in this section

#### Course Information and Support

No problem scores in this section

#### Recommended Readings

No problem scores in this section

#### Pre-Course Survey

No problem scores in this section

### Week 1

#### Lecture 1 Course Overview and Maximum Likelihood

No problem scores in this section

#### Lecture 2 Linear Regression and Least Squares

No problem scores in this section

#### Week 1 Quiz (8/10) 80%

Quiz due Apr 11, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/2

#### Week 1 Discussion Questions

No problem scores in this section

### Week 2

#### Lecture 3 Least Squares Regression (cont'd), Ridge Regression

No problem scores in this section

#### Lecture 4 Bias-Variance, Bayes Rule and MAP Inference

No problem scores in this section

#### Week 2 Quiz (10/10) 100%

Quiz due Apr 11, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 2/2 2/2

#### Week 2 Discussion Questions

No problem scores in this section

### Week 3

## Lecture 5 Bayesian Linear Regression

No problem scores in this section

## Lecture 6 Sparse Linear Regression

No problem scores in this section

### Week 3 Quiz (7/10) 70%

Quiz due Apr 11, 2017 05:00 IST

Problem Scores: 1/1 0/1 2/2 1/1 0/1 0/1 1/1 1/1 1/1

### Week 3 Project: Linear Regression (24/25) 96%

Project due Apr 11, 2017 05:00 IST

Problem Scores: 24/25

### Week 3 Discussion Questions

No problem scores in this section

## Week 4

## Lecture 7 Nearest Neighbors and Bayes Classifiers

No problem scores in this section

## Lecture 8 Linear Classifiers and Perceptron

No problem scores in this section

### Week 4 Quiz (10/10) 100%

Quiz due Apr 11, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1

### Week 4 Discussion Question

No problem scores in this section

## Week 5

## Lecture 9 Logistic Regression and Laplace Approximation

No problem scores in this section

## Lecture 10 Kernel Methods and Gaussian Processes

No problem scores in this section

### Week 5 Quiz (9/10) 90%

Quiz due Apr 11, 2017 05:00 IST

Problem Scores: 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1

### Week 5 Discussion Questions

No problem scores in this section

## Week 6

## Lecture 11 Maximum Margin Classifiers and the SVM

No problem scores in this section

## Lecture 12 Decision Trees

No problem scores in this section

### Week 6 Quiz (10/10) 100%

Quiz due Apr 11, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2

### Week 6 Project: Classification (23.4/25) 94%

Project due Apr 11, 2017 05:00 IST

Problem Scores: 23.4/25

### Week 6 Discussion Questions

No problem scores in this section

## Week 7

**Lecture 13 Boosting**

No problem scores in this section

**Lecture 14 Clustering and K-means**

No problem scores in this section

**Week 7 Quiz (10/10) 100%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1**Week 7 Discussion Questions**

No problem scores in this section

**Practice Proctored Exam (4/5) 80%***due Apr 10, 2017 05:00 IST*

Practice Scores: 4/5

---

**Week 8****Lecture 15 The EM Algorithm for Maximum Likelihood, Missing Data**

No problem scores in this section

**Lecture 16 Mixture Models, Gaussian Mixtures**

No problem scores in this section

**Week 8 Quiz (9/10) 90%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 1/1 1/1 0/1 1/1 1/1 2/2 1/1 1/1 1/1  
1/1**Week 8 Discussion Questions**

No problem scores in this section

---

**Week 9****Lecture 17 Matrix Factorization, Collaborative Filtering for Recommendation**

No problem scores in this section

**Lecture 18 Topic Modeling, Non-negative Matrix Factorization**

No problem scores in this section

**Week 9 Quiz (9/10) 90%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1**Week 9 Project: Clustering (25/25) 100%***Project due Apr 11, 2017 05:00 IST*

Problem Scores: 25/25

**Week 9 Discussion Questions**

No problem scores in this section

---

**Week 10****Lecture 19 Principal Component Analysis**

No problem scores in this section

**Lecture 20 Markov Models, Ranking and Semi-supervised Classification Examples**

No problem scores in this section

**Week 10 Quiz (10/10) 100%***Quiz due Apr 11, 2017 05:00 IST*Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1**Week 10 Discussion Questions**

No problem scores in this section

---

**Week 11**

**Lecture 21 Hidden Markov Models**

No problem scores in this section

**Lecture 22 Continuous State-space Models**

No problem scores in this section

**Week 11 Quiz (9/10) 90%***Quiz due Apr 11, 2017 05:00 IST*

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1 4/4

**Week 11 Discussion Questions**

No problem scores in this section

**Week 12****Lecture 23 Association Analysis**

No problem scores in this section

**Lecture 24 Model Selection**

No problem scores in this section

**Week 12 Project: Matrix Factorization (25/25) 100%***Project due Apr 11, 2017 05:00 IST*

Problem Scores: 25/25

**Week 12 Discussion Questions**

No problem scores in this section

**Post-Course Survey****Post-Course Survey**

No problem scores in this section

**Final Exam****Final Exam (95/100) 95%***Final Exam due Apr 18, 2017 05:00 IST*Problem Scores: 2.5/2.5 2.5/2.5 3.5/3.5 4/4 2.5/2.5 2.5/2.5  
2.5/2.5 2.5/2.5 2.5/2.5 0/2.5 4/4 2.5/2.5 2.5/2.5 2.5/2.5  
2.5/2.5 2.5/2.5 2.5/2.5 2.5/2.5 2.5/2.5 4/4 2.5/2.5 4/4  
2.5/2.5 2.5/2.5 2.5/2.5 2.5/2.5 2.5/2.5 2.5/2.5 2.5/2.5 2.5/2.5  
2.5/2.5 4/4 4/4 2.5/2.5 0/2.5 2.5/2.5

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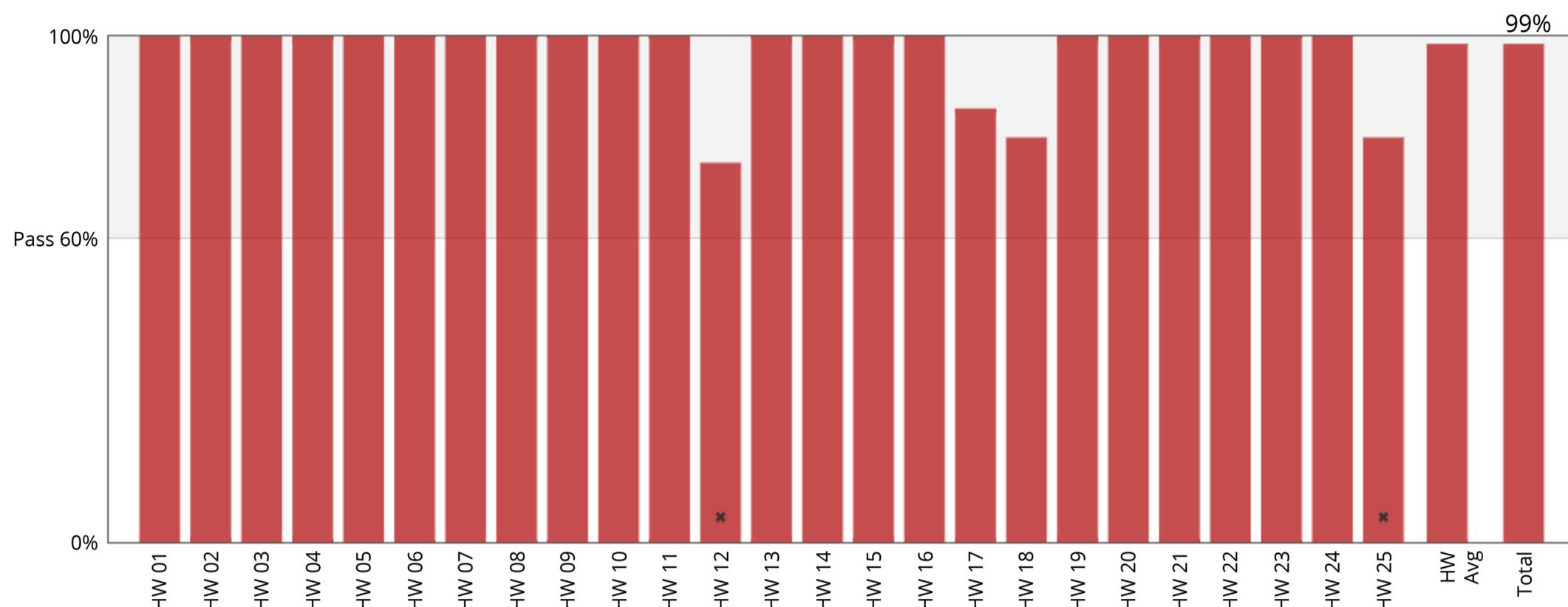




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Welcome!

#### Introduction to the course

No problem scores in this section

#### Pre-Assignment: Measuring success of an online course

No problem scores in this section

### Week 1: Introduction to Data Science

#### Introduction to Data Science

No problem scores in this section

##### 1a What is Data Science?

No problem scores in this section

##### 1b What questions can Data Science answer?

No problem scores in this section

##### 1c Why is there an explosion of data?

No problem scores in this section

##### 1d What role does data visualization play in Data Science?

No problem scores in this section

##### 1e How did you become interested in Data Science?

No problem scores in this section

##### 1f What do you predict will happen in Data Science in 5 years?

No problem scores in this section

##### 1g What are the most important skills for a Data Scientist?

No problem scores in this section

##### 1h What should a non-Data Scientist know about Data Science?

No problem scores in this section

##### 1i Assignment: A Very Short History of Data Science (4/4) 100%

Homework

Problem Scores: 4/4

##### 1j Assignment: What is Data Science? (7/7) 100%

Homework

Problem Scores: 7/7

### Week 2: Statistics and Probability I

**2a Statistical Thinking for Data Science (4/4) 100%**

Homework

Problem Scores: 4/4

**2b Numerical Data 1 Simple Visualization and Summaries (7/7) 100%**

Homework

Problem Scores: 2/2 5/5

**2c Numerical Data 2 Simple Visualization and Summaries**

No problem scores in this section

**2d Numerical Data 3 Association**

No problem scores in this section

**2e Data Collection - Sampling (2/2) 100%**

Homework

Problem Scores: 2/2

**2f Introduction to Probability (2/2) 100%**

Homework

Problem Scores: 2/2

**2g Statistical Inference - Confidence Intervals**

No problem scores in this section

**2h Statistical Inference - Significance tests**

No problem scores in this section

**2i Status of Current Observational Health Studies (3/3) 100%**

Homework

Problem Scores: 3/3

**2j Statistical Terms Explained**

No problem scores in this section

**2k Unknown Characteristics of Observational Health Studies (4/4)**

100%

Homework

Problem Scores: 4/4

**2l Lessons Learnt from OMOP Experiments**

No problem scores in this section

**2m P-value Calibration**

No problem scores in this section

**2n Concluding Remarks**

No problem scores in this section

**Week 2 Reading List**

No problem scores in this section

---

Week 3: Statistics  
and Probability II

**3a Conditional Probability**

No problem scores in this section

**3b Bayes' Formula (2/2) 100%**

Homework

Problem Scores: 2/2

**3c Studying Association: Two-way Table**

No problem scores in this section

**3d Studying Association: Chi-square Test of Independence**

No problem scores in this section

**3e Studying Association: One-way Analysis of Variance (6/6) 100%**

Homework

Problem Scores: 6/6

**3f Regression Analysis 1 and 2**

No problem scores in this section

**3g Regression Analysis 3 and 4**

No problem scores in this section

**3h Regression Analysis 4 and Concluding Remarks (3/3) 100%**

Homework

Problem Scores: 3/3

**3i Types of Data Analytics (3/4) 75%**

Homework

Problem Scores: 3/4

**3j Clustering Text (6/6) 100%**

Homework

Problem Scores: 6/6

**3k Topic Modeling**

No problem scores in this section

**3l Metrics for Label Description (8/8) 100%**

Homework

Problem Scores: 2/2 6/6

**3m Concluding Remarks (5/5) 100%**

Homework

Problem Scores: 5/5

---

Week 4:  
Exploratory Data  
Analysis and  
Visualization

**Week 4: Recommended Readings**

No problem scores in this section

**4a Graphs Are Comparisons**

No problem scores in this section

**4b Use Data To Answer Questions**

No problem scores in this section

**4c A Case Example**

No problem scores in this section

**4d Decision Making Process of Data Visualization 1**

No problem scores in this section

**4e Decision Making Process of Data Visualization 2 (3/3) 100%**

Homework

Problem Scores: 3/3

**4f Decision Making Process Main Worked Example**

No problem scores in this section

**4g Why Visualize Data Worked Example 1**

No problem scores in this section

**4h Why Visualize Data Worked Example 2 (6/7) 86%**

Homework

Problem Scores: 3/3 3/4

**4i Dashboards**

No problem scores in this section

**4j Dashboards Worked Example 1 (4/4) 100%**

Practice Scores: 4/4

**4k Dashboards Worked Example 2 (4/5) 80%**

Homework

Problem Scores: 4/5

---

Week 5:  
Introduction to  
Bayesian Modeling

## Week 5: Recommended Readings

No problem scores in this section

### 5a Introduction to Bayesian Modeling (5/5) 100%

Homework

Problem Scores: 5/5

### 5b Probability Calibration

No problem scores in this section

### 5c Probability As Measurement of Uncertainty

No problem scores in this section

### 5d Bayesian Inference (2/2) 100%

Homework

Problem Scores: 2/2

### 5e How To Use Prior Information (2/2) 100%

Homework

Problem Scores: 2/2

### 5f Bayesian Modeling in Practice (2/2) 100%

Homework

Problem Scores: 2/2

### 5g Business Applications in Bayesian Statistics Introduction

No problem scores in this section

### 5h Data Collection and Model Building 1

No problem scores in this section

### 5i Data Collection and Model Building 2

No problem scores in this section

### 5j Model Building Review (4/4) 100%

Homework

Problem Scores: 4/4

### 5k Model Insights 1

No problem scores in this section

### 5l Model Insights 2 (3/3) 100%

Homework

Problem Scores: 3/3

### 5m Example Modeling Museum Membership Renewal

No problem scores in this section

### 5n Example Modeling User Behavior on a Deals Website

No problem scores in this section

### 5 Extra Credit Assignment (4/5) 80%

Homework

Problem Scores: 4/5

## 5 Conclusion

No problem scores in this section

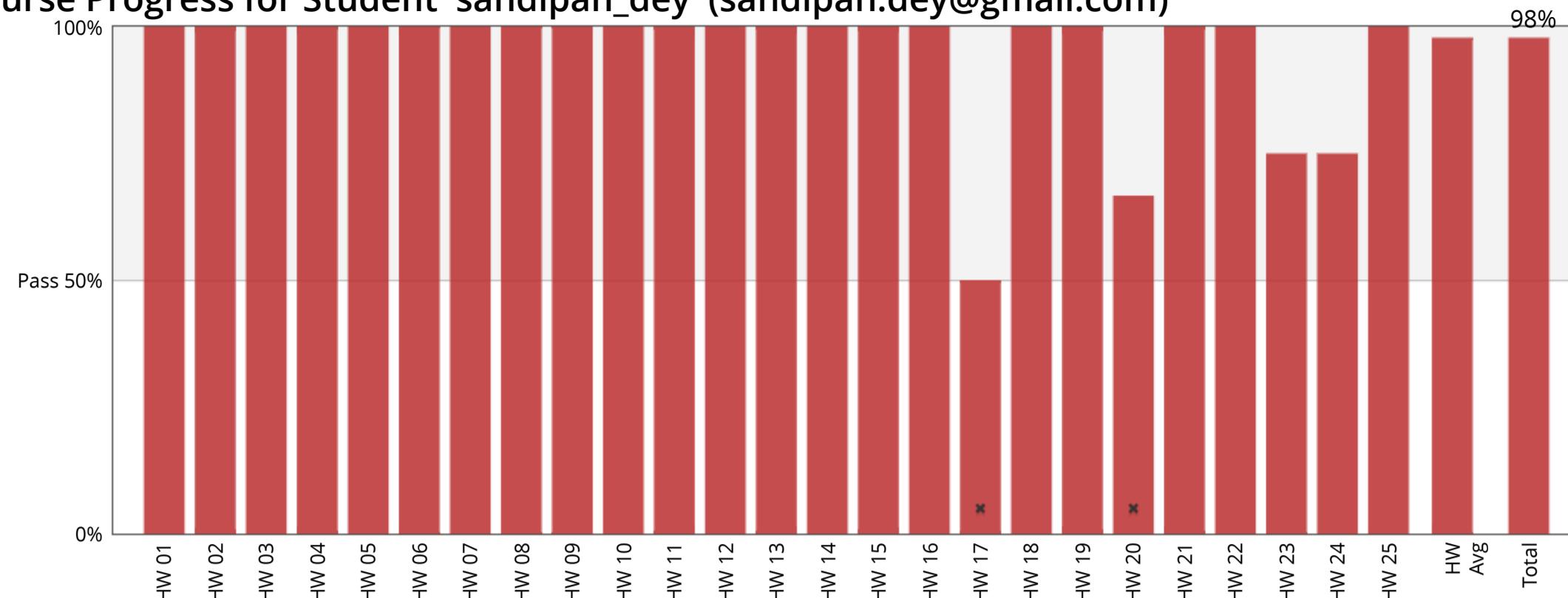


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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)



### Introduction to the course

#### Course Introduction

No problem scores in this section

#### Course Overview

No problem scores in this section

#### Course Outline

No problem scores in this section

#### Pre-Assignment: Introduce yourself

No problem scores in this section

### Week 1: Algorithms 1

#### 1a Introduction to Algorithms (2/2) 100%

Homework due Feb 11, 2016 05:00 IST

Problem Scores: 2/2

#### 1b Tools to Analyze Algorithms (2/2) 100%

Homework due Feb 11, 2016 05:00 IST

Problem Scores: 2/2

#### 1c Algorithmic Technique: Divide and Conquer

No problem scores in this section

#### 1d Divide and Conquer Example: Investing (2/2) 100%

Homework due Feb 11, 2016 05:00 IST

Problem Scores: 2/2

#### 1e Randomization in Algorithms (3/3) 100%

Homework due Feb 11, 2016 05:00 IST

Problem Scores: 3/3

#### 1f Application Area Scheduling 1

No problem scores in this section

#### 1g Application Area Scheduling 2 (0/3)

Practice Scores: 0/3

#### Algorithms 1: Suggested Readings

No problem scores in this section

### Week 2: Algorithms 2

**2a Graphs (3/3) 100%***Homework due Feb 11, 2016 05:00 IST*

Problem Scores: 3/3

**2b Some Ideas Behind Map Searches 1**

No problem scores in this section

**2c Some Ideas Behind Map Searches 2 (2/2) 100%***Homework due Feb 11, 2016 05:00 IST*

Problem Scores: 2/2

**2d Application of Algorithms: Stable Marriages Example (3/3) 100%***Homework due Feb 11, 2016 05:00 IST*

Problem Scores: 3/3

**2e Dictionaries and Hashing (3/3) 100%***Homework due Feb 11, 2016 05:00 IST*

Problem Scores: 3/3

**2f Search Trees (4/4) 100%***Homework due Feb 11, 2016 05:00 IST*

Problem Scores: 4/4

**2g Dynamic Programming 1**

No problem scores in this section

**2h Dynamic Programming 2 (2/2) 100%***Homework due Feb 11, 2016 05:00 IST*

Problem Scores: 2/2

**Algorithms 2: Suggested Readings**

No problem scores in this section

---

**Week 3: Algorithms****3**

**3a Linear Programming 1**

No problem scores in this section

**3b Linear Programming 2 (2/2) 100%**

Homework due Feb 18, 2016 05:00 IST

Problem Scores: 2/2

**3c NP-completeness 1**

No problem scores in this section

**3d NP-completeness 2**

No problem scores in this section

**3e NP-completeness 3 and Summary (7/7) 100%**

Homework due Feb 18, 2016 05:00 IST

Problem Scores: 7/7

**3f Introduction to Personal Genomics (1/1) 100%**

Homework due Feb 18, 2016 05:00 IST

Problem Scores: 1/1

**3g Massive Raw Data In Genomics (5/5) 100%**

Homework due Feb 18, 2016 05:00 IST

Problem Scores: 5/5

**3h Data Science On Personal Genomes (2/2) 100%**

Homework due Feb 18, 2016 05:00 IST

Problem Scores: 2/2

**3i Interconnectedness Of Personal Genomes (4/4) 100%**

Homework due Feb 18, 2016 05:00 IST

Problem Scores: 4/4

**3j Personal Genomics Case Studies (1/2) 50%**

Homework due Feb 18, 2016 05:00 IST

Problem Scores: 1/2

**3k Personal Genomics Conclusion**

No problem scores in this section

---

**Week 4: Machine Learning 1****4a What Is Machine Learning 1**

No problem scores in this section

**4b What Is Machine Learning 2**

No problem scores in this section

**4c Classification (2/2) 100%**

Homework due Feb 25, 2016 05:00 IST

Problem Scores: 2/2

**4d Linear Classifiers (2/2) 100%**

Homework due Feb 25, 2016 05:00 IST

Problem Scores: 2/2

**4e Ensemble Classifiers (0/3)**

due Feb 25, 2016 05:00 IST

Practice Scores: 0/3

**4f Model Selection**

No problem scores in this section

**4g Cross Validation (2/3) 67%**

Homework due Feb 25, 2016 05:00 IST

Problem Scores: 2/3

**4h Machine Learning Summary**

No problem scores in this section

**Machine Learning: Suggested Readings**

No problem scores in this section

## Week 5: Machine Learning 2 - Applications

### 5a Machine Learning Application: Probabilistic Modeling 1

No problem scores in this section

### 5b Probabilistic Modeling 2

No problem scores in this section

### 5c Topic Modeling

No problem scores in this section

### 5d Probabilistic Inference (4/4) 100%

Homework due Mar 3, 2016 05:00 IST

Problem Scores: 4/4

### 5e Machine Learning Application: Prediction of Preterm Birth

No problem scores in this section

### 5f Data Description and Preparation (2/2) 100%

Homework due Mar 3, 2016 05:00 IST

Problem Scores: 2/2

### 5g Methods for Prediction of Preterm Birth

No problem scores in this section

### 5h Results and Discussion

No problem scores in this section

### 5i Summary and Conclusion (3/4) 75%

Homework due Mar 3, 2016 05:00 IST

Problem Scores: 3/4

### 5j Relation Between Machine Learning and Statistics (3/4) 75%

Homework due Mar 3, 2016 05:00 IST

Problem Scores: 3/4

## Machine Learning Applications: Suggested Readings

No problem scores in this section

### Extra Credit Assignment (3/3) 100%

Homework due Mar 3, 2016 05:00 IST

Problem Scores: 3/3

## Conclusion

No problem scores in this section



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# HONOR CODE CERTIFICATE

This is to certify that

**Sandipan Dey**

successfully completed and received a passing grade in

**DS102X: Machine Learning for Data Science and  
Analytics**

a course of study offered by ColumbiaX, an online learning initiative of Columbia University through edX.

# ColumbiaX

**Kathy McKeown**

Director of the Data Science Institute  
Henry and Gertrude Rothschild Professor of Computer  
Science

*Columbia University*

**Patricia Culligan**

Associate Director of the Data Science Institute  
Professor of Civil Engineering

*Columbia University*

**Garud Iyengar**

Professor of Industrial Engineering and  
Operations Research, Chair of the Department

*Columbia University*



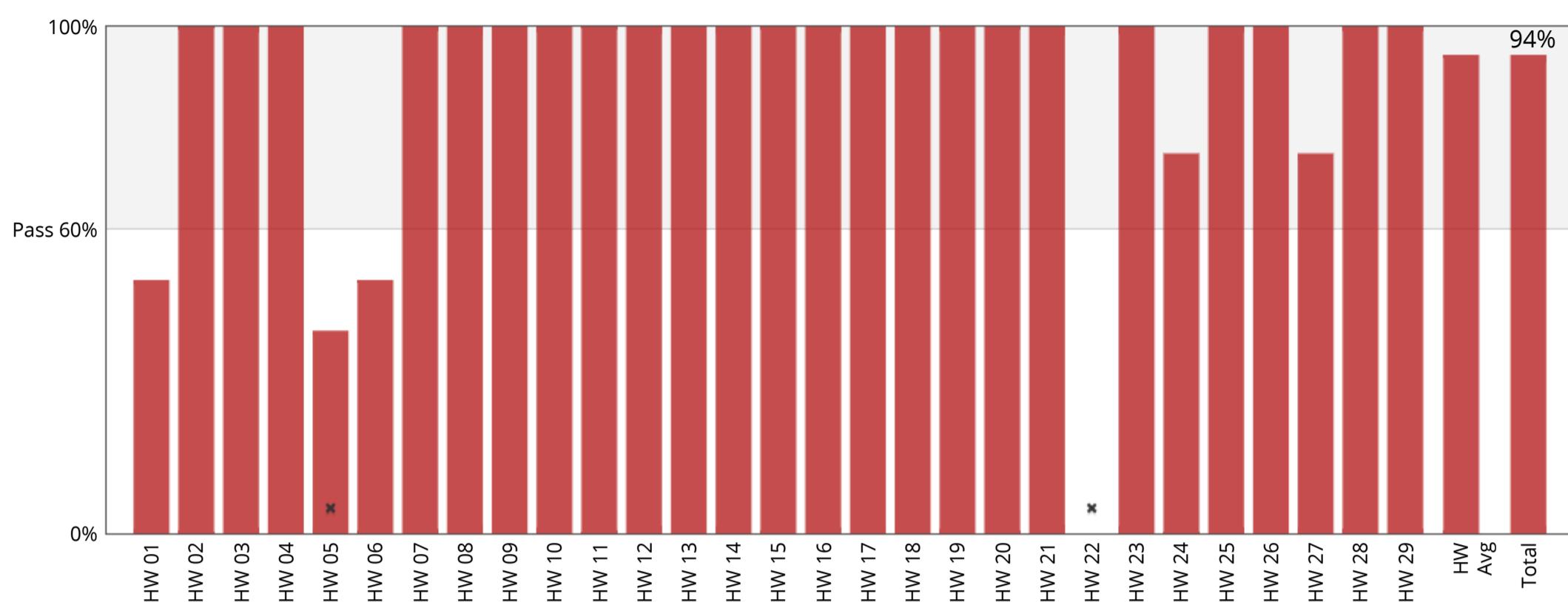
HONOR CODE CERTIFICATE  
Issued March 4, 2016

VALID CERTIFICATE ID  
600e8aa5d744321bfa634ee91285f8b

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Introduction to the course

#### Course Introduction

No problem scores in this section

#### Course Outline

No problem scores in this section

#### Pre-Assignment: Introduce yourself

No problem scores in this section

### Week 1: Internet of Things

#### 1a Internet of Things: Introduction 1

No problem scores in this section

#### 1b Internet of Things: Introduction 2 (2/4) 50%

Homework

Problem Scores: 2/2 0/2

#### Week 1: Readings

No problem scores in this section

#### 1c Wireless Communications 1

No problem scores in this section

#### 1d Wireless Communications 2: Cellular Mobile Systems

No problem scores in this section

#### 1e Wireless Communications 3: Comparison of Wireless Systems (3/3)

100%

Homework

Problem Scores: 3/3

#### 1f Wireless Standard: WiFi and Bluetooth 1

No problem scores in this section

#### 1g Wireless Standard: WiFi and Bluetooth 2 (4/4) 100%

Homework

Problem Scores: 4/4

#### 1h Wireless Standard: BLE and Zigbee 1

No problem scores in this section

#### 1i Wireless Standard: BLE and Zigbee 2 (4/4) 100%

Homework

Problem Scores: 4/4

### Week 2: Internet of

## Things

### Week 2: Readings

No problem scores in this section

#### 2a Networks for IoT 1

No problem scores in this section

#### 2b Networks for IoT 2 (2/5) 40%

Homework

Problem Scores: 2/5

#### 2c Securing IoT Networks 1

No problem scores in this section

#### 2d Securing IoT Networks 2 (1/2) 50%

Homework

Problem Scores: 1/2

#### 2e Networking: IoT - 6LoWPAN (3/3) 100%

Homework

Problem Scores: 1/1 2/2

#### 2f Networking: IoT - CoAP 1

No problem scores in this section

#### 2g Networking: IoT - CoAP 2 (3/3) 100%

Homework

Problem Scores: 3/3

#### 2h Networking: IoT - MQTT 1

No problem scores in this section

#### 2i Networking: IoT - MQTT 2 (3/3) 100%

Homework

Problem Scores: 3/3

---

## Week 3: Internet of Things

**3a Embedded Systems 1**

No problem scores in this section

**3b Embedded Systems 2 (4/4) 100%**

Homework

Problem Scores: 2/2 2/2

**3c Interfacing with the Physical World 1**

No problem scores in this section

**3d Interfacing with the Physical World 2 (4/4) 100%**

Homework

Problem Scores: 2/2 2/2

**3e Energy Harvesting 1**

No problem scores in this section

**3f Energy Harvesting 2**

No problem scores in this section

**3g Ultra Low Power Computing in VLSI (2/2) 100%**

Homework

Problem Scores: 2/2

**3h Hardware for Machine Learning (2/2) 100%**

Homework

Problem Scores: 2/2

**3i Cloud Robotics (3/3) 100%**

Homework

Problem Scores: 3/3

**3j IoT Economics 1**

No problem scores in this section

**3k IoT Economics 2**

No problem scores in this section

**3l IoT Economics 3 (4/4) 100%**

Homework

Problem Scores: 4/4

**Week 3: Suggested Readings**

No problem scores in this section

---

Week 4: Natural  
Language  
Processing

**4a At the Intersection of Language and Data Science**

No problem scores in this section

**4b NLP: News (2/2) 100%**

Homework

Problem Scores: 1/1 1/1

**4c NLP: Online Discussion Forums**

No problem scores in this section

**4d NLP: News and Online Discussion Forums (4/4) 100%**

Homework

Problem Scores: 4/4

**4e NLP: Personal Narrative (4/4) 100%**

Homework

Problem Scores: 3/3 1/1

**4f NLP: Novels (3/3) 100%**

Homework

Problem Scores: 1/1 2/2

**4g Application of Natural Language Processing**

No problem scores in this section

**4h Tagging Problems and Log-Linear Models 1**

No problem scores in this section

**4i Tagging Problems and Log-Linear Models 2**

No problem scores in this section

**4j Tagging Problems and Log-Linear Models 3 (3/3) 100%**

Homework

Problem Scores: 2/2 1/1

**4k Syntax and Parsing**

No problem scores in this section

**4l Dependency Parsing (2/2) 100%**

Homework

Problem Scores: 1/1 1/1

**4m Machine Translation 1**

No problem scores in this section

**4n Machine Translation 2 (0/1)**

Homework

Problem Scores: 0/1

---

Week 5: Audio,  
Video and Image  
Processing

**5a Speech and Data Science**

No problem scores in this section

**5b Speech Production and Perception (5/5) 100%**

Homework

Problem Scores: 2/2 3/3

**5c Recording Speech for Analysis**

No problem scores in this section

**5d Speech Features (3/4) 75%**

Homework

Problem Scores: 3/4

**5e Recognizing Emotional Speech (5/5) 100%**

Homework

Problem Scores: 5/5

**5f Detecting Deception from Speech and Text 1**

No problem scores in this section

**5g Detecting Deception from Speech and Text 2 and Conclusion (3/3)**

100%

Homework

Problem Scores: 3/3

**5h Multimedia in Large-Scale Data Applications (3/4) 75%**

Homework

Problem Scores: 3/4

**5i Visual Matching and Recognition Techniques 1**

No problem scores in this section

**5j Visual Matching and Recognition Techniques 2**

No problem scores in this section

**5k Visual Matching and Recognition Techniques 3 (2/2) 100%**

Homework

Problem Scores: 2/2

**5l Applications of Visual Recognition**

No problem scores in this section

**5m Research Topics and Conclusion (1/1) 100%**

Homework

Problem Scores: 1/1

**Week 5: Suggested Readings**

No problem scores in this section

**Week 5: Conclusion**

No problem scores in this section



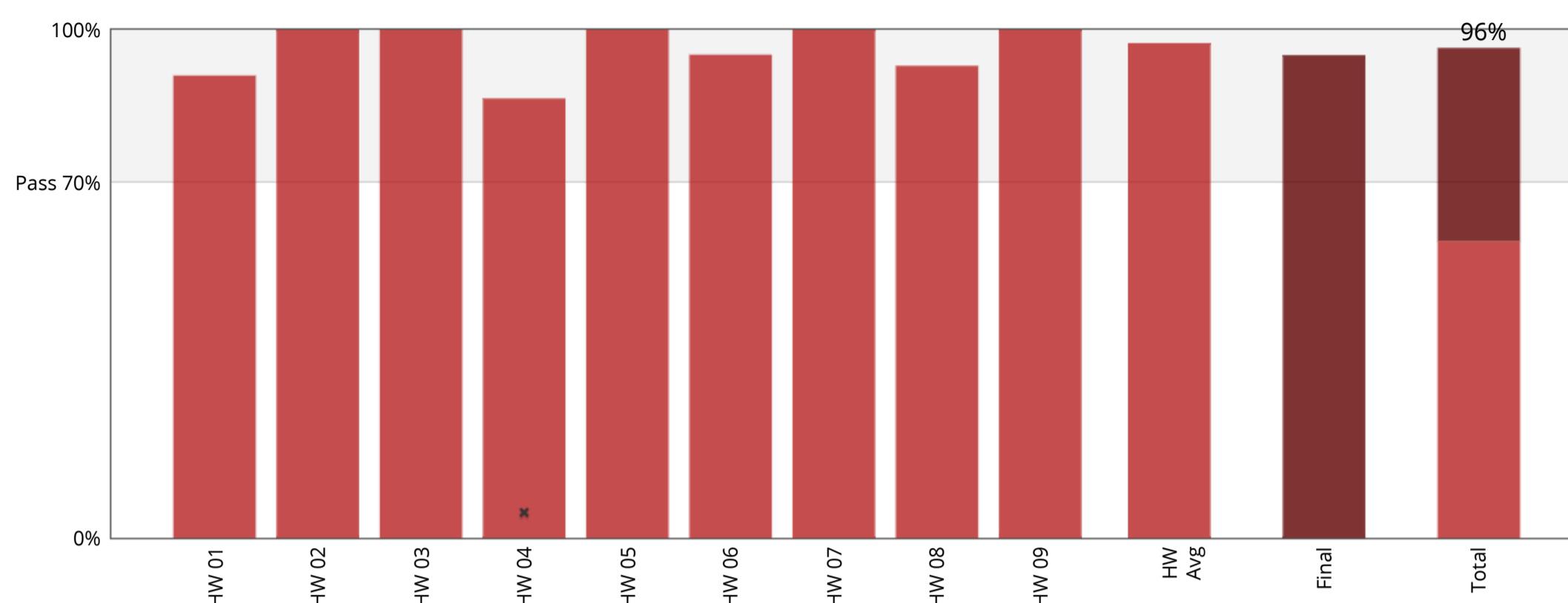
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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Module One: Exploring Graph Theory

#### Exploring Graph Theory (101/111) 91%

Homework due Mar 2, 2016 00:30 IST

| Problem Scores: | 1/1   | 1/1   | 1/1   | 1/1   | 1/1  | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   |
|-----------------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| 1/1             | 1/1   | 1/1   | 1/1   | 1/1   | 1/1  | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   |
| 1/1             | 1/1   | 1/1   | 1/1   | 1/1   | 1/1  | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   | 1/1   |
| 10/10           | 10/10 | 10/10 | 10/10 | 10/10 | 0/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 |

### Module Two: Game Theory and Auctions

#### Game Theory and Auctions (123/123) 100%

Homework due Mar 9, 2016 00:30 IST

| Problem Scores: | 1/1   | 1/1 | 2/2 | 4/4   | 1/1   | 1/1   | 2/2   | 3/3   | 3/3   |
|-----------------|-------|-----|-----|-------|-------|-------|-------|-------|-------|
| 3/3             | 10/10 | 1/1 | 1/1 | 10/10 | 10/10 | 30/30 | 10/10 | 30/30 | 30/30 |

### Module Three: Matching Markets

#### Introduction to Matching Markets (25/25) 100%

Homework due Mar 16, 2016 00:30 IST

| Problem Scores: | 4/4 | 1/1 | 2/2 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 3/3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1/1             | 6/6 | 1/1 | 2/2 |     |     |     |     |     |     |

#### Bargaining on Networks (71.8/83) 86%

Homework due Mar 23, 2016 00:30 IST

| Problem Scores: | 2/2   | 0/4   | 1/1   | 1/1   | 1/1   | 4/4   | 10/10 | 5/10 |
|-----------------|-------|-------|-------|-------|-------|-------|-------|------|
| 7.78/10         | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 |      |

### Module Four: Web Search

#### Web Search (38/38) 100%

Homework due Mar 30, 2016 00:30 IST

| Problem Scores: | 1/1 | 5/5   | 14/14 | 6/6 | 2/2 | 7/7 | 1/1 | 2/2 |
|-----------------|-----|-------|-------|-----|-----|-----|-----|-----|
| 1/1             | 5/5 | 14/14 | 6/6   | 2/2 | 7/7 | 1/1 | 2/2 |     |

#### Sponsored Search Markets (97/102) 95%

Homework due Apr 6, 2016 00:30 IST

| Problem Scores: | 9/9   | 3/3   | 8/8   | 3/3   | 5/5   | 4/4   | 10/10 | 10/10 |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 5/10            | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 |

### Module Five: Information Cascades

#### Information Cascades (22/22) 100%

Homework due Apr 13, 2016 00:30 IST

| Problem Scores: | 6/6 | 3/3 | 4/4 | 6/6 | 3/3 |
|-----------------|-----|-----|-----|-----|-----|
| 6/6             | 3/3 | 4/4 | 6/6 | 3/3 |     |

#### Popularity, Network Effects, and Informed Traders (87.3/94) 93%

Homework due Apr 20, 2016 00:30 IST

| Problem Scores: | 2/2 | 1/1     | 1/1   | 2/2   | 2/2   | 1/1   | 1/1   | 3/3   | 3/3   |
|-----------------|-----|---------|-------|-------|-------|-------|-------|-------|-------|
| 2/2             | 6/6 | 3.33/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 | 10/10 |

### Module Six: Social Contagion

**Social Contagion** (58/58) 100%

Homework due Apr 27, 2016 00:30 IST

Problem Scores: 3/3 2/2 1/1 1/1 1/1 40/40 10/10

**Final Exam** (38/40) 95%

Final Exam due May 4, 2016 00:30 IST

Problem Scores: 1.67/2 4/4 4/4 1/1 7.33/8 4/4 3/3 2/3  
5/5 3/3 3/3

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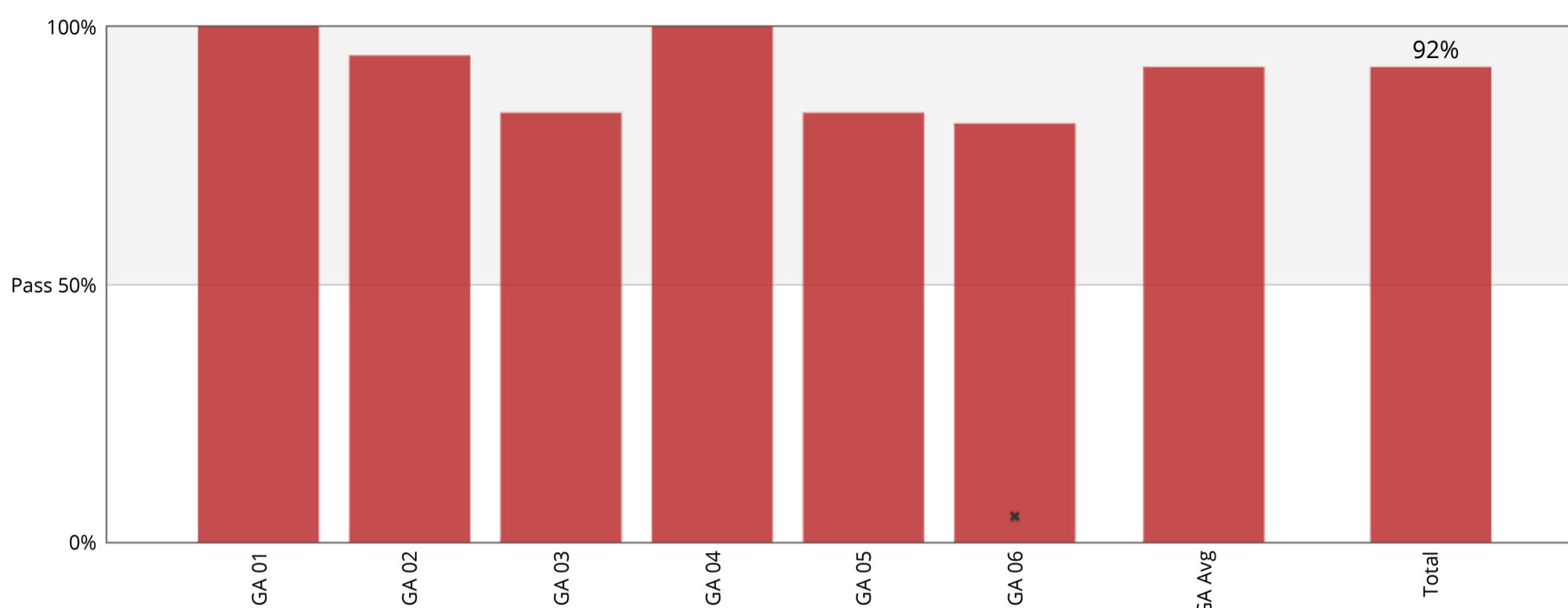




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### 0. Getting Started

#### Welcome to Observation Theory

No problem scores in this section

#### 0.1 Special modules in this course

No problem scores in this section

#### Forum

No problem scores in this section

#### Pre-Survey

No problem scores in this section

#### Feedback

No problem scores in this section

### 1. Introduction to Observation Theory

#### Warming up (0/9)

Practice Scores: 0/8 0/1

#### 1.1 What is the Problem? (9/9) 100%

Practice Scores: 1/1 8/8

#### 1.2 Quality and Types of Errors - part 1 (12/12) 100%

Practice Scores: 7/7 5/5

#### 1.2 Quality and Types of Errors - part 2 (14/14) 100%

Practice Scores: 1/1 1/1 1/1 2/2 7/7 1/1 1/1

#### 1.3 Elements of the Estimation Problem (10/10) 100%

Practice Scores: 1/1 1/1 1/1 1/1 1/1 1/1 3/3 1/1

#### Assessment (17/17) 100%

Graded Assignment due Feb 8, 2017 17:30 IST

Problem Scores: 1/1 1/1 2/2 2/2 3/3 1/1 3/3 1/1 3/3

#### Q&A Forum

No problem scores in this section

#### Feedback

No problem scores in this section

### 2. Mathematical model

## Warming Up

No problem scores in this section

### 2.1 Functional Model (27/27) 100%

Practice Scores: 3/3 4/4 2/2 4/4 2/2 3/3 1/1 2/2 3/3  
3/3

### 2.2 Properties of Functional Models (22/22) 100%

Practice Scores: 1/1 1/1 2/2 1/1 5/5 1/1 5/5 2/2 4/4

### 2.3 Stochastic Model (12/12) 100%

Practice Scores: 4/4 3/3 4/4 1/1

## Assessment (11.3/12) 94%

Graded Assignment *due Feb 8, 2017 17:30 IST*

Problem Scores: 4/4 3.33/4 2/2 2/2

## Q&A Forum

No problem scores in this section

## Feedback

No problem scores in this section

## 3. Least Squares Estimation (LSE)

### Warming up

No problem scores in this section

### 3.1 Least Squares Estimation (11/11) 100%

Practice Scores: 1/1 2/2 1/1 2/2 1/1 4/4

### 3.2 Weighted Least Squares Estimation (25/25) 100%

Practice Scores: 7/7 6/6 6/6 1/1 2/2 3/3

## Assessment (10/12) 83%

Graded Assignment *due Feb 8, 2017 17:30 IST*

Problem Scores: 0/2 4/4 2/2 4/4

## Q&A Forum

No problem scores in this section

### 3.© Geometry of Least Squares (optional topic) (5/5) 100%

Practice Scores: 1/1 1/1 2/2 1/1

## Mid-survey

No problem scores in this section

## Feedback

No problem scores in this section

## 4. Best Linear Unbiased Estimation (BLUE)

**Warming up**

No problem scores in this section

**4.1. Estimates vs Estimators (9/9) 100%**

Practice Scores: 1/1 1/1 1/1 4/4 2/2

**4.2. Best Linear Unbiased Estimation (BLUE) (5/5) 100%**

Practice Scores: 1/1 3/3 1/1

**Assessment (17/17) 100%**

Graded Assignment due Feb 8, 2017 17:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 2/2 4/4 1/1 2/2 4/4

**Q&A Forum**

No problem scores in this section

**4.© Non-linear Least Squares (optional topic) (7/8) 88%**

Practice Scores: 0/1 2/2 4/4 1/1

**Feedback**

No problem scores in this section

---

**5. How precise is the estimate?****Warming up**

No problem scores in this section

**5.1. Error Propagation (20/20) 100%**Practice Scores: 1/1 2/2 1/1 1/1 2/2 2/2 2/2 1/1  
1/1 1/1 1/1 1/1 1/1 1/1**5.2. Confidence Intervals (8/8) 100%**

Practice Scores: 1/1 1/1 4/4 1/1 1/1

**Assessment (15/18) 83%**

Graded Assignment due Feb 8, 2017 17:30 IST

Problem Scores: 1/1 1/1 0/3 1/1 2/2 1/1 2/2 1/1 6/6

**Q&A Forum**

No problem scores in this section

**Feedback**

No problem scores in this section

---

**6. Does the estimate make sense?****Warming up**

No problem scores in this section

**6.1. Overall Model Test (OMT) (20/20) 100%**

Practice Scores: 1/1 2/2 12/12 4/4 1/1

**6.2. OMT: Interpretation**

No problem scores in this section

**Assessment (13/16) 81%**

Graded Assignment due Feb 8, 2017 17:30 IST

Problem Scores: 2/2 1/3 1/1 1/1 1/1 0/1 2/2 2/2 1/1  
2/2**Q&A Forum**

No problem scores in this section

**Feedback**

No problem scores in this section

**Post-survey**

No problem scores in this section

---

**7. The End****Closure**

No problem scores in this section

**Pre-knowledge  
Mathematics**

- Pre.1. Statistics**  
No problem scores in this section
- Pre.2. Linear Algebra**  
No problem scores in this section
- Pre.3. Multivariate Calculus**  
No problem scores in this section
- Q&A Forum**  
No problem scores in this section

**MATLAB Learning  
Content**

- Mat.1. Getting Started in MATLAB (0/1)**  
Practice Scores: 0/1
- Mat.2. Creating Vectors and Matrices**  
No problem scores in this section
- Mat.3. Working with Data**  
No problem scores in this section
- Mat.4. Visualization**  
No problem scores in this section
- Mat.5. Program Control**  
No problem scores in this section
- Q&A Forum**  
No problem scores in this section



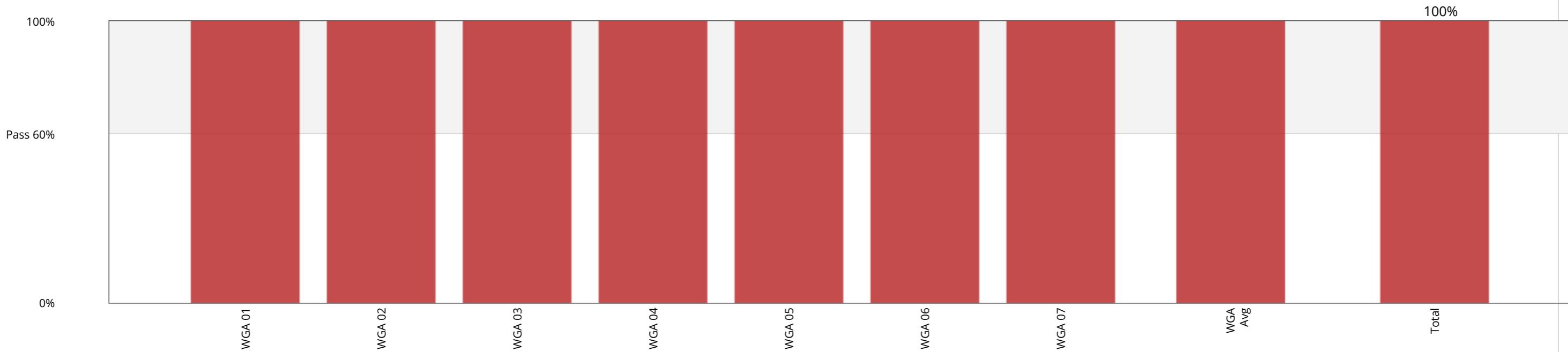
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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Preamble

#### Welcome

No problem scores in this section

#### What this course is about

No problem scores in this section

#### Practical Information

No problem scores in this section

### 1. Digital Images

### 1.1. Introduction

No problem scores in this section

### 1.2. Digital Images

No problem scores in this section

### 1.3. Digital Images in ImageJ

Practice Scores: 0/0 0/0 0/0 0/0

### 1.4. Image Display

Practice Scores: 0/0 0/0 0/0

### 1.5. Conclusion (10/10) 100%

Weekly Graded Assessment due Feb 4, 2019 05:30 IST

Problem Scores: 3/3 2/2 2/2 3/3

---

## 2. Of Colors & Dimensions

### 2.1. Introduction

No problem scores in this section

### 2.2. Seeing Colours

Practice Scores: 0/0

### 2.3. Image Bit-Depth & Channels

Practice Scores: 0/0 0/0 0/0 0/0

### 2.4. Beyond Channels

Practice Scores: 0/0 0/0 0/0

### 2.5. Conclusion (10/10) 100%

Weekly Graded Assessment due Feb 4, 2019 05:30 IST

Problem Scores: 4/4 4/4 2/2

---

## 3. Resizing, Interpolation and Mathematical Operations

### 3.1. Introduction

No problem scores in this section

### 3.2. Image Resizing

Practice Scores: 0/0 0/0

### 3.3. Mathematical Operations on Images

Practice Scores: 0/0 0/0 0/0

### 3.4. Conclusion (10/10) 100%

Weekly Graded Assessment due Feb 4, 2019 05:30 IST

Problem Scores: 4/4 2/2 2/2 2/2

---

## 4. Filtering

### 4.1. Introduction

No problem scores in this section

### 4.2. Image Filtering (3/3) 100%

Practice Scores: 1/1 1/1 1/1

### 4.3. Fourier Filtering

Practice Scores: 0/0 0/0

### 4.4. Conclusion (10/10) 100%

Weekly Graded Assessment due Feb 4, 2019 05:30 IST

Problem Scores: 3/3 4/4 3/3

---

## 5. Segmentation, From Intensities To Objects

## 5.1. Introduction

No problem scores in this section

## 5.2. Segmentation

Practice Scores: 0/0 0/0 0/0

## 5.3. Morphological Operations

Practice Scores: 0/0 0/0 0/0

## 5.4. Particle Analysis

Practice Scores: 0/0 0/0 0/0

## 5.5. Conclusion (10/10) 100%

Weekly Graded Assessment due Feb 4, 2019 05:30 IST

Problem Scores: 4/4 2/2 4/4

---

## 6. ROIs & Results

### 6.1. Introduction

No problem scores in this section

### 6.2. Regions of Interest (ROIs)

Practice Scores: 0/0 0/0 0/0

### 6.3. Results Tables

Practice Scores: 0/0

### 6.4. Folder Processing

Practice Scores: 0/0

### 6.5. Conclusion (10/10) 100%

Weekly Graded Assessment due Feb 4, 2019 05:30 IST

Problem Scores: 3/3 2/2 3/3 2/2

---

## 7. Color in Depth, Projections & Reslicing

## 7.1. Introduction

No problem scores in this section

## 7.2. Color & Color Models

Practice Scores: 0/0

## 7.3. Projections

Practice Scores: 0/0 0/0

## 7.4. Reslicing

No problem scores in this section

## 7.5. Conclusion (10/10) 100%

Weekly Graded Assessment due Feb 4, 2019 05:30 IST

Problem Scores: 4/4 2/2 2/2 2/2

---

## Extra. ImageJ Macro Language Programming Primer

### E.1. Introduction

No problem scores in this section

### E.2. Variables & Operators

Practice Scores: 0/0 0/0 0/0 0/0

### E.3. Arrays

Practice Scores: 0/0 0/0

### E.4. Conditionals

Practice Scores: 0/0 0/0

### E.5. Loops

Practice Scores: 0/0

### E.6. Macro Functions

Practice Scores: 0/0 0/0 0/0

### E.7. Conclusion

No problem scores in this section

---

## Goodbye note

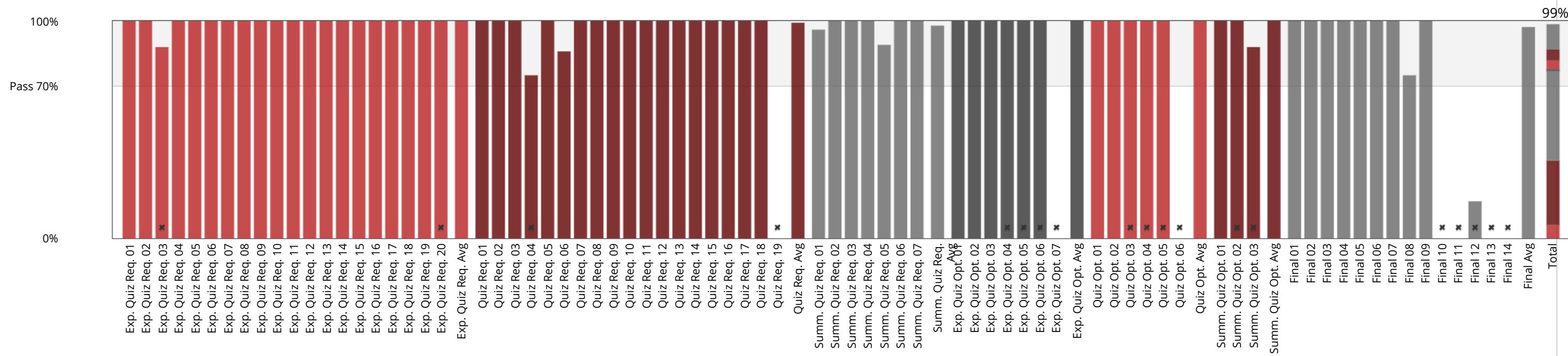
**Farewell**

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Section 0: Introduction and Course Orientation

### 1.1 Pre-Course Survey

No problem scores in this section

### 1.2 Welcome to the Course

No problem scores in this section

### 1.3 Goals, Prerequisites and Getting Started (7/7) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### 1.4 Grading, Assignments and Schedule

No problem scores in this section

### 1.5 Course Policies

No problem scores in this section

### 1.6 Introduce yourself!

No problem scores in this section

### 1.7 Course Community

No problem scores in this section

### 1.8 Help Forum for Section 0

No problem scores in this section

---

Section 1: What Makes a Good Test Question? Mathematical Models to Measure Knowledge and Improve Learning

[1.1 What Makes a Good Question? Introduction](#) (8/8) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[1.2 Modeling a Test Question](#) (3/3) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1

[1.3 Item Response Curves](#) (7/8) 88%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1

[1.4 The Item Response Model and its Parameters](#) (5/5) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1

[1.5 Creating and Using Item Response Curves](#)

No problem scores in this section

[1.6 A Dynamic Model for Improving Learning in Education](#)

No problem scores in this section

[1.7 Summary Quiz: How the Parameters of Item Response Model Relate to Difficulty, Discrimination and Guessing](#) (25/26) 96%

Summary Quiz (Required Sections)

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1

[1.8 Help Forum for Section 1](#)

No problem scores in this section

---

Section 2: Economic  
Applications of Calculus:  
Elasticity and A Tale of Two  
Cities

[1.1 A Tale of Two Cities: Public Transit Fares in New York and Boston](#) (3/3) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1

[1.2 Price and Demand](#) (9/9) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 4/4 2/2 1/1 1/1

[1.2 Price and Demand Part 2](#) (6/6) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 2/2 1/1

[1.3 Measuring What Matters: Price Elasticity of Demand](#) (9/9) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 3/3 1/1 1/1

[1.4 Price Elasticity of Demand: A Calculus Viewpoint](#) (4/4) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1

[1.4 Continued](#) (3/4) 75%

Quiz (Required Sections)

Problem Scores: 1/1 0/1 1/1 1/1

[1.5 A Tale of Two Cities, Revisited](#)

No problem scores in this section

[1.6 Elasticity and Maximizing Revenue](#) (3/3) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1

[1.6 Part 2](#) (3/3) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1

[1.7 Summary Quiz - A little more about math and economics from Kiran Gajwani](#) (8/8) 100%

Summary Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[1.8 Help Forum for Section 2](#)

No problem scores in this section

## Section 3: From X-rays to CT scans: Mathematics and Medical Imaging

### [1.1 Medical Imaging in a Real Patient's Case](#) (3/3) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1

### [1.2 What is an x-ray?](#) (2/2) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1

### [1.2.4 Quiz part 2](#) (6/7) 86%

Quiz (Required Sections)

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1 1/1

### [1.3 A Mathematical Model for an X-Ray](#) (2/2) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1

### [1.4 X-Rays through a Non-Uniform Material](#) (5/5) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 3/3

### [1.4.4 Exploratory Quiz](#) (4/4) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1

### [1.5 Finding the Attenuation Function from Many Views](#) (4/4) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 2/2 2/2

### [1.6 CT Scans: What They Can Reveal in a Real Patient's Case](#)

No problem scores in this section

### [1.7 Summary Quiz: From X-rays to CT-scans](#) (13/13) 100%

Summary Quiz (Required Sections)

Problem Scores: 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### [1.8 Additional Resources](#)

No problem scores in this section

### [1.9 Help Forum for Section 3](#)

No problem scores in this section

## Section 4: What is Middle

## Income? Thinking about Income Distributions with Statistics and Calculus

### [1.1 What is Middle Income? Looking at Income Distributions](#) (5/5) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1

### [1.2 Looking at Income Distributions: Frequency and Relative Frequency Histograms](#) (7/7) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### [1.3 What is Middle Income? Mean, Median and Beyond](#) (7/7) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### [1.4 From Histogram of Data to Continuous Model: Probability Density Functions](#) (7/7) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### [1.5 Using Integration to Estimate Households in Middle Income Range](#) (10/10) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 6/6 1/1 1/1 1/1 1/1

### [1.6 What is Middle Income? Mean and Median for the Continuous Model](#)

No problem scores in this section

### [1.7 Optional Video: A Little More from Nina about Statistics in her work](#)

No problem scores in this section

### [1.8 Summary Quiz](#) (14/14) 100%

Summary Quiz (Required Sections)

Problem Scores: 1/1 1/1 4/4 1/1 1/1 1/1 2/2 1/1 1/1 1/1

### [1.9 Help Forum for Section 4](#)

No problem scores in this section

## Section 5: Population Dynamics Part I: the Evolution of Population Models

[1.1 Introduction to Population Models](#) (7/7) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 2/2 1/1 1/1 1/1

[1.2 Limits on Growth: Verhulst's Model](#) (8/8) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[1.3 Species Interact: D'Ancona's Puzzle and Volterra's Predator-Prey Model](#) (8/8) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 5/5

[1.4 Volterra's Model in Action: Marlin and Sardines](#) (10/10) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 2/2 2/2 2/2 1/1 1/1

[1.5 How Populations Change in a Predator-Prey System](#) (5/5) 100%

Quiz (Required Sections)

Problem Scores: 4/4 1/1

[1.6 Summary Quiz: Population Models](#) (8/9) 89%

Summary Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 0/1 5/5

[1.7 Help Forum for Section 5-6](#)

No problem scores in this section

---

Section 6: Population Dynamics  
II: A Biological Puzzle OR How  
Fishing Affects a Predator-Prey  
System

## 2.1 Introduction to the Biological Puzzle

No problem scores in this section

## 2.2 The Average Value of Populations in a Predator-Prey System (2/2) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1

## 2.2.5 & 2.2.6 (1/1) 100%

Quiz (Required Sections)

Problem Scores: 1/1

## 2.3 The Effect of Fishing on the Predator-Prey System (9/9) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 2/2 2/2 2/2 1/1 1/1 1/1

## 2.4 D'Ancona's Puzzle Again and Implications for Fishing Regulations

No problem scores in this section

## 2.5 Making a Good Model: Issues and Limitations (Optional) (1/1) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1

## 2.6 Summary Quiz (16/16) 100%

Summary Quiz (Required Sections)

Problem Scores: 1/1 1/1 2/2 1/1 1/1 1/1 5/5 1/1 1/1 1/1 1/1

## 2.7 Help Forum for Section 6

No problem scores in this section

---

Section 7: Bifurcation Part I:  
Extinction, Chaos and other  
Bifurcation Behavior

[1.1 What is a Bifurcation? Introduction](#) (3/3) 100%

Exploratory Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1

[1.1 Continued](#) (7/7) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 5/5

[1.2 Modeling Fish Populations](#)

No problem scores in this section

[1.2 Continued](#) (5/5) 100%

Quiz (Required Sections)

Problem Scores: 2/2 1/1 1/1 1/1

[1.3 Survival or Extinction: The Effect of Harvesting on Fish Population](#) (18/18) 100%

Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 7/7 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[1.4 Summary Quiz: Bifurcations and Fishing](#) (18/18) 100%

Summary Quiz (Required Sections)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 7/7 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[1.5 Mathematics and Biology: A Symbiotic Relationship](#)

No problem scores in this section

[Help Forum for Section 7](#)

No problem scores in this section

---

Optional Sections (CHOOSE 1 of 3)

[Optional Sections](#)

No problem scores in this section

---

Section 8: Bifurcation Part II:  
Outbreak! Budworm  
Populations and Bifurcations  
(OPTIONAL)

[1.1 Introduction to the Budworm Model](#) (4/4) 100%

Exploratory Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1 1/1

[1.2 Modifying the Budworm Model to include Predation](#) (8/8) 100%

Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[1.3 Equilibrium Points and Carrying Capacity](#) (2/2) 100%

Exploratory Quiz (Optional Section)

Problem Scores: 1/1 1/1

[1.4 Increasing the Carrying Capacity Further](#) (6/6) 100%

Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

[1.5 Summary Quiz: Budworm Population Outbreaks](#) (14/14) 100%

Summary Quiz (Optional Section)

Problem Scores: 1/1 1/1 2/2 1/1 1/1 1/1 1/1 2/2 1/1 1/1 1/1 1/1 1/1

[1.6 Summary](#)

No problem scores in this section

[Help Forum for Section 8](#)

No problem scores in this section

Section 9: Bifurcation Part III:

Species in Competition:

Coexistence or Exclusion

(OPTIONAL)

[1.1 A Model of Species in Competition](#) (6/6) 100%

Exploratory Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

[1.2 How Weak Competition Affects the System](#) (4/4) 100%

Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1 1/1

[1.3 How Strong Competition Affects the System](#) (3/3) 100%

Exploratory Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1

[1.4 The Bifurcation Value and Competition in Economic Systems](#)

No problem scores in this section

[1.5 Summary Quiz: Species in Competition and Bifurcation Values](#) (14/14) 100%

Summary Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Help Forum for Section 9](#)

No problem scores in this section

---

Section 10: E = mc<sup>2</sup>; Taylor  
Approximation and the Energy  
Equation (OPTIONAL)

[1.1 Introducing the Energy-Mass Equation](#) (1/1) 100%

Exploratory Quiz (Optional Section)

Problem Scores: 1/1

[1.2 Taylor Approximation for the Energy-Mass Equation](#) (3/3) 100%

Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1

[1.3 Making Sense of the First Few Terms of the Approximation](#) (6/6) 100%

Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

[1.4 Higher Terms and Faster Speeds](#) (1/1) 100%

Exploratory Quiz (Optional Section)

Problem Scores: 1/1

[1.5 String Theory, the Energy Equation and a Physicist's Dream](#)

No problem scores in this section

[1.6 Summary Quiz: E = mc<sup>2</sup>: Taylor Approximation and the Energy Equation](#) (7/8) 88%

Summary Quiz (Optional Section)

Problem Scores: 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1

[1.7 Additional Resources](#)

No problem scores in this section

[1.8 Help Forum for Section 10](#)

No problem scores in this section

## Section 11: Final Assessment

[Video: In Closing... and final assessment](#)

No problem scores in this section

[Final Assessment Instructions and Part I](#) (1/1) 100%

Final Assessment

Problem Scores: 1/1

[Final Assessment Part II: Self-Review Practice and Instructions](#)

Practice Scores: 0/0

[Help Forum for Final Assessments](#)

No problem scores in this section

Final Assessment Part II; Option I: Physics: Pondering a Pendulum (CHOOSE ONE)

[Final Assessment Option 1: Physics Pondering a Pendulum](#) (3/3) 100%

Final Assessment

Problem Scores: 1/1 1/1 1/1

[2.0 Model of Pendulum Motion](#) (4/4) 100%

Final Assessment

Problem Scores: 1/1 1/1 1/1 1/1

[3.0 Qualitative Analysis of the Linearized Model](#) (14/14) 100%

Final Assessment

Problem Scores: 1/1 1/1 4/4 4/4 1/1 1/1 1/1 1/1

[4.0 Solving the Simplified Pendulum Model](#) (5/5) 100%

Final Assessment

Problem Scores: 1/1 1/1 1/1 1/1 1/1

[5.0 How does gravity or pendulum weight and length affect the period?](#) (4/4) 100%

Final Assessment

Problem Scores: 1/1 1/1 1/1 1/1

[6.0 Summary Quiz](#) (4/4) 100%

Final Assessment

Problem Scores: 1/1 1/1 1/1 1/1

[6.2 Summary Quiz Part II: Self Assessment](#) (3/4) 75%

Final Assessment

Problem Scores: 3/4

[6.3 Summary Quiz Part III: What Happens in the Original System for the Pendulum?](#) (1/1) 100%

Final Assessment

Problem Scores: 1/1

Final Assessment Part II; Option II: Climate (CHOOSE ONE)

## 1.0 Introduction and Intuition

No problem scores in this section

## 2.0 Modeling Temperature Change

No problem scores in this section

## 3.0 Exploratory Quiz (0/5)

Final Assessment

Problem Scores: 0/1 0/1 0/1 0/1 0/1

## 3.1 Quiz: Making Sense of the Model (0/3)

Final Assessment

Problem Scores: 0/1 0/1 0/1

## 4.0 What is the Effect of Albedo on Temperature in the Long Run? - 5.0 Making A More Realistic Model: The Temperature-Albedo Interaction (1/6) 17%

Final Assessment

Problem Scores: 0/1 1/1 0/1 0/1 0/1 0/1

## 6.0 Summary Quiz (0/7)

Final Assessment

Problem Scores: 0/1 0/1 0/1 0/1 0/1 0/1 0/1

## 6.2 Self-Assessment (0/4)

Final Assessment

Problem Scores: 0/4

---

## Section 12: Course Wrap Up

### End of Course Survey and Feedback Forum

No problem scores in this section

---

## Acknowledgements

### Acknowledgements and Special Thanks

No problem scores in this section

---

## Section

A CS50 Certificate

CS50 congratulates

# Sandipan Dey

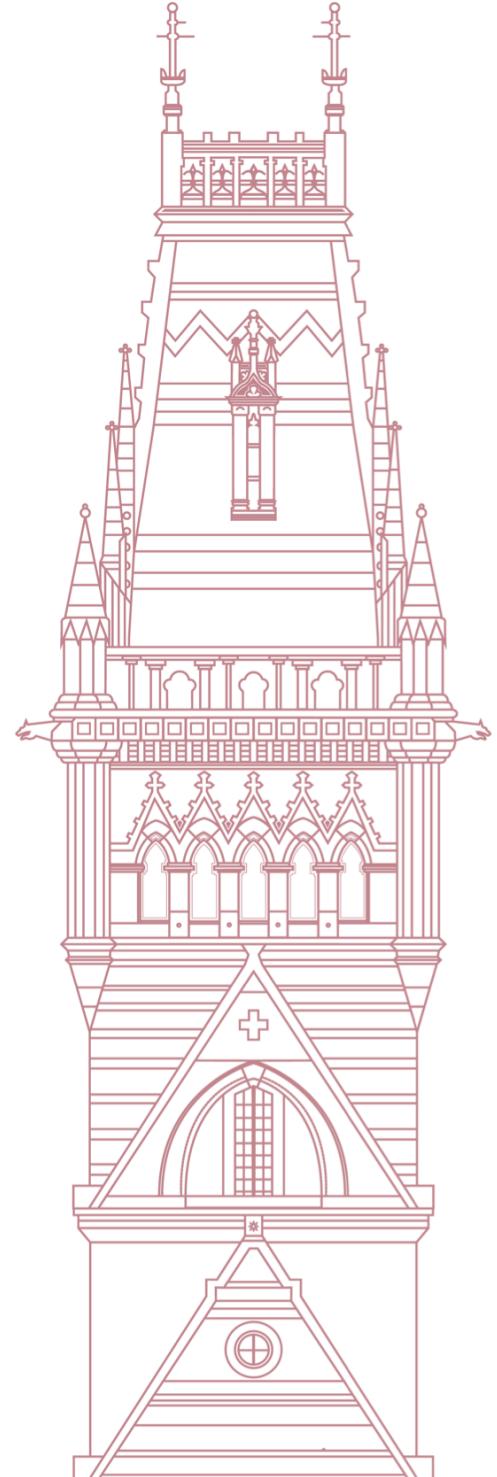
on completion of CS50's Introduction to Artificial Intelligence with Python  
online, including its twelve projects and seven quizzes.

Awarded from Cambridge, Massachusetts,  
in the year two thousand twenty.



**David J. Malan**

Gordon McKay Professor of the Practice of Computer Science  
Harvard University

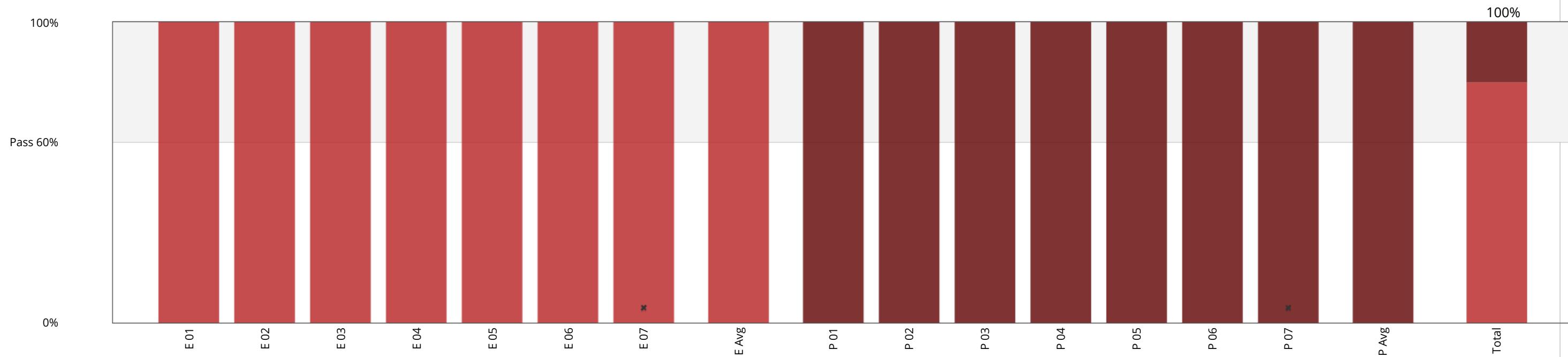


<https://cs50.harvard.edu/certificates/cdbc2b31-91e8-4c5e-984f-bd2837f4f425>

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Introduction

#### Introduction

No problem scores in this section

#### Pre-Course Survey

No problem scores in this section

#### Introduce Yourself

No problem scores in this section

### 1 Basic Counting

### Introduction

No problem scores in this section

### Lessons and Practice (12/12) 100%

Practice

Problem Scores: 1/1 1/1 0/0 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Evaluation 1 (8/8) 100%

Evaluation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## 2 Advanced Counting

### Introduction

No problem scores in this section

### Lessons and Practice (12/12) 100%

Practice

Problem Scores: 1/1 1/1 0/0 0/0 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Evaluation 2 (8/8) 100%

Evaluation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## 3 Basic Probability

### Introduction

No problem scores in this section

### Lessons and Practice (8/8) 100%

Practice

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/0 0/0

### Evaluation 3 (8/8) 100%

Evaluation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## 4 Expected Value

### Introduction

No problem scores in this section

### Lessons and Practice (8/8) 100%

Practice

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Evaluation 4 (8/8) 100%

Evaluation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## 5 Conditional Probability

### Introduction

No problem scores in this section

### Lessons and Practice (16/16) 100%

Practice

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Evaluation 5 (8/8) 100%

Evaluation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## 6 Bernoulli Trials

### Introduction

No problem scores in this section

### Lessons and Practice (3/3) 100%

Practice

Problem Scores: 1/1 1/1 1/1

### Evaluation 6 (8/8) 100%

Evaluation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## 7 The Normal Distribution

### Introduction

No problem scores in this section

### Lessons and Practice (9/9) 100%

Practice

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Evaluation 7 (8/8) 100%

Evaluation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Conclusion

### Conclusion

No problem scores in this section

### Post-Course Survey

No problem scores in this section

## Credits and Acknowledgments

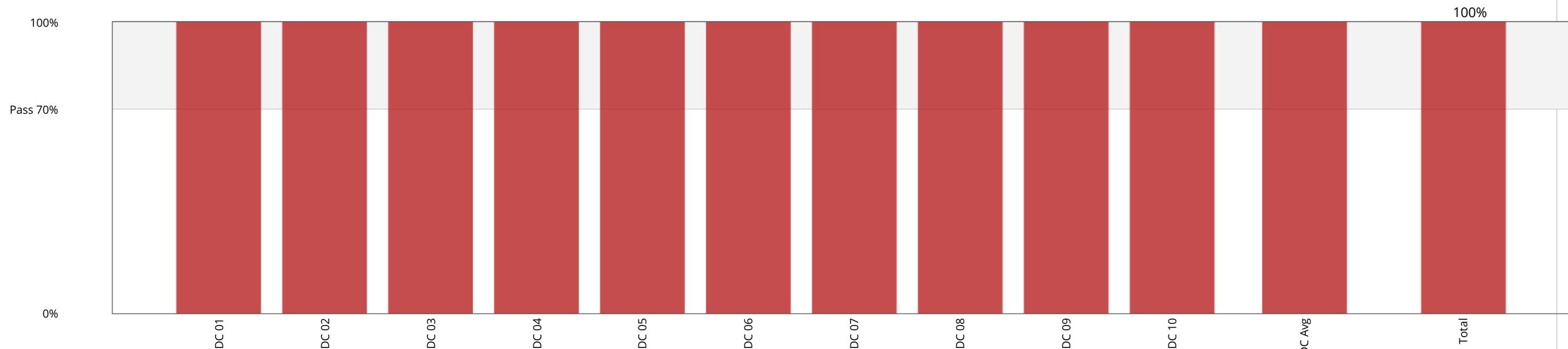
### Credits and Acknowledgments

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Introduction and Welcome

#### Introduction and Welcome

No problem scores in this section

#### 0.1 Important Pre-Course Survey.

No problem scores in this section

### Section 1: Introduction to Data Visualization and Distributions

## Section 1 Overview

No problem scores in this section

### 1.1 Introduction to Data Visualization (5/5) 100%

Assessment

Problem Scores: 5/5

### 1.2 Introduction to Distributions (13/13) 100%

Assessment

Problem Scores: 5.5/5.5 7.5/7.5

### 1.3 Quantiles, Percentiles, and Boxplots (4.5/4.5) 100%

Assessment

Problem Scores: 4.5/4.5

---

## Section 2: Introduction to ggplot2

## Section 2 Overview

No problem scores in this section

### 2.1 Basics of ggplot2 (7.5/7.5) 100%

Assessment

Problem Scores: 7.5/7.5

### 2.2 Customizing Plots (19/19) 100%

Assessment

Problem Scores: 19/19

---

## Section 3: Summarizing with dplyr

## Section 3 Overview

No problem scores in this section

### 3.1 Summarizing with dplyr (8/8) 100%

Assessment

Problem Scores: 8/8

---

## Section 4: Gapminder

## Section 4 Overview

No problem scores in this section

### 4.1 Introduction to Gapminder

No problem scores in this section

### 4.2 Using the Gapminder Dataset (14/14) 100%

Assessment

Problem Scores: 14/14

## Section 5: Data Visualization Principles

### Section 5 Overview

No problem scores in this section

### 5.1 Data Visualization Principles, Part 1 (5/5) 100%

Assessment

Problem Scores: 5/5

### 5.2 Data Visualization Principles, Part 2 (7.5/7.5) 100%

Assessment

Problem Scores: 7.5/7.5

### 5.3 Data Visualization Principles, Part 3 (7.5/7.5) 100%

Assessment

Problem Scores: 7.5/7.5

### End of Course Survey

No problem scores in this section

# HONOR CODE CERTIFICATE



**Rafael A. Irizarry**

Professor of Biostatistics

*Harvard T.H. Chan School of Public Health*

Professor of Biostatistics  
and Computational Biology  
*Dana Farber Cancer Institute*

# Sandipan Dey

successfully completed and received a passing grade in

## PH525.1x: Statistics and R for the Life Sciences

a course of study offered by HarvardX, an online learning initiative of Harvard University through edX.

**HONOR CODE CERTIFICATE**

Issued July 25, 2015

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# HONOR CODE CERTIFICATE



**Rafael A. Irizarry**

Professor of Biostatistics

*Harvard T.H. Chan School of Public Health*

Professor of Biostatistics  
and Computational Biology  
*Dana Farber Cancer Institute*

# Sandipan Dey

successfully completed and received a passing grade in

## **PH525.2x: Introduction to Linear Models and Matrix Algebra**

a course of study offered by HarvardX, an online learning initiative of Harvard University through edX.

**HONOR CODE CERTIFICATE**

Issued July 24, 2015

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# HONOR CODE CERTIFICATE



**Rafael A. Irizarry**

Professor of Biostatistics

*Harvard T.H. Chan School of Public Health*

Professor of Biostatistics  
and Computational Biology  
*Dana Farber Cancer Institute*

# Sandipan Dey

successfully completed and received a passing grade in

## **PH525.3x: Advanced Statistics for the Life Sciences**

a course of study offered by HarvardX, an online learning initiative of Harvard University through edX.

**HONOR CODE CERTIFICATE**

Issued August 21, 2015

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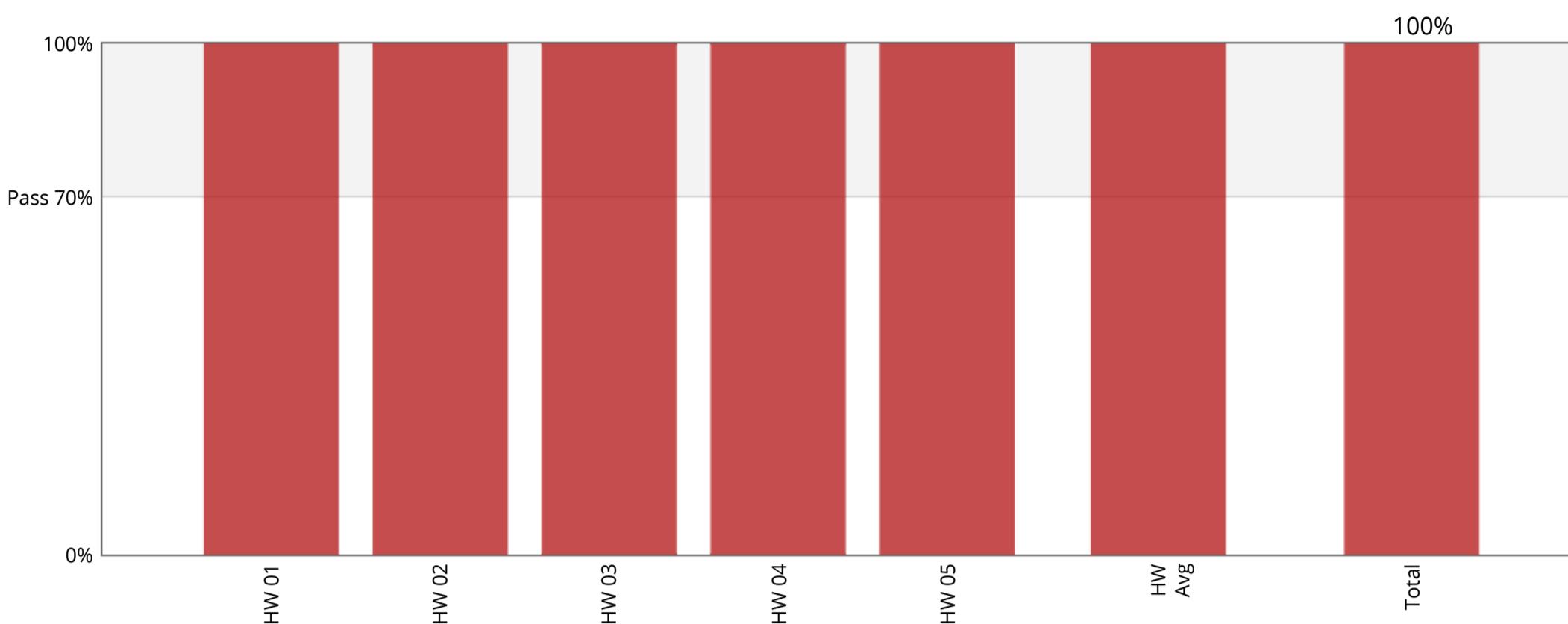
<https://verify.edx.org/cert/11b4767eab7c41d297cd3a853aa21ca7>



## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Introduction and Resources

#### Welcome and Frequently Asked Questions

No problem scores in this section

#### Course Materials and R Resources

No problem scores in this section

#### Pre-Course Survey

No problem scores in this section

### Week 1

#### Introduction and Motivation (10/10) 100%

##### Homework

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1

### Week 2

#### Error rates and procedures (18/18) 100%

##### Homework

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Week 3

#### Statistical Models (20/20) 100%

##### Homework

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Week 4

#### Hierarchical Modeling (11/11) 100%

##### Homework

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1

#### Exploratory Data Analysis (4/4) 100%

##### Homework

Problem Scores: 1/1 1/1 1/1 1/1

#### Data Analysis for Life Sciences Series

No problem scores in this section

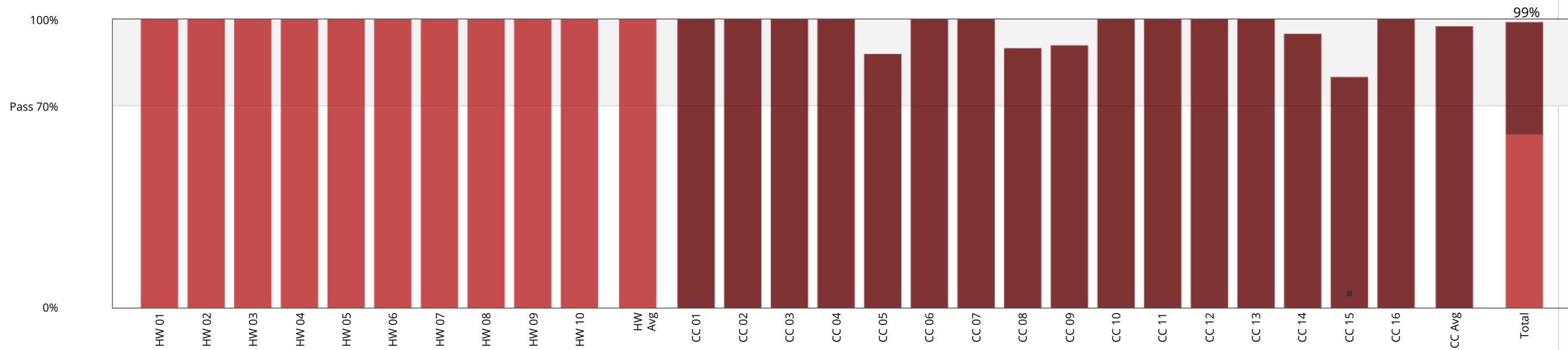




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Week 0: Introductions and Self-Assessment

#### Introduction and Welcome (0/4)

Practice Scores: 0/2 0/2

#### Pre-Quiz Self-Assessment (0/15)

Practice Scores: 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1

#### Important Pre-Course Survey

No problem scores in this section

### Week 1: Basics of Python 3

## Week 1 Overview

No problem scores in this section

### Part 1: Objects and Methods (13/13) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Part 2: Sequence Objects (21/21) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 1/1 1/1 1/1

### Part 3: Manipulating Objects (20/20) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Homework: Week 1 (14/14) 100%

Homework

Problem Scores: 14/14

---

Week 2: Python Libraries and Concepts Used in Research

## Week 2 Overview

No problem scores in this section

### Part 1: Scope Rules and Classes (3/3) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1

### Part 2: NumPy (7/8) 88%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1

### Part 3: Matplotlib and Pyplot (6/6) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

### Part 4: Randomness and Time (13/13) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Homework: Week 2 (13/13) 100%

Homework

Problem Scores: 13/13

---

Week 3: Case Studies Part 1

### Week 3 Overview

No problem scores in this section

#### Case Study 1: DNA Translation (9/10) 90%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1

#### Homework: Case Study 1 (4/4) 100%

Homework

Problem Scores: 4/4

#### Case Study 2: Language Processing (10/11) 91%

Comprehension Check

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

#### Homework: Case Study 2 (4/4) 100%

Homework

Problem Scores: 4/4

#### Case Study 3: Introduction to Classification (13/13) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

#### Homework: Case Study 3 (9/9) 100%

Homework

Problem Scores: 9/9

---

Week 4: Case Studies Part 2

## Week 4 Overview

No problem scores in this section

### Case Study 4: Classifying Whiskies (11/11) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Homework: Case Study 4 (7/7) 100%

Homework

Problem Scores: 7/7

### Case Study 5: Bird Migration (6/6) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

### Homework: Case Study 5 (4/4) 100%

Homework

Problem Scores: 4/4

### Case Study 6: Social Network Analysis (16/16) 100%

Comprehension Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Homework: Case Study 6 (7/7) 100%

Homework

Problem Scores: 7/7

---

Week 5: Statistical Learning

## Week 5 Overview

No problem scores in this section

### Part 1: Linear Regression (18/19) 95%

Comprehension Check

Problem Scores: 1/1    1/1    0/1    1/1    1/1    1/1    1/1    1/1    1/1    1/1    1/1    1/1    1/1    1/1    1/1    2/2  
1/1    1/1

### Part 2: Logistic Regression (8/10) 80%

Comprehension Check

Problem Scores: 0/2    1/1    1/1    4/4    1/1    1/1

### Part 3: Random Forest (7/7) 100%

Comprehension Check

Problem Scores: 1/1    2/2    2/2    2/2

### Homework: Case Study 7, Part 1 (6/6) 100%

Homework

Problem Scores: 6/6

### Homework: Case Study 7, Part 2 (7/7) 100%

Homework

Problem Scores: 7/7

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End of Course Survey

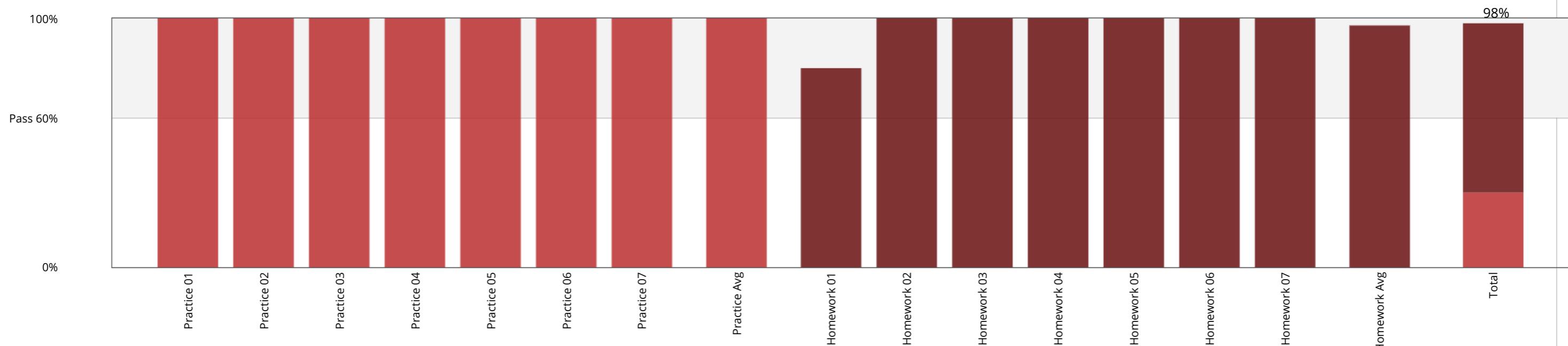
### End of Course Survey

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Unit 0: Introduction and Course Orientation

#### Introduction to the Course

Practice Scores: 0/0 0/0 0/0 0/0 0/0

#### Introduce Yourself

No problem scores in this section

#### Unit 0 Help and Discussion Forum

No problem scores in this section

### Unit 1: Probability, Counting, and Story Proofs

## 1.0 Introduction

No problem scores in this section

## 1.1 Reading

No problem scores in this section

## 1.2 Interactive: Birthday Problem

No problem scores in this section

## 1.3 Practice Problems (6/6) 100%

Practice Problems

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

## 1.3.5 Unit 1 Content and Practice Problem Help & Discussion Forum

No problem scores in this section

## 1.4 Homework Problems (8/10) 80%

Homework Problems

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 0/1

## 1.4.5 Unit 1 Homework Discussion ONLY Forum

No problem scores in this section

---

Unit 2: Conditional Probability  
and Bayes' Rule

## 2.0 Introduction

No problem scores in this section

## 2.1 Reading

No problem scores in this section

## 2.2 Interactive: Monty Hall Simulation

No problem scores in this section

## 2.3 Practice Problems (7/7) 100%

Practice Problems

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## 2.3.5 Unit 2 Content and Practice Problem Help & Discussion Forum

No problem scores in this section

## 2.4 Homework Problems (6/6) 100%

Homework Problems

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

## 2.4.5 Unit 2 Homework Discussion ONLY Forum

No problem scores in this section

---

Unit 3: Discrete Random Variables

### 3.0 Introduction

No problem scores in this section

### 3.1 Reading

No problem scores in this section

### 3.2 Interactive: Normalization

No problem scores in this section

### 3.3 Practice Problems (6/6) 100%

Practice Problems

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

### 3.3.5 Unit 3 Content and Practice Problem Help & Discussion Forum

No problem scores in this section

### 3.4 Homework Problems (7/7) 100%

Homework Problems

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### 3.5 Unit 3 Homework Discussion ONLY Forum

No problem scores in this section

---

Unit 4: Continuous Random Variables

#### 4.0 Introduction

No problem scores in this section

#### 4.1 Reading

No problem scores in this section

#### 4.2 Interactive: PDF/CDF

No problem scores in this section

#### 4.3 Practice Problems (8/8) 100%

Practice Problems

Problem Scores: 1/1    3/3    1/1    1/1    1/1    1/1

#### 4.3.5 Unit 4 Content and Practice Problem Help & Discussion Forum

No problem scores in this section

#### 4.4 Homework Problems (4/4) 100%

Homework Problems

Problem Scores: 1/1    1/1    1/1    1/1

#### 4.5 Unit 4 Homework Discussion ONLY Forum

No problem scores in this section

---

Unit 5: Averages, Law of Large  
Numbers, and Central Limit  
Theorem

## 5.0 Introduction

No problem scores in this section

## 5.1 Reading

No problem scores in this section

## 5.2 Interactives: Bus Stop Paradox and Central Limit Theorem

No problem scores in this section

## 5.3 Practice Problems (8/8) 100%

Practice Problems

Problem Scores: 1/1    1/1    1/1    1/1    1/1    1/1    1/1

## 5.3.5 Unit 5 Content and Practice Problem Help & Discussion Forum

No problem scores in this section

## 5.4 Homework Problems (5/5) 100%

Homework Problems

Problem Scores: 2/2    1/1    1/1    1/1

## 5.5 Unit 5 Homework Discussion ONLY Forum

No problem scores in this section

---

Unit 6: Joint Distributions and  
Conditional Expectation

## 6.0 Introduction

No problem scores in this section

## 6.1 Reading

No problem scores in this section

## 6.2 Interactives: Bivariate Normal, Patterns in Sequences, Bayesian Updating

No problem scores in this section

## 6.3 Practice Problems (8/8) 100%

Practice Problems

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 2/2

## 6.3.5 Unit 6 Content and Practice Problem Help & Discussion Forum

No problem scores in this section

## 6.4 Homework Problems (9/9) 100%

Homework Problems

Problem Scores: 1/1 1/1 1/1 1/1 2/2 1/1 1/1 1/1

## 6.5 Unit 6 Homework Discussion ONLY Forum

No problem scores in this section

---

Unit 7: Markov Chains

## 7.0 Introduction

No problem scores in this section

## 7.1 Reading

No problem scores in this section

## 7.2 Interactive: Markov Chain Simulation

No problem scores in this section

## 7.3 Practice Problems (9/9) 100%

Practice Problems

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 3/3

## 7.3.5 Unit 7 Content and Practice Problem Help & Discussion Forum

No problem scores in this section

## 7.4 Homework Problems (8/8) 100%

Homework Problems

Problem Scores: 1/1 1/1 2/2 1/1 3/3

## 7.5 Unit 7 Homework Discussion ONLY Forum

No problem scores in this section

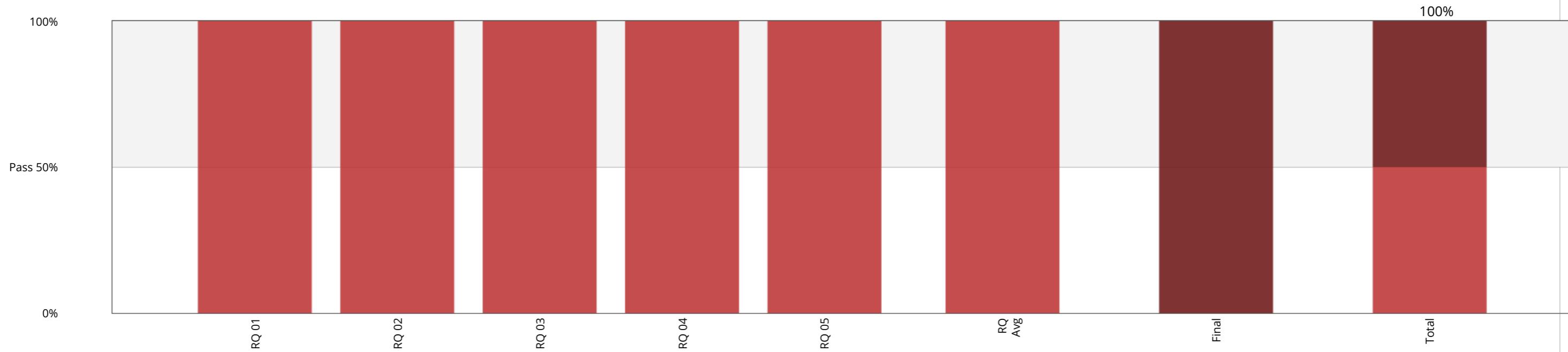
## Post-Course Survey

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



Welcome!

### General Information

No problem scores in this section

### Learning Objectives

No problem scores in this section

### Syllabus

No problem scores in this section

### Grading Scheme

No problem scores in this section

### Change Log

No problem scores in this section

### Copyrights and Trademarks

No problem scores in this section

## Module 1 - Introduction

### Introduction to Data Analysis with Python 0:51

No problem scores in this section

### The Problem 1:51

No problem scores in this section

### Understanding the Data 2:27

No problem scores in this section

### Python Packages for Data Science 2:28

No problem scores in this section

### Importing and Exporting Data in Python 4:13

No problem scores in this section

### Getting Started Analyzing Data in Python 4:14

No problem scores in this section

### Lab 1: Introduction

No problem scores in this section

### Graded Review Questions (7/7) 100%

Review Question

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Module 2 - Data Wrangling

[Pre-processing Data in Python 2:09](#)

No problem scores in this section

[Dealing with Missing Values in Python 5:57](#)

No problem scores in this section

[Data Formatting in Python 3:23](#)

No problem scores in this section

[Data Normalization in Python 3:34](#)

No problem scores in this section

[Binning in Python 1:53](#)

No problem scores in this section

[Turning categorical variables into quantitative variables in Python 2:00](#)

No problem scores in this section

[Lab 2: Data Wrangling](#)

No problem scores in this section

[Graded Review Questions](#) (6/6) 100%

Review Question

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

---

Module 3 Exploratory Data Analysis

[Exploratory Data Analysis 1:20](#)

No problem scores in this section

[Descriptive Statistics 4:39](#)

No problem scores in this section

[GroupBy in Python 3:20](#)

No problem scores in this section

[Analysis of Variance ANOVA 3:58](#)

No problem scores in this section

[Correlation 2:29](#)

No problem scores in this section

[Correlation - Statistics 2:37](#)

No problem scores in this section

[Lab 3 : Exploratory Data Analysis](#)

No problem scores in this section

[Graded Review Questions](#) (5/5) 100%

Review Question

Problem Scores:    1/1    1/1    1/1    1/1    1/1

---

## Module 4 Model Development

[Model Development 1:44](#)

No problem scores in this section

[Linear Regression and Multiple Linear Regression 6:34](#)

No problem scores in this section

[Model Evaluation using Visualization 4:44](#)

No problem scores in this section

[Polynomial Regression and Pipelines 4:25](#)

No problem scores in this section

[Measures for In-Sample Evaluation 3:37](#)

No problem scores in this section

[Prediction and Decision Making](#)

No problem scores in this section

[Lab 4: Model Development](#)

No problem scores in this section

[Graded Review Questions \(5/5\) 100%](#)

Review Question

Problem Scores: 1/1 1/1 1/1 1/1 1/1

---

## Module 5 – Model Evaluation

[Model Evaluation and Refinement 0:22](#)

No problem scores in this section

[Model Evaluation 7:31](#)

No problem scores in this section

[Overfitting, Underfitting and Model Selection 4:21](#)

No problem scores in this section

[Ridge Regression 4:27](#)

No problem scores in this section

[Grid Search 4:34](#)

No problem scores in this section

[Lab 5: Model Evaluation and Refinement](#)

No problem scores in this section

[Graded Review Questions](#) (5/5) 100%

Review Question

Problem Scores: 1/1 1/1 1/1 1/1 1/1

---

**Exam**[Exam Instructions](#)

No problem scores in this section

[Exam](#) (20/20) 100%

Final Exam

Problem Scores: 1/1

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**Course Rating**[Course Rating](#)

No problem scores in this section

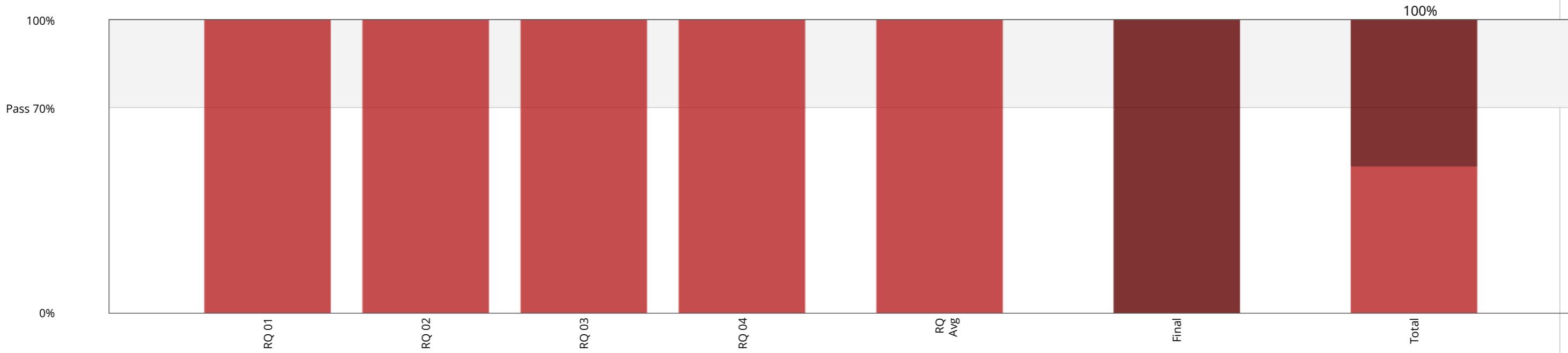
You are taking "Final Exam" as a timed exam. The timer on the right shows the time remaining in the exam. To receive credit for problems, you must select "Submit" for each problem before you select "End My Exam".

0:19:59 ⏳

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Welcome!

#### [Welcome! \(3:44\)](#)

No problem scores in this section

### About this course

### General Information

No problem scores in this section

### Learning Objectives

No problem scores in this section

### Syllabus

No problem scores in this section

### Grading Scheme

No problem scores in this section

### Copyrights and Trademarks

No problem scores in this section

## Module 1 - Introduction to Deep Learning

### Learning Objectives

No problem scores in this section

### Introduction to Deep Learning (4:39)

No problem scores in this section

### Neurons and Neural Networks (3:26)

No problem scores in this section

### Artificial Neural Networks (5:29)

No problem scores in this section

### Review Questions (5/5) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Module 2 - Artificial Neural Networks

### Learning Objectives

No problem scores in this section

### Gradient Descent (5:39)

No problem scores in this section

### Backpropagation (9:19)

No problem scores in this section

### Vanishing Gradient (1:45)

No problem scores in this section

### Activation Functions (5:21)

No problem scores in this section

### Review Questions (5/5) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Module 3 - Keras and Deep Learning Libraries

### Learning Objectives

No problem scores in this section

### Deep Learning Libraries (3:41)

No problem scores in this section

### Regression Models with Keras (6:30)

No problem scores in this section

### Classification Models with Keras (5:47)

No problem scores in this section

### Lab - Regression Models with Keras

No problem scores in this section

### Lab - Classification Models with Keras

No problem scores in this section

### Review Questions (5/5) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Module 4 - Deep Learning Models

### Learning Objectives

No problem scores in this section

### Shallow versus Deep Neural Networks (3:20)

No problem scores in this section

### Convolutional Neural Networks (8:13)

No problem scores in this section

### Recurrent Neural Networks (2:53)

No problem scores in this section

### Autoencoders (2:52)

No problem scores in this section

### Lab - Convolutional Neural Networks with Keras

No problem scores in this section

### Review Questions (5/5) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Summary

### Summary (1:34)

No problem scores in this section

## Final Exam

### Instructions

No problem scores in this section

### Final Exam (20/20) 100%

Final Exam

Problem Scores: 1/1

## Course Rating

### Course Rating

No problem scores in this section

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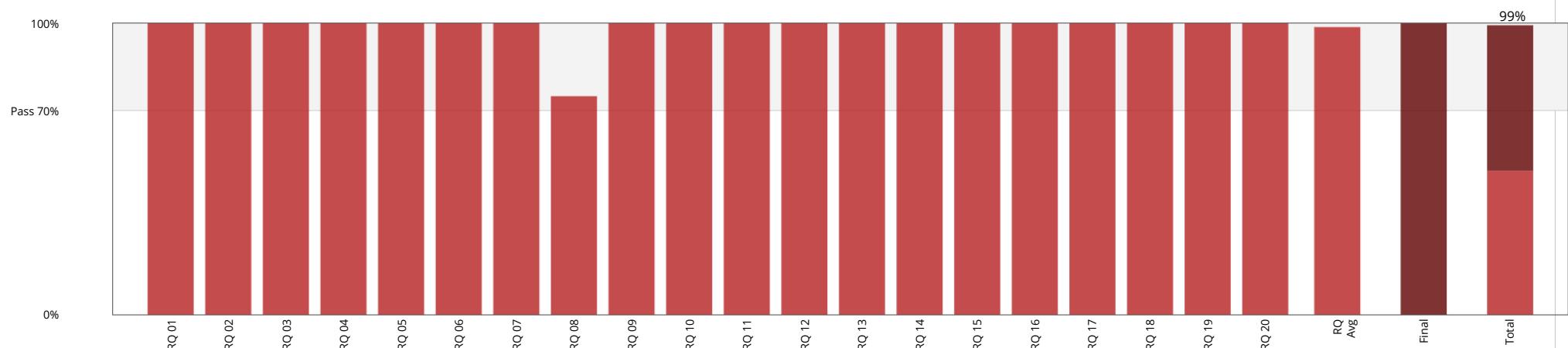
x



## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



Welcome!

### Welcome!

No problem scores in this section

About this course

General Information

No problem scores in this section

Learning Objectives

No problem scores in this section

Syllabus

No problem scores in this section

Grading Scheme

No problem scores in this section

Copyrights and Trademarks

No problem scores in this section

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1.0 Tensors and GradientsOverview

No problem scores in this section

1.1 Tensors (7/7) 100%

Quiz

Problem Scores: 1/1 1/1 1/1 1/1 1/1 2/2

1.2 Derivatives (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

1.3 Dataset Class (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

---

2.0 Fundamentals of Pytorch  
with Linear Regression

[2.1 Linear Regression in 1D - Prediction](#) (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

[2.2 Linear Regression Training](#) (12/12) 100%

Quiz

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[2.3 Stochastic, Batch and Mini-Batch Gradient Descent](#) (4/4) 100%

Quiz

Problem Scores: 1/1 1/1 1/1 1/1

[2.4 PyTorch Way](#) (3/3) 100%

Quiz

Problem Scores: 1/1 1/1 1/1

[2.5 Model Validation](#) (3/4) 75%

Quiz

Problem Scores: 0/1 1/1 1/1 1/1

[2.6 Higher Dimensional Linear Regression](#) (8/8) 100%

Quiz

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

---

## 3.0 Logistic and Softmax Regression

[3.1 Logistic Regression Prediction](#) (5/5) 100%

Quiz

Problem Scores: 1/1 1/1 1/1 1/1 1/1

[3.2 Training Logistic Regression](#) (8/8) 100%

Quiz

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[3.3 Softmax Regression](#) (5/5) 100%

Quiz

Problem Scores: 1/1 1/1 1/1 1/1 1/1

---

## 4.0 Feedforward Neural Network

[4.1 Neural Networks](#) (11/11) 100%

Quiz

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[4.2 Back Propagation](#) (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

[4.3 Activation Functions](#) (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

[4.4 Building Deep Networks In Pytorch](#) (5/5) 100%

Quiz

Problem Scores: 1/1 2/2 1/1 1/1

## 5.0 Deep Networks

[5.1 Dropout](#) (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

[5.2 Initialization](#) (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

[5.3 Gradient Descent with Momentum](#)

Quiz

No problem scores in this section

[5.4 Batch Normalization](#)

Quiz

No problem scores in this section

6.0 Introduction to Networks  
for Computer vision

[6.1 Intro to Convolution](#) (8/8) 100%

Quiz

Problem Scores: 1/1 1/1 2/2 1/1 1/1 1/1 1/1

[6.2 Convolutional Neural Network](#) (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

[6.3 Pre trained Networks](#)

Quiz

No problem scores in this section

## Final Exam

[Final Exam](#) (20/20) 100%

Final Exam

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Course Rating

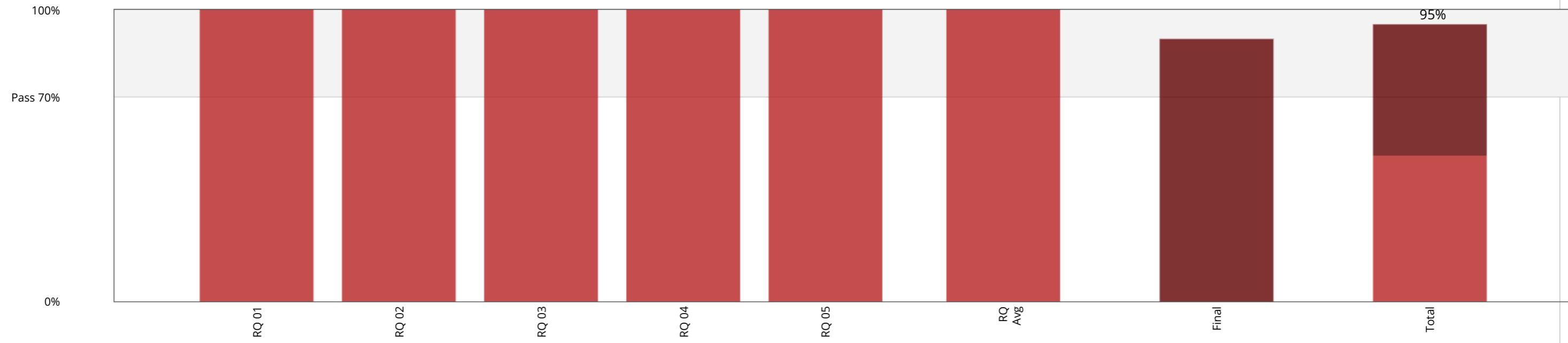
[Course Rating](#)

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Welcome!

#### [Welcome! \(2:06\)](#)

No problem scores in this section

### About this course

### General Information

No problem scores in this section

### Learning Objectives

No problem scores in this section

### Syllabus

No problem scores in this section

### Grading Scheme

No problem scores in this section

### Change Log

No problem scores in this section

### Copyrights and Trademarks

No problem scores in this section

---

Module 1 - Intro to TensorFlow

### Learning Objectives

No problem scores in this section

#### Intro to TensorFlow (7:00)

No problem scores in this section

#### Lab: Hello world

No problem scores in this section

#### Lab: Linear Regression with TensorFlow

No problem scores in this section

#### Lab: Logistic Regression with TensorFlow

No problem scores in this section

#### Intro to Deep Learning (2:39)

No problem scores in this section

#### Deep Neural Networks (11:48)

No problem scores in this section

### Graded Review Questions (5/5) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1 1/1 1/1

---

## Module 2 - Convolutional Networks

### Learning Objectives

No problem scores in this section

#### Intro to CNNs (4:37)

No problem scores in this section

#### CNNs for Classification (4:09)

No problem scores in this section

#### CNN Architecture (13:05)

No problem scores in this section

#### Lab: Understanding Convolutions

No problem scores in this section

#### Lab: CNN with TensorFlow

No problem scores in this section

#### Graded Review Questions (5/5) 100%

Review Questions

Problem Scores:    1/1    1/1    1/1    1/1    1/1

---

Module 3 - Recurrent Neural Networks (RNNs)

### Learning Objectives

No problem scores in this section

### The Sequential Problem (3:06)

No problem scores in this section

### The RNN Model (5:28)

No problem scores in this section

### The LSTM Model (5:25)

No problem scores in this section

### Lab: Basics of LSTM

No problem scores in this section

### Applying RNNs to Language Modelling (7:38)

No problem scores in this section

### Lab: Language Modelling with LSTM

No problem scores in this section

### Graded Review Questions (5/5) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1 1/1 1/1

---

Module 4 - Restricted  
Boltzmann Machines (RBMs)

## Learning Objectives

No problem scores in this section

### Intro to RBMs (4:29)

No problem scores in this section

### Training RBMs (4:16)

No problem scores in this section

## Lab: Restricted Boltzmann Machines

No problem scores in this section

## Lab: Collaborative Filtering with RBM

No problem scores in this section

## Graded Review Questions (5/5) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Module 5 - Autoencoders

### Intro to Autoencoders (4:51)

No problem scores in this section

### Autoencoder Structure(4:10)

No problem scores in this section

## Lab: Autoencoders

No problem scores in this section

## Graded Review Questions (5/5) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Final Exam

### Instructions

No problem scores in this section

### Final Exam (18/20) 90%

Final Exam

Problem Scores: 1/1 0/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Course Rating

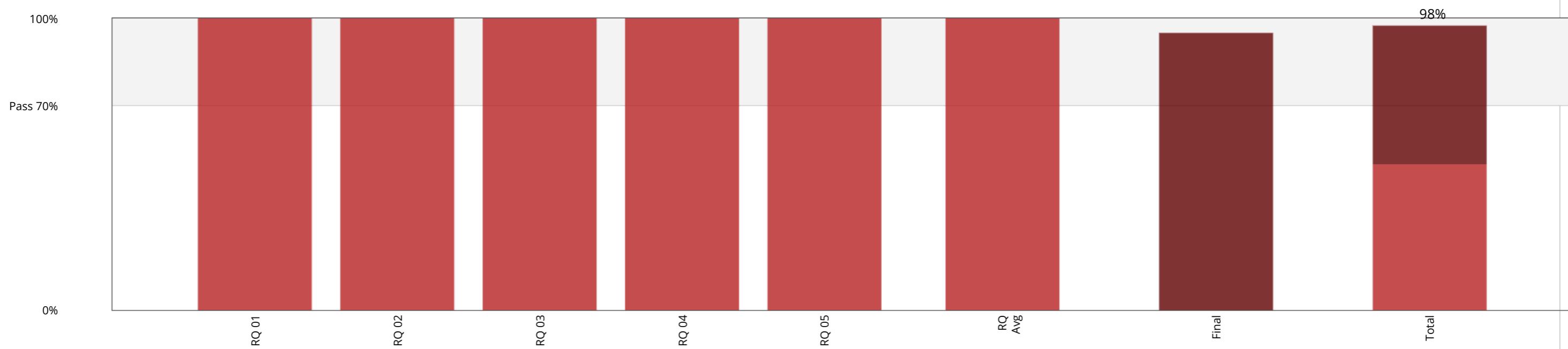
### Course Rating

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Welcome!

#### [Welcome! \(3:15\)](#)

No problem scores in this section

### About this course

### General Information

No problem scores in this section

### Learning Objectives

No problem scores in this section

### Syllabus

No problem scores in this section

### Grading Scheme

No problem scores in this section

### Change Log

No problem scores in this section

### Copyrights and Trademarks

No problem scores in this section

## Module 1 - Machine Learning

### Learning Objectives

No problem scores in this section

### Intro to Machine Learning (8:49)

No problem scores in this section

### Python for Machine Learning (6:10)

No problem scores in this section

### Supervised vs Unsupervised (5:59)

No problem scores in this section

### Graded Review Questions (3/3) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1

## Module 2 - Regression

### Learning Objectives

No problem scores in this section

#### Intro to Regression (4:52)

No problem scores in this section

#### Simple Linear Regression (12:50)

No problem scores in this section

#### Lab: Simple Linear Regression

No problem scores in this section

#### Multiple Linear Regression (13:39)

No problem scores in this section

#### Lab: Multiple Linear Regression

No problem scores in this section

#### Model Evaluation (8:27)

No problem scores in this section

#### Evaluation Metrics (3:06)

No problem scores in this section

#### Non-Linear Regression (7:35)

No problem scores in this section

#### Lab: Non-Linear Regression

No problem scores in this section

### Graded Review Questions (3/3) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1

---

Module 3 - Classification

## Learning Objectives

No problem scores in this section

### Intro to Classification (3:53)

No problem scores in this section

### K-Nearest Neighbors (9:12)

No problem scores in this section

### Evaluation Metrics (7:09)

No problem scores in this section

## Lab: KNN

No problem scores in this section

### Intro to Decision Trees (4:02)

No problem scores in this section

### Building Decision Trees (10:37)

No problem scores in this section

## Lab: Decision Trees

No problem scores in this section

### Intro to Logistic Regression (7:55)

No problem scores in this section

### Logistic vs Linear Regression (29:20)

No problem scores in this section

## Lab: Logistic Regression

No problem scores in this section

### Support Vector Machine (8:52)

No problem scores in this section

## Lab: Support Vector Machines

No problem scores in this section

### Graded Review Questions (3/3) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1

## Module 4 - Clustering

### Learning Objectives

No problem scores in this section

### Intro to Clustering.(8:01)

No problem scores in this section

### K-Means Clustering.(9:43)

No problem scores in this section

### More on K-Means.(3:47)

No problem scores in this section

### Lab: K-Means

No problem scores in this section

### Hierarchical Clustering.(6:18)

No problem scores in this section

### More on Hierarchical Clustering.(5:51)

No problem scores in this section

### Lab: Hierarchical Clustering

No problem scores in this section

### DBSCAN Clustering.(6:57)

No problem scores in this section

### Lab: DBSCAN Clustering

No problem scores in this section

### Graded Review Questions.(3/3) 100%

Review Questions

Problem Scores:    1/1    1/1    1/1

---

## Module 5 - Recommender Systems

### Learning Objectives

No problem scores in this section

### Recommender Systems (4:33)

No problem scores in this section

### Content-based (5:12)

No problem scores in this section

### Lab: Content-based

No problem scores in this section

### Collaborative Filtering (7:06)

No problem scores in this section

### Lab: Collaborative Filtering

No problem scores in this section

### Graded Review Questions (3/3) 100%

Review Questions

Problem Scores: 1/1 1/1 1/1

## Final Exam

### Instructions

No problem scores in this section

### Final Exam (19/20) 95%

Final Exam

Problem Scores: 1/11/1 1/1 1/1 0/1

## Course Rating

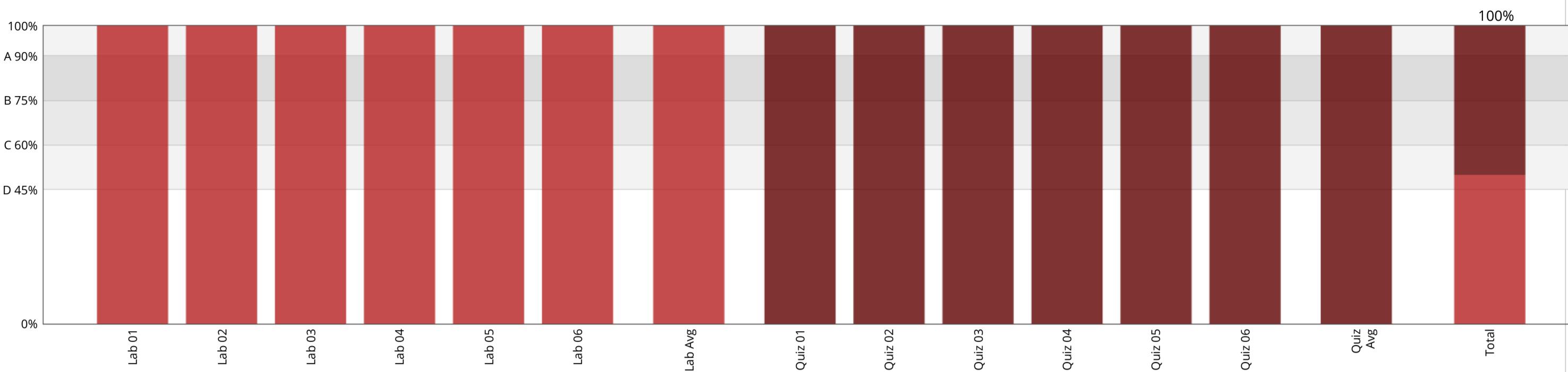
### Course Rating

No problem scores in this section

## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)

## Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



## About this course

[Welcome!](#) (0/7) 0%

Practice Scores: 0/7

[Using edX](#)

No problem scores in this section

## Part 1: Fundamentals of Graph Theory, Problem Solving, Good Programming Practices

[1. Addressing a Computational Problem](#) (3/3) 100%

Practice Scores: 3/3

[2. Graphs and Paths](#) (5/5) 100%

Practice Scores: 5/5

[3. Representing Graphs](#) (2/2) 100%

Practice Scores: 2/2

[4. Good programming practices](#) (2/2) 100%

Practice Scores: 2/2

[Quiz 1](#) (8/8) 100%

Quiz

Problem Scores: 8/8

[Lab 1](#) (7/7) 100%

Lab

Problem Scores: 7/7

## Part 2: Graph Traversal, Routing, Queuing Structures

[1. Graph Traversal](#) (3/3) 100%

Practice Scores: 3/3

[2. Routing tables](#) (3/3) 100%

Practice Scores: 3/3

[3. Queuing Structures](#) (3/3) 100%

Practice Scores: 3/3

[Quiz 2](#) (4/4) 100%

Quiz

Problem Scores: 4/4

[Lab 2](#) (5/5) 100%

Lab

Problem Scores: 5/5

## Part 3: Shortest Paths, Min-Heaps, Algorithmic Complexity

[1. Dijkstra's Algorithm](#) (3/3) 100%

Practice Scores: 3/3

[2. Min-heaps](#) (3/3) 100%

Practice Scores: 3/3

[3. Algorithm complexity](#) (3/3) 100%

Practice Scores: 3/3

[Quiz 3](#) (6/6) 100%

Quiz

Problem Scores: 6/6

[Lab 3](#) (4/4) 100%

Lab

Problem Scores: 4/4

Part 4: NP-Completeness,  
Traveling Salesman Problem,  
Backtracking

[1. Traveling Salesman Problem](#) (3/3) 100%

Practice Scores: 3/3

[2. Bruteforce and Backtracking to solve NP-Complete Problems](#) (3/3) 100%

Practice Scores: 3/3

[3. Problem Complexity and NP-Completeness](#) (3/3) 100%

Practice Scores: 3/3

[Quiz 4](#) (5/5) 100%

Quiz

Problem Scores: 5/5

[Lab 4](#) (5/5) 100%

Lab

Problem Scores: 5/5

Part 5: Heuristics, Greedy  
Approaches,  
Accuracy/Complexity tradeoff

[1. Heuristics](#) (2/2) 100%

Practice Scores: 2/2

[2. Greedy Algorithms](#) (2/2) 100%

Practice Scores: 2/2

[3. Approximate Solutions](#) (3/3) 100%

Practice Scores: 3/3

[Quiz 5](#) (5/5) 100%

Quiz

Problem Scores: 5/5

[Lab 5](#) (4/4) 100%

Lab

Problem Scores: 4/4

Part 6: Combinatorial Game  
Theory, Winning Strategies

[1. Combinatorial Game Theory](#) (2/2) 100%

Practice Scores: 2/2

[2. Computing Winning Positions in a Game](#) (2/2) 100%

Practice Scores: 2/2

[Quiz 6](#) (5/5) 100%

Quiz

Problem Scores: 5/5

[Lab 6](#) (5/5) 100%

Lab

Problem Scores: 5/5

# HONOR CODE CERTIFICATE



**Karolinska  
Institutet**

**Andreas Montelius**

Researcher  
*Karolinska Institute*

**Peter Lönnberg**

Bioinformatician  
*Karolinska Institute*

**Mikael Huss**

Bioinformatics Scientist  
*Stockholm University*

**Matilda Utbult**

Teaching Assistant  
*Stockholm University*

# Sandipan Dey

successfully completed and received a passing grade in

## KlexploRx: Explore Statistics with R

a course of study offered by KIx, an online learning initiative of Karolinska Institutet through edX.

**HONOR CODE CERTIFICATE**

Issued October 23rd, 2014

Verify the authenticity of this certificate at

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# HONOR CODE CERTIFICATE



Tetsushi Ito

Associate Professor, Department of Mathematics, Faculty  
of Science

*Kyoto University*

This is to certify that

## Sandipan Dey

successfully completed and received a passing grade in

### 004x: Fun with Prime Numbers: The Mysterious World of Mathematics

a course of study offered by KyotoX, an online learning initiative of Kyoto University  
through edX.

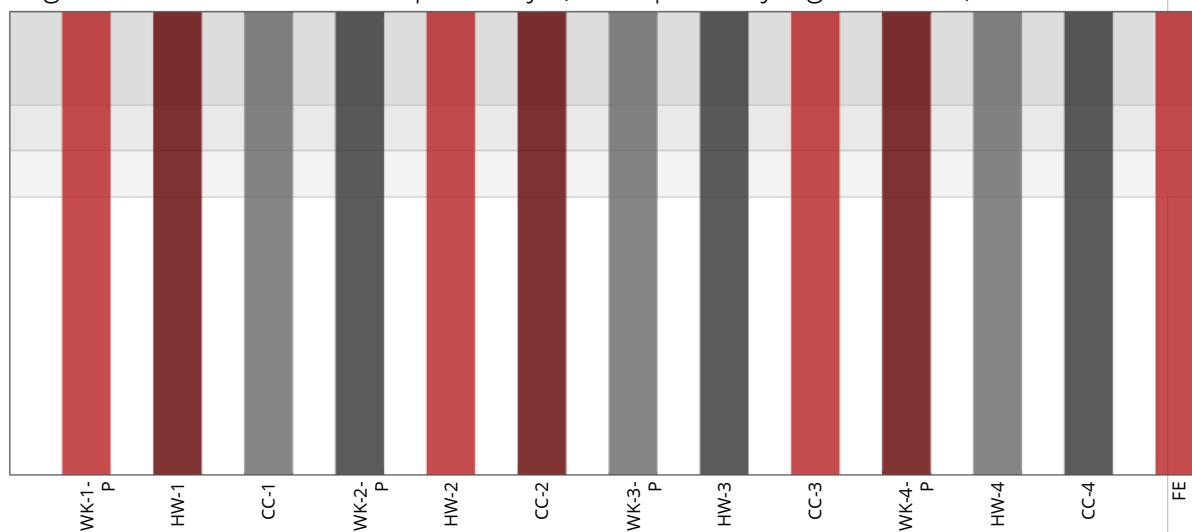


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Issued February 29, 2016

VALID CERTIFICATE ID  
[208317f7f6204d03aa33d7b1db04e970](https://courses.edx.org/certificates/208317f7f6204d03aa33d7b1db04e970)



## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)



## Introduction

## Welcome!

No problem scores in this section

## Meet the Course Staff

No problem scores in this section

## Introduce Yourself

No problem scores in this section

## Entrance Survey

No problem scores in this section

## Week 1

## Introduction to Prime Numbers (9/9) 100%

Week 1 Problems due Jan 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 2/2 1/1 1/1 2/2

## Homework 1 (9/9) 100%

Homework 1 due Jan 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 2/2 4/4

## Completion Checklist 1 (2/2) 100%

Completion Checklist 1 due Jan 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1

## Week 2

## Review of Week 1

No problem scores in this section

## Laws of Prime Numbers (9/9) 100%

Week 2 Problems due Feb 03, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 3/3 3/3 1/1

**Homework 2** (10/10) 100%  
Homework 2 due Feb 03, 2016 at 23:30 UTC

Problem Scores: 1/1 3/3 2/2 4/4

**Completion Checklist 2** (1/1) 100%  
Completion Checklist 2 due Feb 03, 2016 at 23:30 UTC  
Problem Scores: 1/1

---

## Week 3

### Review of Week 2

No problem scores in this section

**Reciprocity Laws and Mystery of Triangles** (9/9) 100%  
Week 3 Problems due Feb 10, 2016 at 23:30 UTC

Problem Scores: 1/1 2/2 1/1 2/2 1/1 1/1 1/1

**Homework 3** (10/10) 100%  
Homework 3 due Feb 10, 2016 at 23:30 UTC  
Problem Scores: 3/3 3/3 4/4

**Completion Checklist 3** (1/1) 100%  
Completion Checklist 3 due Feb 10, 2016 at 23:30 UTC  
Problem Scores: 1/1

**Final Exam** (20/20) 100%  
Final Exam due Feb 17, 2016 at 23:30 UTC  
Problem Scores: 3/3 4/4 3/3 3/3 4/4 3/3

---

## Week 4

### Review of Week 3

No problem scores in this section

**ABC Conjecture and Beyond** (9/9) 100%  
Week 4 Problems due Feb 17, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 2/2 1/1 1/1 2/2

**Homework 4** (9/9) 100%  
Homework 4 due Feb 17, 2016 at 23:30 UTC  
Problem Scores: 1/1 6/6 2/2

### Farewell Message

No problem scores in this section

### Ending Survey

No problem scores in this section

**Completion Checklist 4** (2/2) 100%  
Completion Checklist 4 due Feb 17, 2016 at 23:30 UTC  
Problem Scores: 1/1 1/1

### Review of Week 4

No problem scores in this section

### Review of Final Exam

No problem scores in this section

Japan Gateway:  
Kyoto University  
Top Global  
Program

Japan Gateway: Kyoto University Top Global Program

No problem scores in this section



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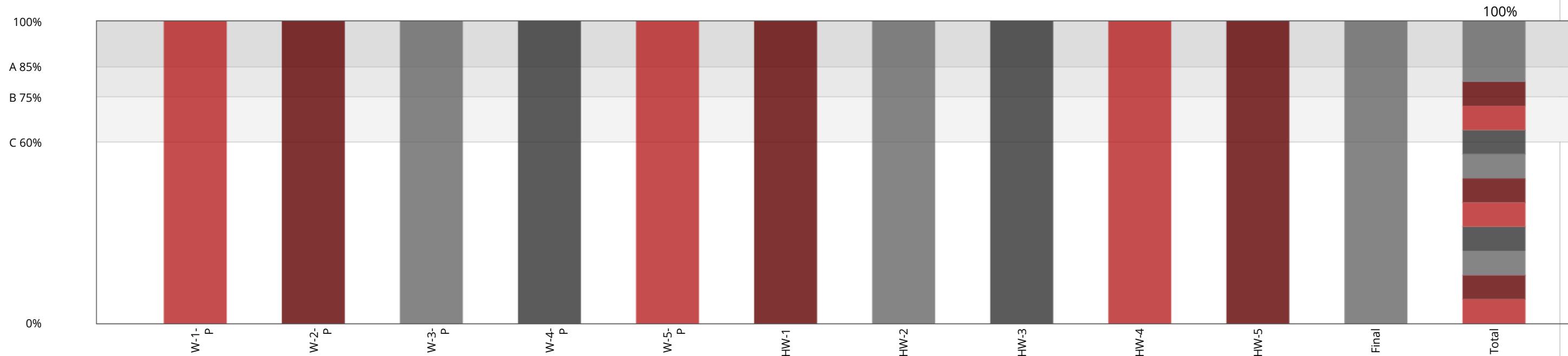
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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Week 0

#### Welcome!

No problem scores in this section

#### Meet the Course Staff

No problem scores in this section

#### Introduce Yourself

No problem scores in this section

#### Entrance Survey

No problem scores in this section

### Week 1

[What are Prime Numbers?](#) (8/8) 100%

Week 1 Problems due Nov 9, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Homework 1](#) (8/8) 100%

Homework 1 due Nov 9, 2017 05:00 IST

Problem Scores: 2/2 2/2 2/2 2/2

## Week 2

[Sums of Two Squares](#) (8/8) 100%

Week 2 Problems due Nov 16, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Homework 2](#) (8/8) 100%

Homework 2 due Nov 16, 2017 05:00 IST

Problem Scores: 2/2 2/2 2/2 2/2

## Week 3

[The Reciprocity Laws](#) (8/8) 100%

Week 3 Problems due Nov 23, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Homework 3](#) (8/8) 100%

Homework 3 due Nov 23, 2017 05:00 IST

Problem Scores: 2/2 2/2 2/2 2/2

## Week 4

[Prime Numbers and Cryptography](#) (8/8) 100%

Week 4 Problems due Nov 30, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Homework 4](#) (8/8) 100%

Homework 4 due Nov 30, 2017 05:00 IST

Problem Scores: 2/2 1/1 1/1 2/2 2/2

## Week 5

[Mystery of Prime Numbers: Past, Present, and Future](#) (8/8) 100%

Week 5 Problems due Dec 7, 2017 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Homework 5](#) (8/8) 100%

Homework 5 due Dec 7, 2017 05:00 IST

Problem Scores: 2/2 2/2 2/2 1/1 1/1

[Final Exam](#) (20/20) 100%

Final Exam due Dec 7, 2017 05:00 IST

Problem Scores: 1/1 1/1 4/4 1/1 1/1 1/1 3/3 3/3 4/4

[Homework 5 Review](#)

No problem scores in this section

[Final Exam Review](#)

No problem scores in this section

[Final Challenge](#)

No problem scores in this section

[Ending Survey](#)

No problem scores in this section

Gateway to Kyoto University

[Japan Gateway: Kyoto University Top Global Program](#)

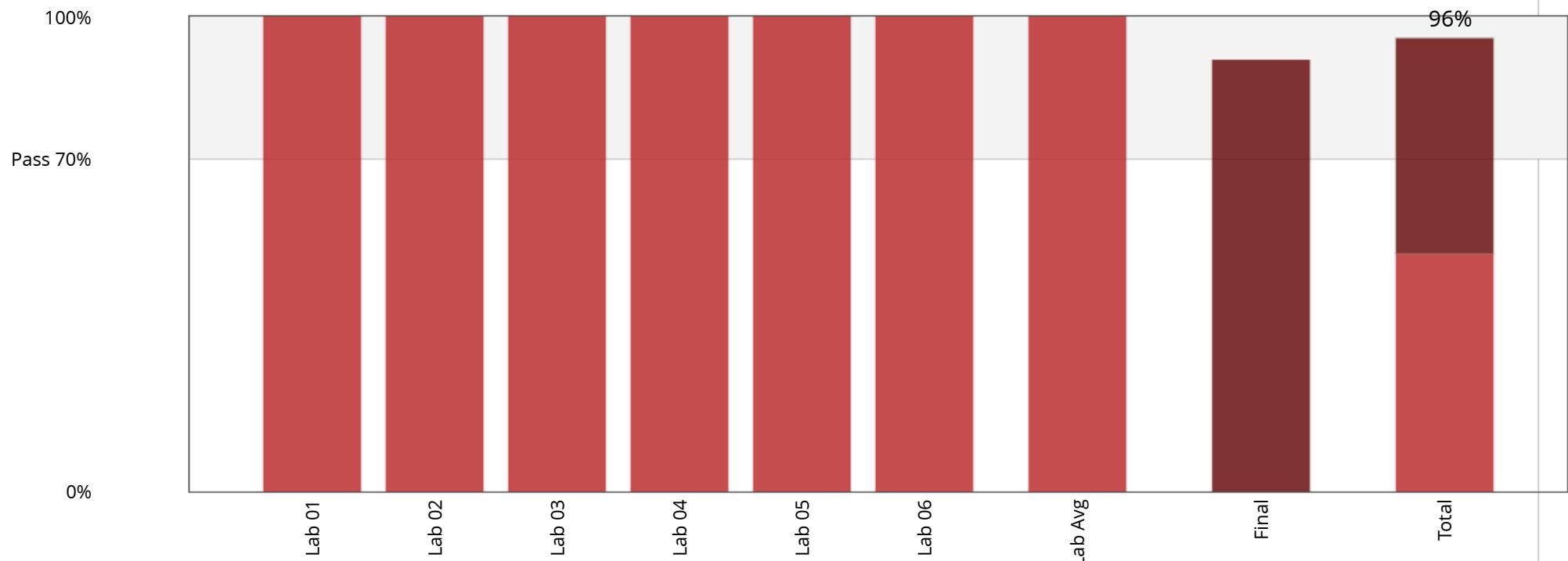
No problem scores in this section



## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Your enrollment: Audit track**

You are enrolled in the audit track for this course. The audit track does not include a certificate.



---

Before You Start

Introduction

None

No problem scores in this section

---

**Module 1:**  
Introduction to Data  
Science

**Principles of Data Science**  
None  
No problem scores in this section

**Data Science Technologies**  
None  
No problem scores in this section

**Lab** (2/2) 100%  
Lab  
Problem Scores: 2/2

---

**Module 2:**  
Probability and  
Statistics for Data  
Science

**Probability and Random Variables**  
None  
No problem scores in this section

**Introduction to Statistics**  
None  
No problem scores in this section

**Lab** (2/2) 100%  
Lab  
Problem Scores: 1/1 1/1

**Module 3:**  
Simulation and  
Hypothesis Testing**Simulation and Confidence Intervals**

None

No problem scores in this section

**Hypothesis Testing**

None

No problem scores in this section

**Lab (2/2) 100%**

Lab

Problem Scores: 2/2

**Module 4: Exploring  
and Visualizing Data****Exploring Data**

None

No problem scores in this section

**Visualizing Data**

None

No problem scores in this section

**Lab (2/2) 100%**

Lab

Problem Scores: 1/1 1/1

**Module 5: Data****Data Ingestion and Flow**

## Cleansing and Manipulation

None

No problem scores in this section

### Data Cleansing

None

No problem scores in this section

**Lab** (2/2) 100%

Lab

Problem Scores: 1/1 1/1

---

## Module 6: Introduction to Machine Learning

### Getting Started with Machine Learning

None

No problem scores in this section

### Publishing a Machine Learning Web Service

None

No problem scores in this section

**Lab** (2/2) 100%

Lab

Problem Scores: 1/1 1/1

---

## Final Exam and Survey

### Course Exam (10/11) 91%

Final Exam

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1

## Post-Course Survey

None

No problem scores in this section



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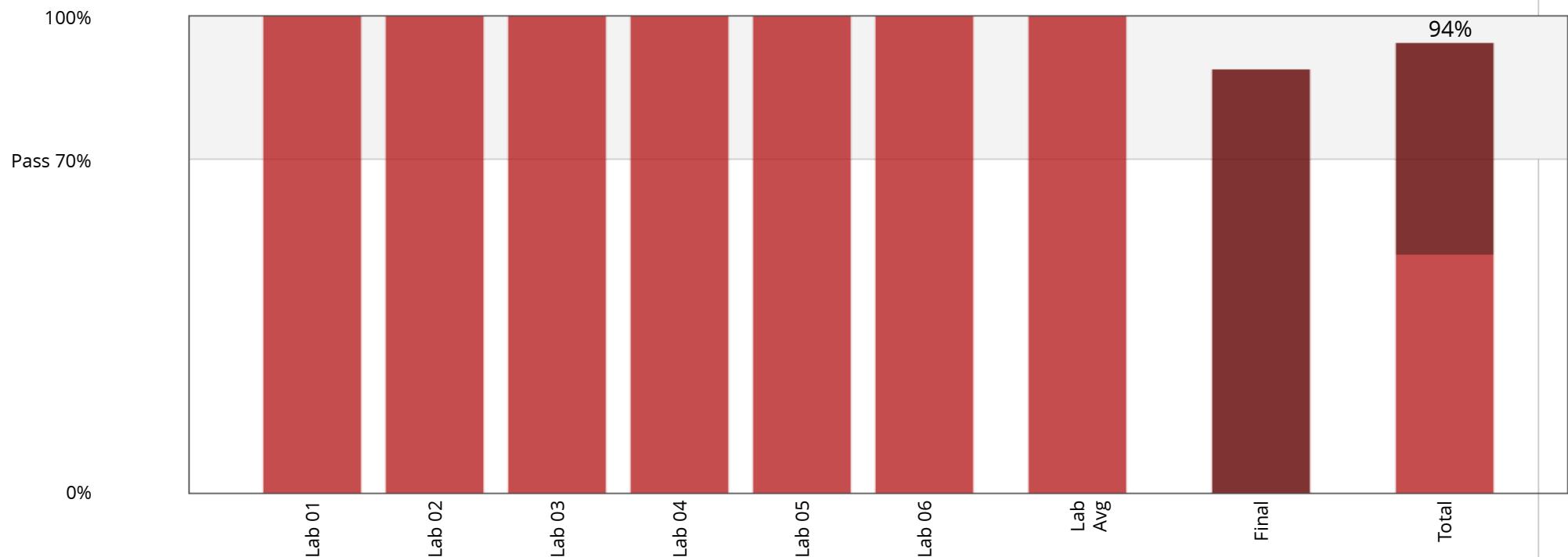




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Your enrollment: Audit track**

You are enrolled in the audit track for this course. The audit track does not include a certificate.



---

Before You Start

Introduction

None

No problem scores in this section

---

## Module 1: Classification

### Lesson 1: Introduction to Classification

None

No problem scores in this section

### Lesson 2: Building Classification Models

None

No problem scores in this section

**Lab** (2/2) 100%

Lab

Problem Scores: 1/1 1/1

---

## Module 2: Regression

### Lesson 1: Introduction to Regression

None

No problem scores in this section

### Lesson 2: Creating Regression Models

None

No problem scores in this section

**Lab** (2/2) 100%

Lab

Problem Scores: 1/1 1/1

**Module 3: Improving Machine Learning Models****Lesson 1: Principles of Model Improvement**

None

No problem scores in this section

**Lesson 2: Techniques for Improving Models**

None

No problem scores in this section

**Lab** (2/2) 100%

Lab

Problem Scores: 1/1 1/1

**Module 4: Tree and Ensemble Methods****Lesson 1: Introduction to Decision Trees**

None

No problem scores in this section

**Lesson 2: Ensemble Methods**

None

No problem scores in this section

**Lab** (2/2) 100%

Lab

Problem Scores: 1/1 1/1

**Module 5:****Lesson 1: Neural Networks**

## Optimization-Based Methods

None

No problem scores in this section

### Lesson 2: Support Vector Machines (SVMs)

None

No problem scores in this section

**Lab** (2/2) 100%

Lab

Problem Scores: 1/1 1/1

---

## Module 6: Clustering and Recommenders

### Lesson 1: Clustering

None

No problem scores in this section

### Lesson 2: Recommenders

None

No problem scores in this section

**Lab** (3/3) 100%

Lab

Problem Scores: 2/2 1/1

---

## Final Exam and Survey

### Final Exam (16/18) 89%

Final Exam

Problem Scores:

1/1 1/1 1/1 0/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Post-Course Survey

None

No problem scores in this section



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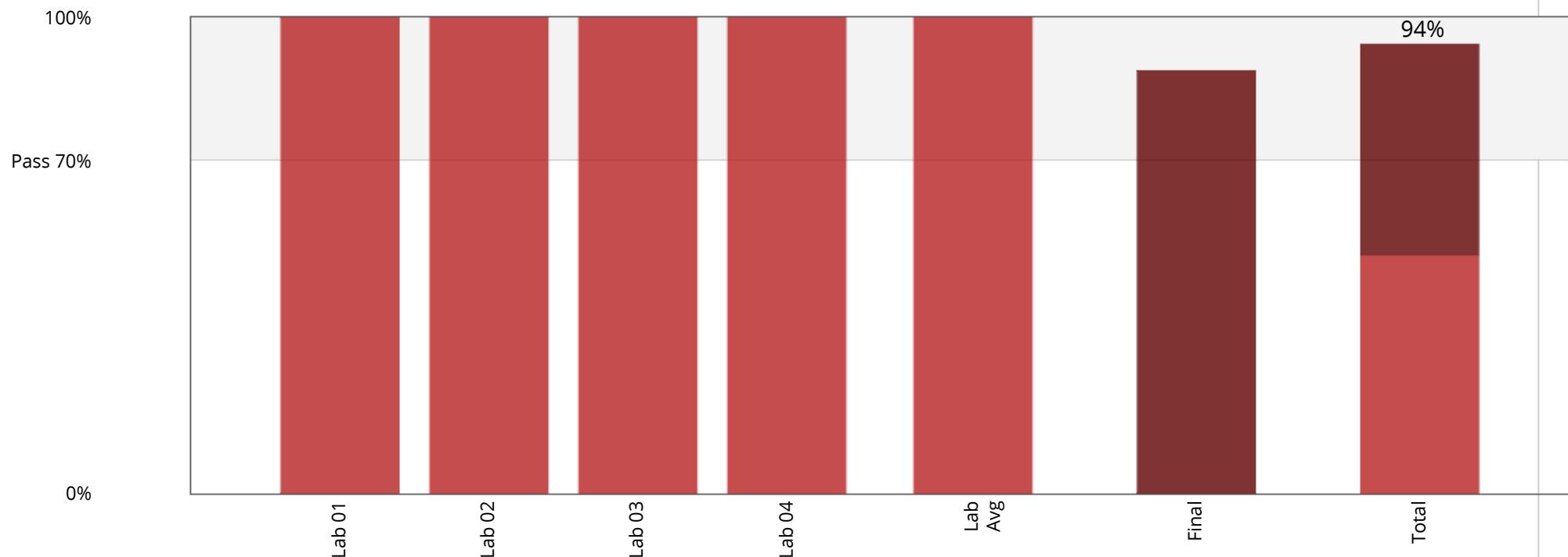




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Your enrollment: Audit track**

You are enrolled in the audit track for this course. The audit track does not include a certificate.

**Introduction**

## Before You Start

No problem scores in this section

## Module 1: Time Series and Forecasting

### Lesson 1: Introduction to Time Series

No problem scores in this section

### Lesson 2: Working with Time Series

No problem scores in this section

### Lesson 3: Forecasting in Context

No problem scores in this section

### Lab: Time Series and Forecasting (5/5) 100%

Lab

Problem Scores:    1/1    1/1    3/3

## Module 2: Spatial Data Analysis

**Lesson 1: Introduction to Spatial Data**

No problem scores in this section

**Lesson 2: Working with Spatial Data**

No problem scores in this section

**Lesson 3: Spatial Data in Context**

No problem scores in this section

**Lab: Spatial Data Analysis (2/2) 100%**

Lab

Problem Scores:    1/1    1/1

---

**Module 3: Text Analytics**

**Lesson 1: Introduction to Text Analytics**

No problem scores in this section

**Lesson 2: Working with Text**

No problem scores in this section

**Lesson 3: Text Analytics in Context**

No problem scores in this section

**Lab: Text Analytics (5/5) 100%**

Lab

Problem Scores:    1/1    1/1    3/3

---

**Module 4: Image Analysis**

**Lesson 1: Introduction to Image Analysis**

No problem scores in this section

**Lesson 2: Working with Images**

No problem scores in this section

**Lesson 3: Image Analysis In Context**

No problem scores in this section

**Lab: Image Analysis (1/1) 100%**

Lab

Problem Scores: 1/1

---

**Final Exam and Survey****Course Exam (8/9) 89%**

Final Exam

Problem Scores: 1/1    1/1    1/1    1/1    0/1    1/1    1/1    1/1  
1/1

**Post-Course Survey**

No problem scores in this section



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# HONOR CODE CERTIFICATE



Satya Nadella

Chief Executive Officer

*Microsoft Corporation*

Björn Rettig

Senior Director Technical Content

*Microsoft Corporation*

This is to certify that

**Sandipan Dey**

successfully completed and received a passing grade in

**DAT203x: Data Science and Machine Learning  
Essentials**

a course of study offered by Microsoft, an online learning initiative of Microsoft Corporation through edX.



HONOR CODE CERTIFICATE  
Issued November 1, 2015

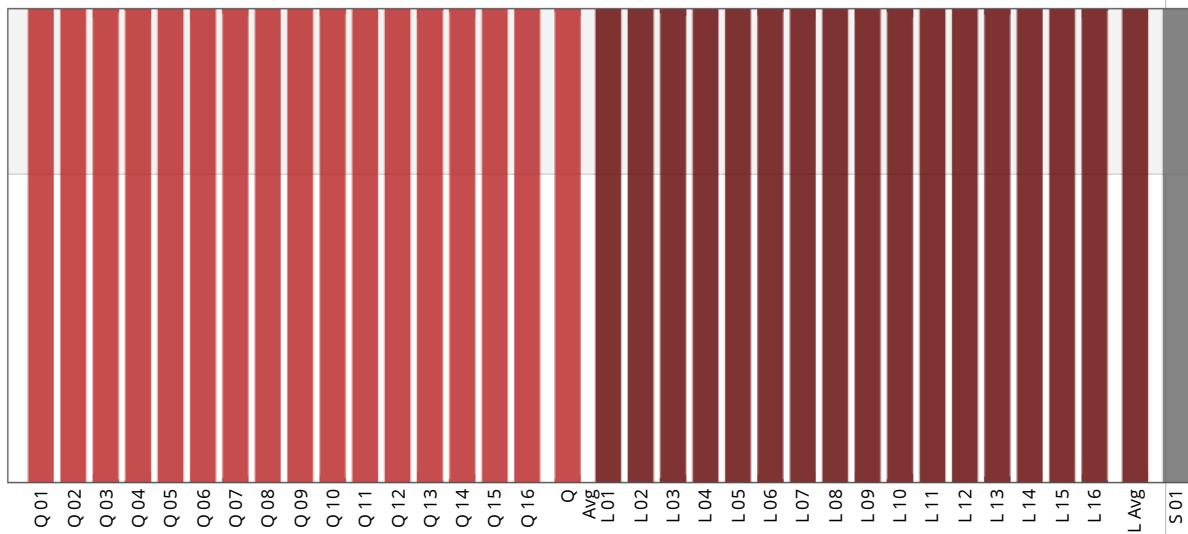
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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Congratulations, you qualified for a certificate!**

You can keep working for a higher grade, or request your certificate now.

[Request Certificate](#)**Start Here****Welcome to the Course!**

No problem scores in this section

**Pre-Course Survey!** (1/1) 100%  
Survey due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1

**1. Python Basics****Lecture: Hello Python!** (4/4) 100%  
Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1

**Lab: Hello Python!** (3.5/3.5) 100%  
Lab due Feb 16, 2016 at 23:30 UTC

Problem Scores: 3.5/3.5

**Lecture: Variables and Types** (3/3) 100%  
Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1

**Lab: Variables and Types** (6/6) 100%  
Lab due Feb 16, 2016 at 23:30 UTC

Problem Scores: 6/6

**Further Readings**

No problem scores in this section

**2. List - A Data****Lecture: Python Lists** (4/4) 100%

## Structure

Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1

**Lab: Python Lists** (3.5/3.5) 100%

Lab due Feb 16, 2016 at 23:30 UTC

Problem Scores: 3.5/3.5

**Lecture: Subsetting Lists** (4/4) 100%

Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1

**Lab: Subsetting Lists** (4.5/4.5) 100%

Lab due Feb 16, 2016 at 23:30 UTC

Problem Scores: 4.5/4.5

**Lecture: Manipulating Lists** (3/3) 100%

Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1

**Lab: Manipulating Lists** (3.5/3.5) 100%

Lab due Feb 16, 2016 at 23:30 UTC

Problem Scores: 3.5/3.5

## Further Readings

No problem scores in this section

---

## 3. Functions and Packages

**Lecture: Functions** (4/4) 100%

Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1

**Lab: Functions** (2.5/2.5) 100%

Lab due Feb 16, 2016 at 23:30 UTC

Problem Scores: 2.5/2.5

**Lecture: Methods** (3/3) 100%

Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1

**Lab: Methods** (3/3) 100%

Lab due Feb 16, 2016 at 23:30 UTC

Problem Scores: 3/3

**Lecture: Packages** (4/4) 100%

Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1

**Lab: Packages** (2.5/2.5) 100%

Lab due Feb 16, 2016 at 23:30 UTC

Problem Scores: 2.5/2.5

## Further Readings

No problem scores in this section

---

## 4. Numpy

**Lecture: Numpy** (4/4) 100%

Quiz due Feb 16, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1

**Lab: Numpy** (5.5/5.5) 100%*Lab due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 5.5/5.5

**Lecture: 2D Numpy Arrays** (3/3) 100%*Quiz due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1

**Lab: 2D Numpy Arrays** (4/4) 100%*Lab due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 4/4

**Lecture: Basic Statistics with Numpy** (3/3) 100%*Quiz due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1

**Lab: Basic Statistics with Numpy** (3/3) 100%*Lab due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 3/3

**Further Readings**

No problem scores in this section

---

**5. Plotting with Matplotlib****Lecture: Basic Plot with matplotlib** (4/4) 100%*Quiz due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1

**Lab: Basic Plots with matplotlib** (4.5/4.5) 100%*Lab due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 4.5/4.5

**Lecture: Histograms** (3/3) 100%*Quiz due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1

**Lab: Histograms** (4/4) 100%*Lab due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 4/4

**Lecture: Customization** (3/3) 100%*Quiz due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1

**Lab: Customization** (5.5/5.5) 100%*Lab due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 5.5/5.5

**Further Readings**

No problem scores in this section

---

**6. Control Flow and Pandas****Lecture: Boolean Logic and Control Flow** (6/6) 100%*Quiz due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

**Lab: Boolean Logic and Control Flow** (7/7) 100%  
*Lab due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 7/7

**Lecture: Pandas** (4/4) 100%  
*Quiz due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1

**Lab: Pandas** (5/5) 100%  
*Lab due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 5/5

### Further Readings

No problem scores in this section

## Course Wrap-up

### Course Wrap-up

No problem scores in this section

**Post-course Survey** (1/1) 100%  
*Survey due Feb 16, 2016 at 23:30 UTC*

Problem Scores: 1/1



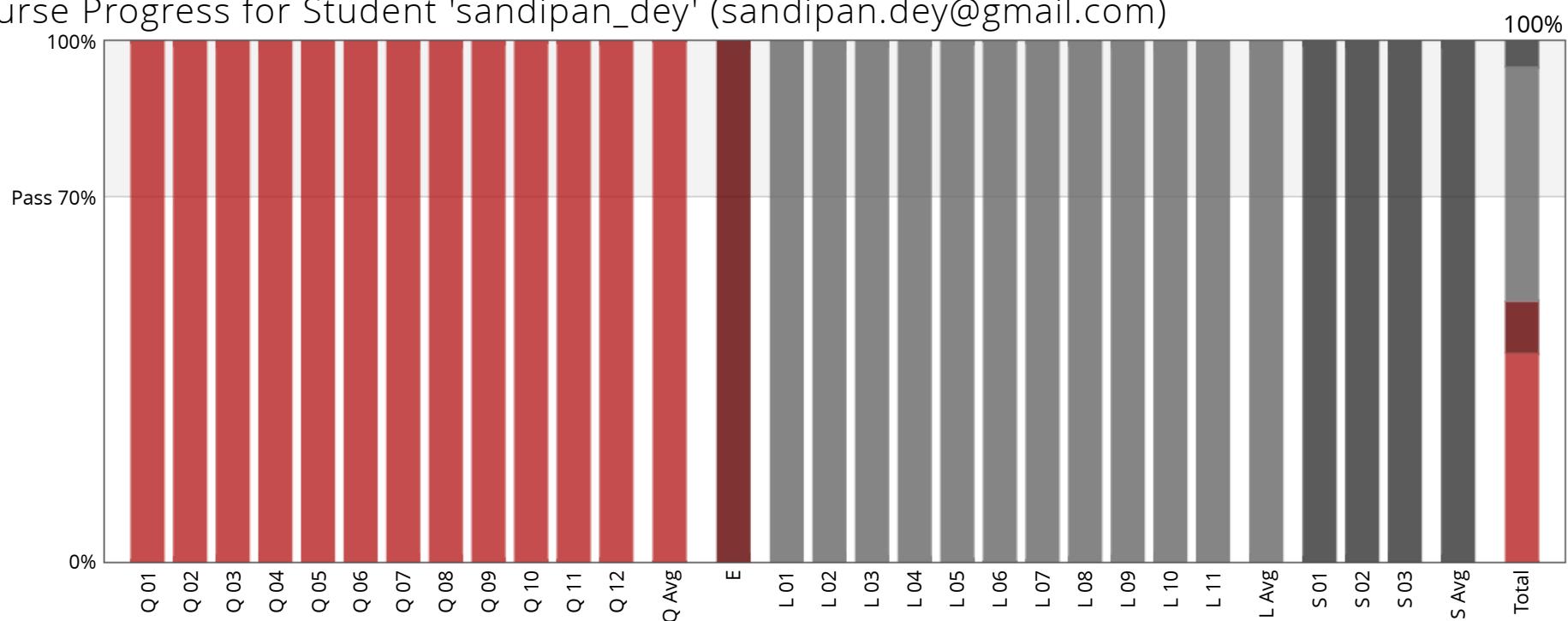
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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)



## 0. Start Here

## Welcome to the Course!

No problem scores in this section

## Pre-Course Survey (1/1) 100%

Survey due Jun 27, 2016 at 23:30 UTC

Problem Scores: 1/1

## Set up the Lab Environment

No problem scores in this section

## 1. Introduction

### Lecture (3/3) 100%

Exercise *due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1

### Knowledge Checks (5/5) 100%

Quiz *due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## 2. Functions and Data Structures

### Lecture

No problem scores in this section

### Knowledge Checks (10/10) 100%

Quiz *due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lab (6/6) 100%

Lab *due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

## 3. Loops and Flow Control

### Lecture

No problem scores in this section

### Knowledge Checks (5/5) 100%

Quiz due Jun 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1

**Lab** (7/7) 100%

Lab due Jun 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1 3/3

---

## 4. Working with Vectors and Matrices

### Lecture

No problem scores in this section

**Knowledge Checks** (5/5) 100%

Quiz due Jun 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1

**Lab** (5/5) 100%

Lab due Jun 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1

---

## 5. Reading in Data

### Lecture

No problem scores in this section

**Knowledge Checks** (4/4) 100%

Quiz due Jun 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1

**Lab** (6/6) 100%

Lab due Jun 27, 2016 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

---

## 6. Writing Data to Text Files

### Lecture

No problem scores in this section

### Knowledge Checks (5/5) 100%

*Quiz due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1

### Lab (4/4) 100%

*Lab due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 2/2

---

## 7. Reading Data from SQL Databases

### Lecture

No problem scores in this section

### Knowledge Checks (5/5) 100%

*Quiz due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1

### Lab (5/5) 100%

*Lab due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1

### Mid-course Survey (12/12) 100%

*Survey due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 3/3 6/6 3/3

---

## 8. Working with Data

### Lecture

No problem scores in this section

#### Knowledge Checks (5/5) 100%

*Quiz due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1

#### Lab (6/6) 100%

*Lab due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 2/2 1/1 1/1 2/2

---

## 9. Manipulating Data

### Lecture

No problem scores in this section

#### Knowledge Checks (5/5) 100%

*Quiz due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1

#### Lab (14/14) 100%

*Lab due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 2/2 1/1 2/2 2/2 2/2 2/2 2/2 1/1

---

## 10. Simulation

### Lecture

No problem scores in this section

**Knowledge Checks** (5/5) 100%*Quiz due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1

**Lab** (9/9) 100%*Lab due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 2/2 1/1 2/2 1/1 1/1 1/1 1/1

---

**11. Linear Models****Lecture**

No problem scores in this section

**Knowledge Checks** (3/3) 100%*Quiz due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1

**Lab** (8/8) 100%*Lab due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

---

**12. Graphics in R****Lecture**

No problem scores in this section

**Knowledge Checks** (5/5) 100%*Quiz due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1

**Lab** (6/6) 100%*Lab due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

**Course Wrap-up****Course Wrap-up**

No problem scores in this section

**Post-course Survey** (1/1) 100%*Survey due Jun 27, 2016 at 23:30 UTC*

Problem Scores: 1/1



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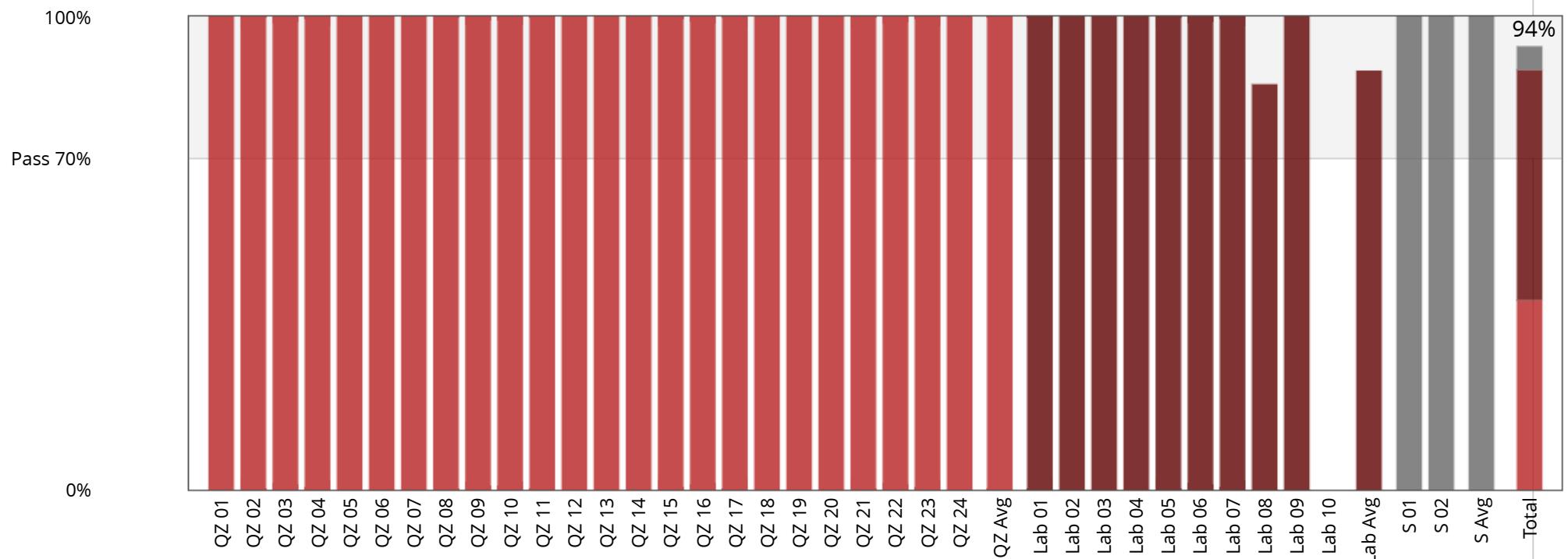




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Your enrollment: Audit track**

You are enrolled in the audit track for this course. The audit track does not include a certificate.

[Start Here](#)[Welcome to the Course!](#)

None

No problem scores in this section

**Pre-Course Survey** (1/1) 100%  
Survey

Problem Scores: 1/1

**Set up the Lab Environment**  
None

No problem scores in this section

---

## 1. The Big Picture

**Lecture: Data Science and Analysis** (2/2) 100%  
Quiz

Problem Scores: 1/1 1/1

**Lecture: Machine Learning** (1/1) 100%  
Quiz

Problem Scores: 1/1

**Lecture: The Possibilities** (3/3) 100%  
Quiz

Problem Scores: 1/1 1/1 1/1

**Dive Deeper**  
None

No problem scores in this section

---

## 2. Data And Features

### Lecture: Features Premiere (3/3) 100%

Quiz

Problem Scores: 1/1 1/1 1/1

### Lecture: Determining Features (3/3) 100%

Quiz

Problem Scores: 1/1 1/1 1/1

### Lecture: Manipulating Data (1/1) 100%

Quiz

Problem Scores: 1/1

### Lecture: Feature Representation (1/1) 100%

Quiz

Problem Scores: 1/1

### Lecture: Wrangling Data (1/1) 100%

Quiz

Problem Scores: 1/1

### Lab: Data and Features (13/13) 100%

Lab

Problem Scores: 1/1 3/3 3/3 3/3 3/3

### Dive Deeper

None

No problem scores in this section

### 3. Exploring Data

#### Lecture: Visualizations

None

No problem scores in this section

#### Lecture: Basic Plots (1/1) 100%

Quiz

Problem Scores: 1/1

#### Lecture: Higher Dimensionality (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

#### Lab: Visualizations (13/13) 100%

Lab

Problem Scores: 2/2 2/2 2/2 2/2 2/2 3/3

#### Dive Deeper

None

No problem scores in this section

### 4. Transforming Data

#### Lecture: Transformations

None

No problem scores in this section

#### Lecture: PCA (2/2) 100%

Quiz

Problem Scores: 1/1 1/1

**Lab: PCA (12/12) 100%**

Lab

Problem Scores: 3/3 5/5 2/2 2/2

**Lecture: Isomap (2/2) 100%**

Quiz

Problem Scores: 1/1 1/1

**Lab: Isomap (8/8) 100%**

Lab

Problem Scores: 4/4 2/2 2/2

**Lecture: Data Cleansing (1/1) 100%**

Quiz

Problem Scores: 1/1

**Dive Deeper**

None

No problem scores in this section

---

## 5. Data Modeling

**Lecture: Clustering (2/2) 100%**

Quiz

Problem Scores: 1/1 1/1

**Lab: Clustering (7/7) 100%**

Lab

Problem Scores: 2/2 1/1 3/3 1/1

**Lecture: Splitting Data (1/1) 100%**

Quiz

Problem Scores: 1/1

**Lecture: K-Nearest Neighbors (2/2) 100%**

Quiz

Problem Scores: 1/1 1/1

**Lab: K-Nearest Neighbors (4/4) 100%**

Lab

Problem Scores: 2/2 1/1 1/1

**Lecture: Regression (1/1) 100%**

Quiz

Problem Scores: 1/1

**Lab: Regression (4/4) 100%**

Lab

Problem Scores: 2/2 1/1 1/1

**Dive Deeper**

None

No problem scores in this section

---

**6. Data Modeling II****Lecture: SVC (2/2) 100%**

Quiz

Problem Scores: 1/1 1/1

**Lab: SVC (6/7) 86%**

Lab

Problem Scores: 1/1 1/1 1/1 1/1 0/1 1/1 1/1

**Lecture: Decision Trees (1/1) 100%**

Quiz

Problem Scores: 1/1

**Lab: Decision Trees (4/4) 100%**

Lab

Problem Scores: 1/1 1/1 1/1 1/1

**Lecture: Random Forest (2/2) 100%**

Quiz

Problem Scores: 1/1 1/1

**Lab: Random Forest (0/1)**

Lab

Problem Scores: 0/1

**Dive Deeper**

None

No problem scores in this section

---

**7. Evaluating Data****Lecture: Confusion (3/3) 100%**

Quiz

Problem Scores: 1/1 1/1 1/1

**Lecture: Cross Validation (2/2) 100%**

Quiz

Problem Scores: 1/1 1/1

**Lecture: Power Tuning (1/1) 100%**

Quiz

Problem Scores: 1/1

**Dive Deeper**

None

No problem scores in this section

---

**Course Wrap-up****Final Quiz (12/12) 100%**

Quiz

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

**Final Project**

None

No problem scores in this section

**Wrap-up**

None

No problem scores in this section

**Post-course Survey (1/1) 100%**

Survey

Problem Scores: 1/1



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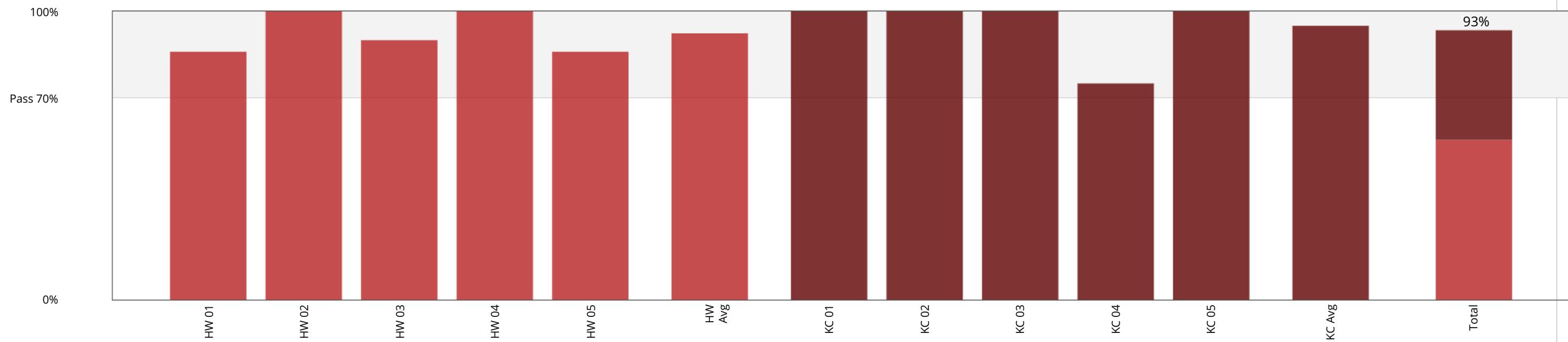
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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Welcome to course

#### Before You Start

No problem scores in this section

#### Welcome

No problem scores in this section

#### Pre-Course Survey

No problem scores in this section

### 1 | Introduction and Overview

### Introduction and Overview

No problem scores in this section

### What is Deep Learning

No problem scores in this section

### Environment Setup

No problem scores in this section

## 2 | Multi-class Classification using Logistic Regression

### Lectures

No problem scores in this section

### Knowledge Checks (10/10) 100%

Knowledge Checks

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Tutorials (6/7) 86%

Homework

Problem Scores: 0/1 1/1 1/1 1/1 1/1 1/1 1/1

## 3 | Multi-Layer Perceptron

### Lectures

No problem scores in this section

### Knowledge Checks (8/8) 100%

Knowledge Checks

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Tutorials (6/6) 100%

Homework

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

## 4 | Convolution Neural Network

Lectures

No problem scores in this section

Knowledge Checks (12/12) 100%

## Knowledge Checks

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

Tutorials (9/10) 90%

## Homework

Problem Scores: 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 2/2

## 5 | Recurrent Neural Network and Long Short Term Memory

Lectures

No problem scores in this section

Knowledge Checks (6/8) 75%

## Knowledge Checks

Problem Scores: 1/1 0/1 1/1 0/1 1/1 1/1 1/1 1/1

Tutorials (5/5) 100%

## Homework

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## 6 | Text Classification with RNN and LSTM

Lectures

No problem scores in this section

Knowledge Checks (5/5) 100%

## Knowledge Checks

Problem Scores: 1/1 1/1 1/1 1/1 1/1

Tutorials (6/7) 86%

## Homework

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1 1/1

## Wrap-up and Post-Course Survey

Course Wrap-up

No problem scores in this section

Post-Course Survey

No problem scores in this section



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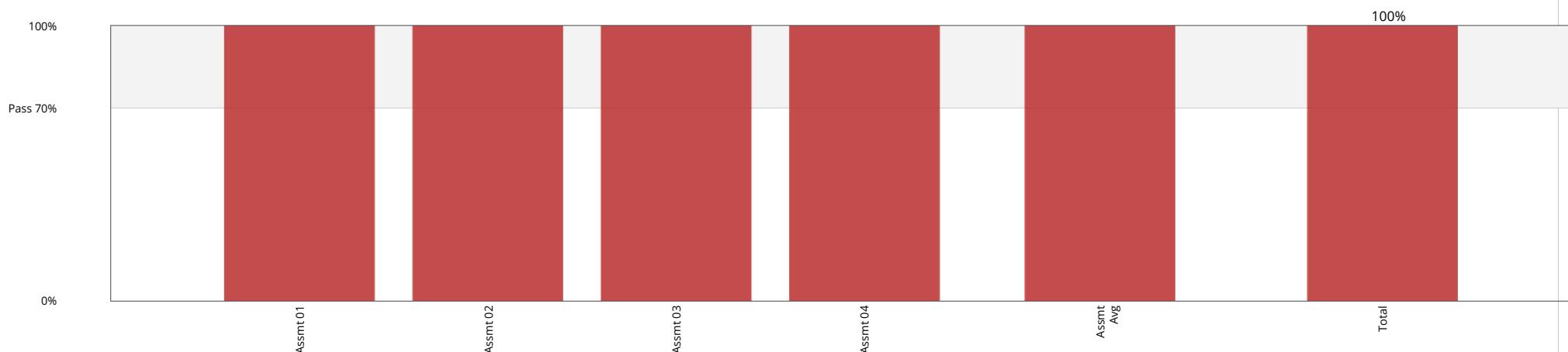
x



## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Before You Start

#### [Course Introduction](#) (0/1) 0%

Practice Scores: 0/1

### Equations, Graphs, and Functions

#### [Lesson 1: Algebra Fundamentals](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0

#### [Lesson 2: Quadratic Equations and Functions](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0

#### [Module Assessment](#) (7/7) 100%

##### Assessments

Problem Scores: 1/1 1/1 2/2 1/1 2/2

## Derivatives and Optimization

[Lesson 1: Differential Calculus Foundations](#)

Practice Scores: 0/0 0/0 0/0

[Lesson 2: Differentiation and Derivatives](#)

Practice Scores: 0/0 0/0 0/0 0/0

[Module Assessment](#) (6/6) 100%

## Assessments

Problem Scores: 1/1 1/1 1/1 2/2 1/1

## Vectors and Matrices

[Lesson 1: Vectors](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0

[Lesson 2: Matrices](#)

Practice Scores: 0/0 0/0 0/0 0/0

[Module Assessment](#) (5/5) 100%

## Assessments

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Statistics and Probability

[Lesson 1: Statistics Fundamentals](#)

Practice Scores: 0/0 0/0 0/0 0/0

[Lesson 2: Probability](#)

Practice Scores: 0/0 0/0 0/0

[Module Assessment](#) (7/7) 100%

## Assessments

Problem Scores: 3/3 1/1 1/1 1/1 1/1

## Before You Leave

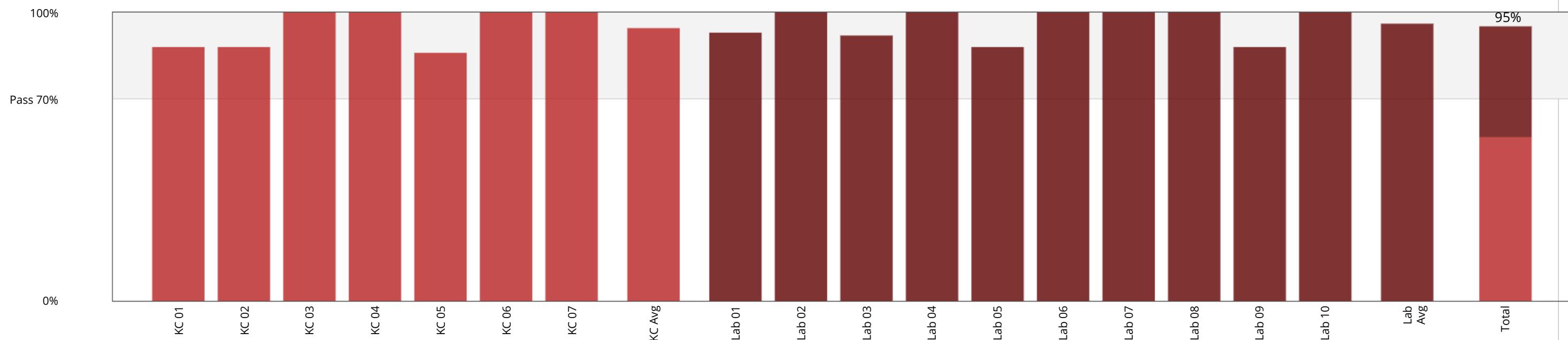
[Post-Course Survey](#)

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Welcome

#### Introduction

No problem scores in this section

#### Applications of Reinforcement Learning

No problem scores in this section

#### Overview of Modules and Labs

No problem scores in this section

#### Pre-course Survey

No problem scores in this section

### Introduction to Reinforcement Learning

## What is Reinforcement Learning

No problem scores in this section

## Comparisons

No problem scores in this section

## Elements of RL

No problem scores in this section

## Lab (13/14) 93%

Lab

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Knowledge Checks (7/8) 88%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1

## Bandits

### Bandits Framework

No problem scores in this section

### Regret Minimization

No problem scores in this section

### Bridge to Reinforcement Learning

No problem scores in this section

## Lab (16/16) 100%

Lab

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Knowledge Checks (7/8) 88%

Knowledge Check

Problem Scores: 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1

## The Reinforcement Learning Problem

## Agent and Environment Interface

No problem scores in this section

## Markov Decision Process

No problem scores in this section

### Lab (11/12) 92%

Lab

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1

### Knowledge Checks (8/8) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Dynamic Programming

### Basics of Dynamic Programming

No problem scores in this section

### DP Observations

No problem scores in this section

### Lab (4/4) 100%

Lab

Problem Scores: 1/1 1/1 1/1 1/1

### Knowledge Checks (7/7) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Temporal Difference Learning

## Policy Evaluation

No problem scores in this section

## Policy Optimization

No problem scores in this section

### Lab (15/17) 88%

Lab

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 0/1 1/1  
1/1

### Knowledge Checks (6/7) 86%

Knowledge Check

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1 1/1

## Function Approximation

### Why Use Function Approximation

No problem scores in this section

### Linear Function Approximation

No problem scores in this section

### Lab (3/3) 100%

Lab

Problem Scores: 1/1 1/1 1/1

### RL with Deep Neural Networks

No problem scores in this section

### Lab (6/6) 100%

Lab

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

### Extensions to Deep Q-Learning

No problem scores in this section

### Knowledge Checks (8/8) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Policy Gradient and Actor Critic

## Introduction to Policy Optimization

No problem scores in this section

## Likelihood Ratio Methods

No problem scores in this section

Lab (4/4) 100%

Lab

Problem Scores: 1/1 1/1 1/1 1/1

## Variance Reduction

No problem scores in this section

Lab (7/8) 88%

Lab

Problem Scores: 0/1 1/1 1/1 1/1 1/1 1/1 1/1

## Actor Critic

No problem scores in this section

Lab (2/2) 100%

Lab

Problem Scores: 1/1 1/1

## Knowledge Checks (5/5) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Post-Course Survey

### Post-Course Survey

No problem scores in this section

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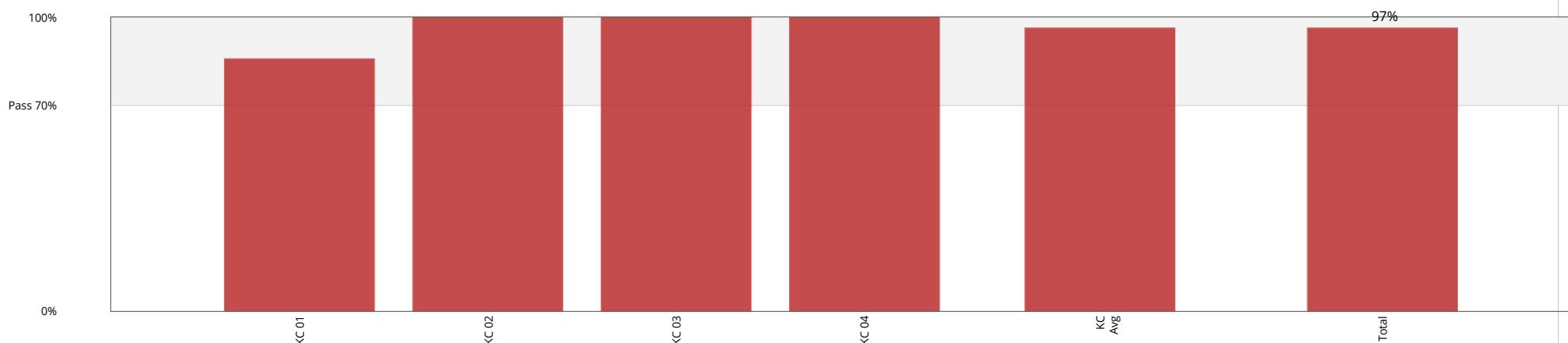
x



## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Before You Start

#### [Course Introduction](#)

Practice Scores: 0/0

### Equations, Graphs, and Functions

#### [Lesson 1: Algebra Fundamentals](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0

#### [Lesson 2: Quadratic Equations and Functions](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0

#### [Module Assessment](#) (6/7) 86%

Knowledge Check

Problem Scores: 0/1 1/1 2/2 1/1 2/2

## Derivatives and Optimization

[Lesson 1: Differential Calculus Foundations](#)

Practice Scores: 0/0 0/0 0/0

[Lesson 2: Differentiation and Derivatives](#)

Practice Scores: 0/0 0/0 0/0 0/0

[Module Assessment](#) (6/6) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 2/2 1/1

## Vectors and Matrices

[Lesson 1: Vectors](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0

[Lesson 2: Matrices](#)

Practice Scores: 0/0 0/0 0/0 0/0

[Module Assessment](#) (5/5) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1

## Statistics and Probability

[Lesson 1: Statistics Fundamentals](#)

Practice Scores: 0/0 0/0 0/0 0/0

[Lesson 2: Probability](#)

Practice Scores: 0/0 0/0 0/0

[Module Assessment](#) (7/7) 100%

Knowledge Check

Problem Scores: 3/3 1/1 1/1 1/1 1/1

## Before You Leave

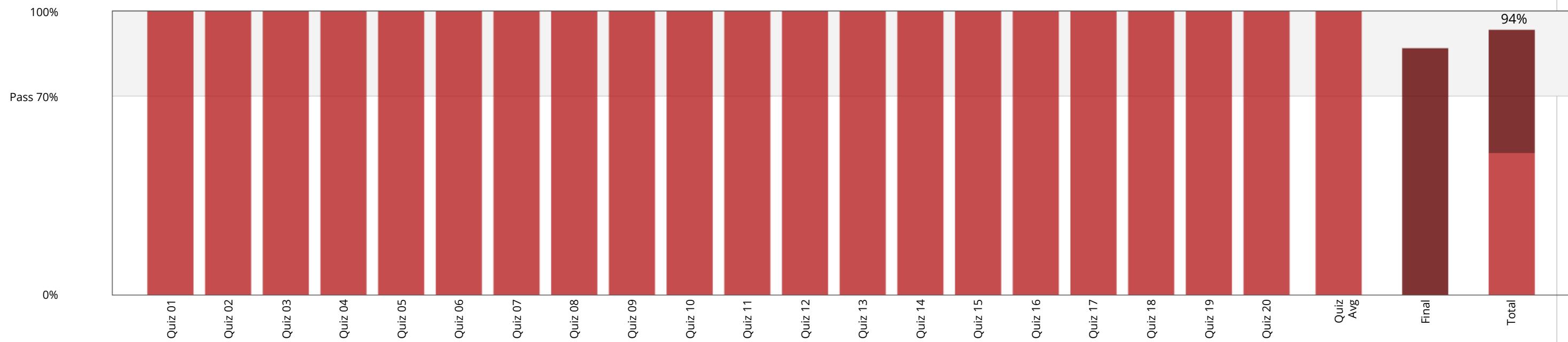
[Post-Course Survey](#)

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Welcome To The Course

#### Welcome

No problem scores in this section

#### About The Course

No problem scores in this section

#### Course Logistics

No problem scores in this section

### Introduction And Overview

## The Evolution of Computer Vision

No problem scores in this section

## Preparing For The Labs

No problem scores in this section

### Image Processing Basics (3/3) 100%

Knowledge Check

Problem Scores: 1/1    1/1    1/1

### Applications (2/2) 100%

Knowledge Check

Problem Scores: 1/1    1/1

## Image Features And Classical Methods

### Introduction (3/3) 100%

Knowledge Check

Problem Scores: 1/1    1/1    1/1

### Thresholding (5/5) 100%

Knowledge Check

Problem Scores: 1/1    1/1    1/1    1/1    1/1

### Clustering (5/5) 100%

Knowledge Check

Problem Scores: 1/1    1/1    1/1    1/1    1/1

### Region Growing (6/6) 100%

Knowledge Check

Problem Scores: 1/1    1/1    1/1    1/1    1/1    1/1

### Template Matching (2/2) 100%

Knowledge Check

Problem Scores: 1/1    1/1

### Edges And Corners (7/7) 100%

Knowledge Check

Problem Scores: 1/1    1/1    1/1    1/1    1/1    1/1    1/1

## Module Review

No problem scores in this section

## Object Classification And Detection

### Module Introduction (3/3) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1

### Viola-Jones (3/3) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1

### HOG (7/7) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Classical vs Deep (1/1) 100%

Knowledge Check

Problem Scores: 1/1

### Deep Learning (7/7) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Classifiers to Detectors

No problem scores in this section

### Object Proposals (2/2) 100%

Knowledge Check

Problem Scores: 1/1 1/1

### CNN Object Detectors (2/2) 100%

Knowledge Check

Problem Scores: 1/1 1/1

## Deep Segmentation And\_Transfer Learning

[Introduction](#) (1/1) 100%

Knowledge Check

Problem Scores: 1/1

[Super-Pixels And Conditional Random Fields](#) (2/2) 100%

Knowledge Check

Problem Scores: 1/1 1/1

[Fully Convolutional Approaches](#) (5/5) 100%

Knowledge Check

Problem Scores: 1/1 1/1 1/1 1/1 1/1

[Deep Segmenters](#) (2/2) 100%

Knowledge Check

Problem Scores: 1/1 1/1

[Transfer Learning](#) (2/2) 100%

Knowledge Check

Problem Scores: 1/1 1/1

## Final Exam

[Final Exam](#) (13/15) 87%

Final Exam

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 0/1 1/1 1/1

# HONOR CODE CERTIFICATE



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Bernard Gordon Professor of Medical Engineering  
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**John Guttag**

Dugald C. Jackson Professor of  
Computer Science and Electrical Engineering  
*Massachusetts Institute of Technology*

**Sanjay Sarma**

Director of Digital Learning  
*Massachusetts Institute of Technology*

# Sandipan Dey

successfully completed and received a passing grade in

## 6.00.1x: Introduction to Computer Science and Programming Using Python

a course of study offered by MITx, an online learning  
initiative of The Massachusetts Institute of Technology through edX.

**HONOR CODE CERTIFICATE**  
Issued October 31st, 2014

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Courseware

Updates &amp; News

Calendar

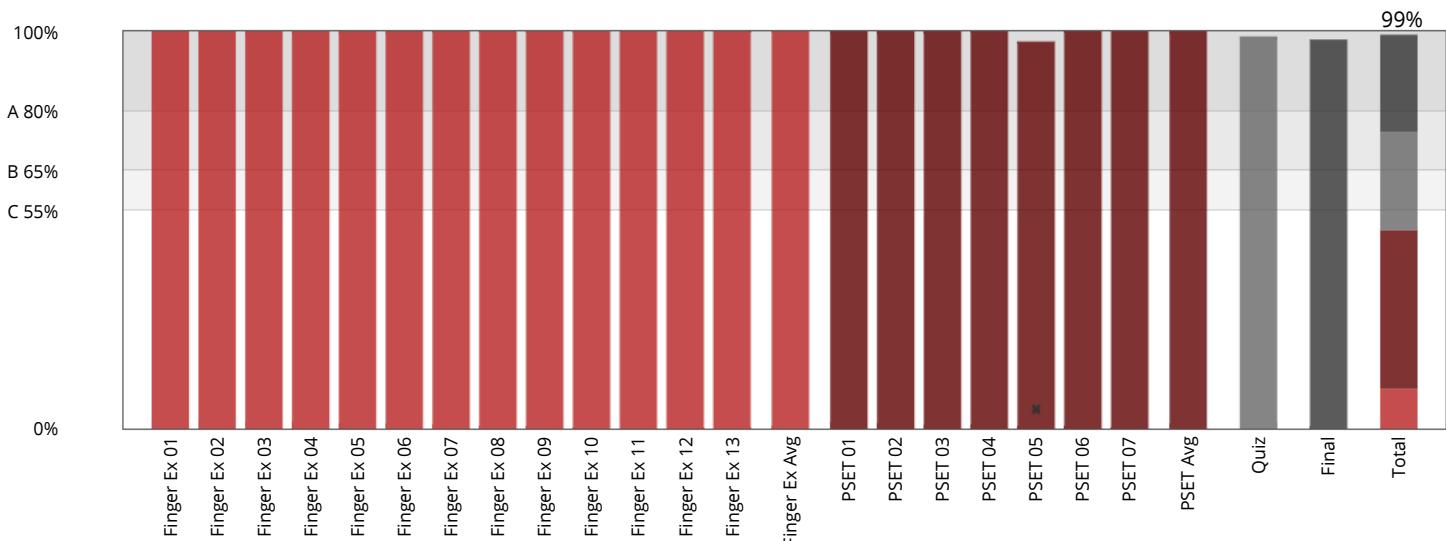
Wiki

Discussion

Progress

Help

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)



## Overview

[EdX Introduction](#) (0/6)

Practice Scores: 0/1 0/1 0/1 0/1 0/1 0/1

## Entrance Survey

[Important Preliminary Survey](#)

No problem scores in this section

## Week 1

[Lecture 1 - Introduction to Computation - Time 33:07](#) (20/20) 100%

Lecture Sequence

Problem Scores: 5/5 5/5 5/5 5/5

[Problem Set 0](#)

Problem Set

No problem scores in this section

[Lecture 2 - Core Elements of Programs - Time 47:06](#) (51/51) 100%

Lecture Sequence

Problem Scores: 5/5 5/5 5/5 5/5 5/5 5/5 5/5 1/1 5/5 5/5 5/5

## Week 2

[Lecture 3 - Simple Algorithms - Time 56:38](#) (49/49) 100%

Lecture Sequence

Problem Scores: 5/5 2/2 2/2 3/3 5/5 5/5 2/2 2/2 3/3 5/5 5/5 5/5

[Lecture 4 - Functions - Time 56:51](#) (60/60) 100%

Lecture Sequence

Problem Scores: 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5

[Problem Set 1](#) (40/40) 100%

Problem Set due Sep 08, 2014 at 23:30 UTC

Problem Scores: 10/10 15/15 15/15

### Problem Set 2 (50/50) 100%

Problem Set due Sep 11, 2014 at 11:30 UTC

Problem Scores: 10/10 15/15 25/25

## Week 3

### Lecture 5 - Recursion - Time 55:06 (50/50) 100%

Lecture Sequence

Problem Scores: 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5

### Lecture 6 - Objects - Time 46:20 (55/55) 100%

Lecture Sequence

Problem Scores: 5/5 5/5 5/5 5/5 5/5 5/5 1/1 2/2 2/2 5/5 5/5 5/5

### Problem Set 3 (75/75) 100%

Problem Set due Sep 18, 2014 at 23:30 UTC

Problem Scores: 25/25 5/5 5/5 5/5 15/15 20/20

## Week 4

### Lecture 7 - Debugging - Time 48:59 (40/40) 100%

Lecture Sequence

Problem Scores: 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5

### Lecture 8 - Assertions and Exceptions - Time 34:58 (27/27) 100%

Lecture Sequence

Problem Scores: 5/5 11/11 3/3 8/8

### Problem Set 4 (100/100) 100%

Problem Set due Sep 25, 2014 at 23:30 UTC

Problem Scores: 10/10 10/10 10/10 5/5 15/15 10/10 15/15 10/10 15/15

## Quiz

### Quiz (77/78) 99%

Quiz due Sep 29, 2014 at 23:30 UTC

Problem Scores:

1/1 2/2 2/2 10/10  
10/10 10/10 10/10 5/5 5/5 5/5 3/3 0/0

### Quiz Code Graders (0/7)

Practice Scores: 0/1 0/1 0/1 0/1 0/1 0/1 0/1

## Week 5

### Lecture 9 - Efficiency and Orders of Growth - Time 41:14 (40/40) 100%

Lecture Sequence

Problem Scores: 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5

### Lecture 10 - Memory and Search - Time 54:24 (40/40) 100%

Lecture Sequence

Problem Scores: 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5

### Problem Set 5 (38/39) 97%

Problem Set due Oct 08, 2014 at 23:30 UTC

Problem Scores:

1/1 2/2 2/2 2/2 2/2 2/2 5/5 1/1 1/1

0/1 1/1



#### Practice - Problem Set 4 (0/9)

Practice Scores: 0/1 0/1 0/1 0/1 0/1 0/1 0/1 0/1

#### Practice - Problem Set 6 (0/5)

Practice Scores: 0/1 0/1 0/1 0/1 0/1

#### Practice - Problem Set 7 (0/6)

Practice Scores: 0/1 0/1 0/1 0/1 0/1 0/1



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**Sanjay Sarma**

Director of Digital Learning  
*Massachusetts Institute of Technology*

# Sandipan Dey

successfully completed and received a passing grade in

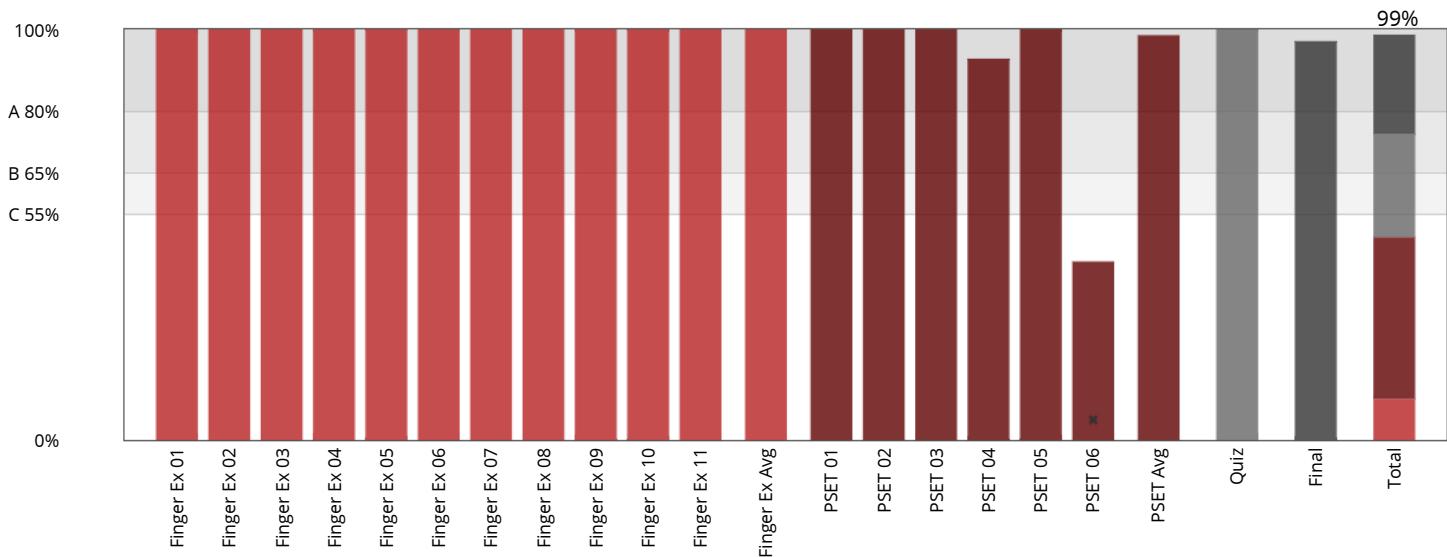
## 6.00.2x: Introduction to Computational Thinking and Data Science

a course of study offered by MITx, an online learning  
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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)



Help

## Overview

[EdX Introduction](#) (0/6)

Practice Scores: 0/1 0/1 0/1 0/1 0/1 0/1

## Entrance Survey

[Important Preliminary Survey](#)

No problem scores in this section

## Week 1

[Welcome!](#)

No problem scores in this section

[Lecture 1 - Plotting - Time 38:03](#) (14/14) 100%

Lecture Sequence

Problem Scores: 1/1 6/6 3/3 4/4

[Lecture 2 - Simulations and Random Walks - Time 38:27](#) (36/36) 100%

Lecture Sequence

Problem Scores: 6/6 3/3 5/5 5/5 5/5 3/3 3/3 2/2 3/3 1/1

[Problem Set 1](#) (6/6) 100%

Problem Set due Nov 04, 2014 at 23:30 UTC

Problem Scores: 1/1 1/1 1/1 3/3

## Week 2

[Lecture 3 - Probability and Hashing - Time 31:01](#) (40/40) 100%

Lecture Sequence

Problem Scores: 10/10 13/13 5/5 5/5 7/7

[Lecture 4 - Stochastic Programming and Statistical Thinking - Time 31:46](#) (20/20) 100%

Lecture Sequence





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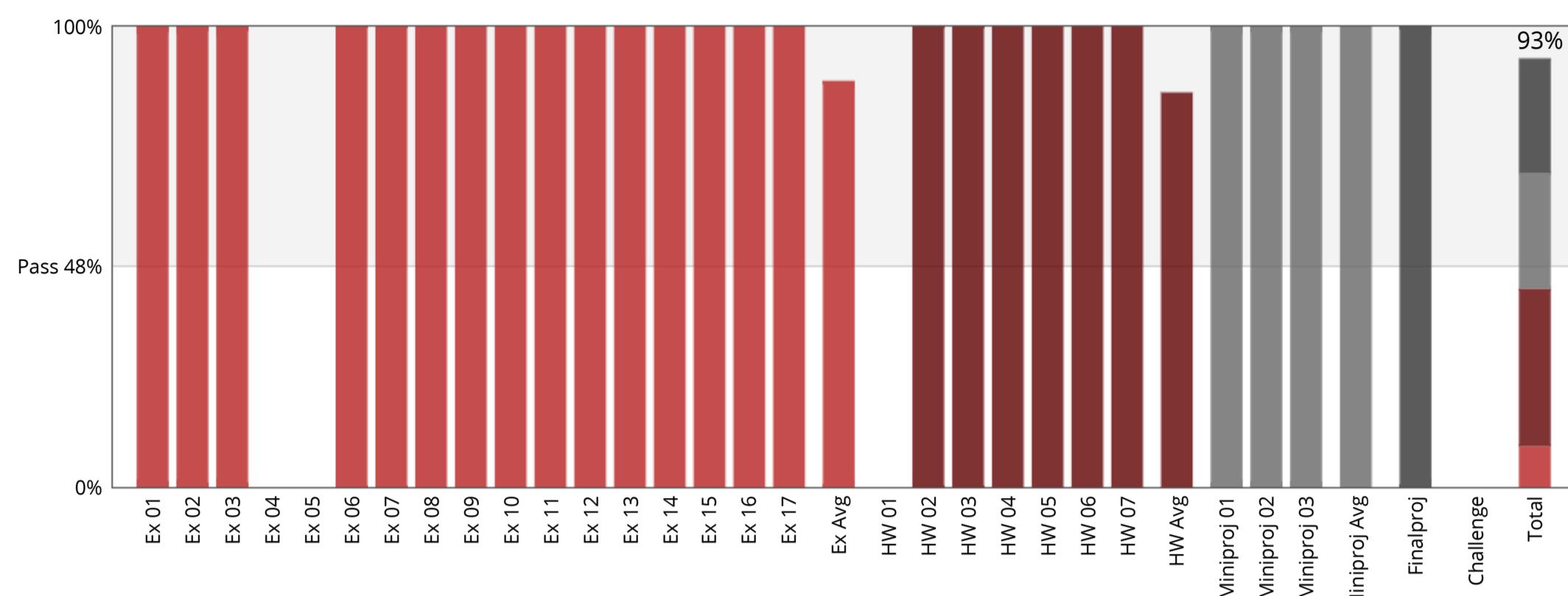
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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Introduction

#### Course Overview

No problem scores in this section

#### Prerequisites

No problem scores in this section

#### MITx Entrance Survey

No problem scores in this section

#### Syllabus

No problem scores in this section

### Part 1: Probability and Inference

**Week 1: Introduction to Probability (4/4) 100%***Exercises due Sep 22, 2016 02:30 IST*

Problem Scores: 4/4

**Week 1: Probability Spaces and Events (20/20) 100%***Exercises due Sep 22, 2016 02:30 IST*

Problem Scores: 6/6 3/3 5/5 3/3 3/3

**Week 1: Random Variables (14/14) 100%***Exercises due Sep 22, 2016 02:30 IST*

Problem Scores: 4/4 4/4 3/3 3/3

**Week 2: Jointly Distributed Random Variables (0/28)***Exercises due Sep 29, 2016 02:30 IST*

Problem Scores: 0/5 0/4 0/4 0/15

**Week 2: Conditioning on Events (0/15)***Exercises due Sep 29, 2016 02:30 IST*

Problem Scores: 0/4 0/3 0/8

**Week 2: Homework 1 (0/20)***Homework due Sep 29, 2016 02:30 IST*

Problem Scores: 0/10 0/10

**Week 3: Inference with Bayes' Theorem for Random Variables (9/9) 100%***Exercises due Oct 6, 2016 02:30 IST*

Problem Scores: 4/4 4/4 1/1

**Week 3: Independence Structure (15/15) 100%***Exercises due Oct 6, 2016 02:30 IST*

Problem Scores: 5/5 3/3 4/4 2/2 1/1

**Week 3: Homework 2 (10/10) 100%***Homework due Oct 6, 2016 02:30 IST*

Problem Scores: 10/10

**Notation Summary Up Through Week 3**

No problem scores in this section

**Weeks 3 and 4: Mini-project on Movie Recommendations (100/100) 100%**

100%

*Mini-projects due Oct 21, 2016 02:30 IST*

Problem Scores: 100/100

**Week 4: Decisions and Expectations (25/25) 100%***Exercises due Oct 13, 2016 02:30 IST*

Problem Scores: 2/2 7/7 7/7 9/9

**Week 4: Measuring Randomness (16/16) 100%***Exercises due Oct 13, 2016 02:30 IST*

Problem Scores: 3/3 7/7 4/4 2/2

**Week 4: Towards Infinity in Modeling Uncertainty (4/4) 100%***Exercises due Oct 13, 2016 02:30 IST*

Problem Scores: 4/4

**Week 4: Homework 3 (20/20) 100%***Homework due Oct 13, 2016 02:30 IST*

Problem Scores: 10/10 10/10

**Week 5: Introduction to Part 2 on Inference in Graphical Models**

No problem scores in this section

**Week 5: Efficiency in Computer Programs (7/7) 100%**

Exercises due Oct 20, 2016 02:30 IST

Problem Scores: 4/4 3/3

**Week 5: Graphical Models (12/12) 100%**

Exercises due Oct 20, 2016 02:30 IST

Problem Scores: 5/5 7/7

**Week 5: Homework 4 (25/25) 100%**

Homework due Oct 21, 2016 02:30 IST

Problem Scores: 10/10 10/10 5/5

**Week 6: Inference in Graphical Models - Marginalization (21/21) 100%**

Exercises due Oct 27, 2016 02:30 IST

Problem Scores: 3/3 7/7 11/11

**Week 6: Special Case - Marginalization in Hidden Markov Models**

Exercises due Oct 27, 2016 02:30 IST

No problem scores in this section

**Week 6: Homework 5 (15/15) 100%**

Homework due Oct 27, 2016 02:30 IST

Problem Scores: 5/5 10/10

**Weeks 6 and 7: Mini-project on Robot Localization (100/100) 100%**

Mini-projects due Nov 10, 2016 03:30 IST

Problem Scores: 100/100

**Week 7: Inference with Graphical Models - Most Probable Configuration (10/10) 100%**

Exercises due Nov 3, 2016 02:30 IST

Problem Scores: 4/4 1/1 5/5

**Week 7: Special Case - MAP Estimation in Hidden Markov Models**

No problem scores in this section

**Part 3: Learning Probabilistic Models****Week 8: Introduction to Learning Probabilistic Models**

No problem scores in this section

**Week 8: Introduction to Parameter Learning - Maximum Likelihood and MAP Estimation (5/5) 100%**

Exercises due Nov 10, 2016 03:30 IST

Problem Scores: 5/5

**Week 8: Homework 6 (20/20) 100%**

Homework due Nov 10, 2016 03:30 IST

Problem Scores: 10/10 10/10

**Week 9: Parameter Learning - Naive Bayes Classification**

No problem scores in this section

**Week 9: Mini-project on Email Spam Detection (100/100) 100%**

Mini-projects due Nov 17, 2016 03:30 IST

Problem Scores: 90/90 10/10

**Week 10: Parameter Learning - Finite Random Variables and Trees (10/10) 100%**

Exercises due Nov 24, 2016 03:30 IST

Problem Scores: 10/10

**Week 10: Structure Learning - Trees (1/1) 100%**

Exercises due Nov 24, 2016 03:30 IST

Problem Scores: 1/1

**Week 10: Homework 7 (20/20) 100%**

Homework due Nov 24, 2016 03:30 IST

Problem Scores: 10/10 10/10

**Final Project****Weeks 11 and 12: Final Project - Coconut Oil Price Movements**

(100/100) 100%

Final Project due Dec 6, 2016 03:30 IST

Problem Scores: 100/100

**Week 12: Challenge - Forecasting Coconut Oil Price Movements**

(0/100)

Challenge due Jan 1, 2017 03:30 IST

Problem Scores: 0/100

**Epilogue****What's Next?**

No problem scores in this section

**MITx Exit Survey**

No problem scores in this section

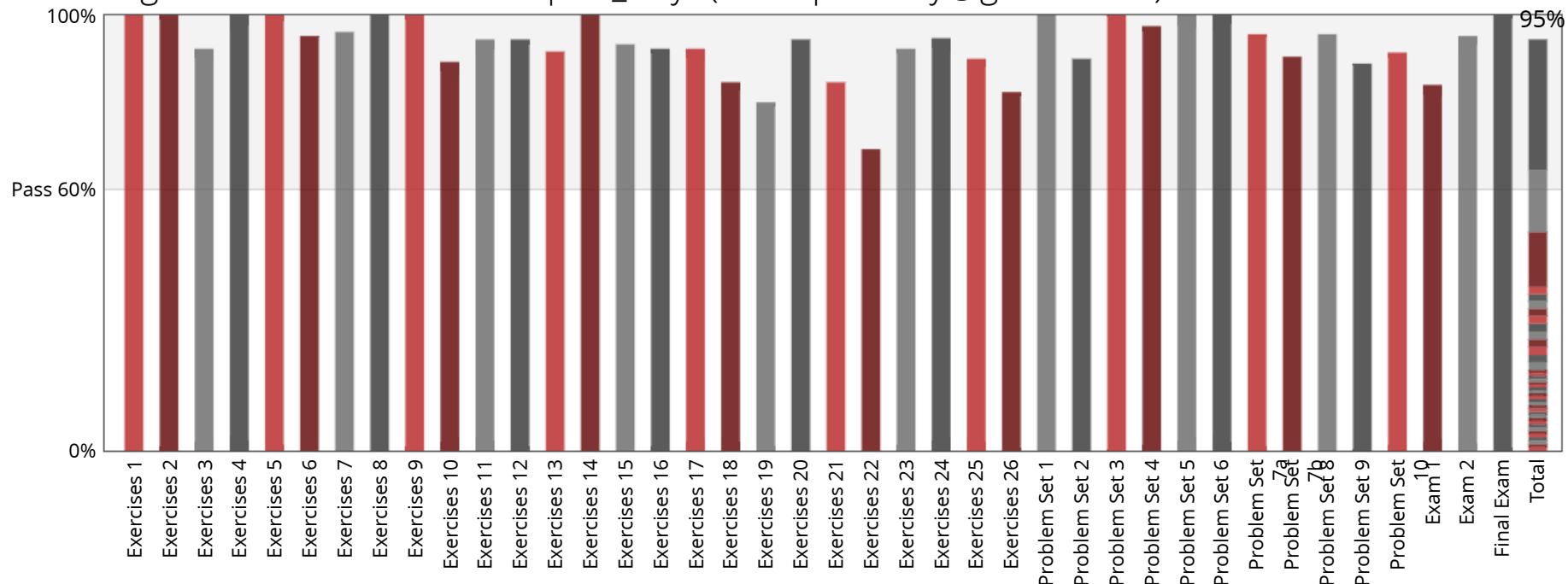


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## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)



Unit 0: Overview

Lec. 0: Course overview

No problem scores in this section

Course introduction, objectives, and study guide

No problem scores in this section

Syllabus, calendar, and grading policy

No problem scores in this section

### edX Tutorial

No problem scores in this section

### Discussion forum and collaboration guidelines

No problem scores in this section

### Homework mechanics and standard notation

No problem scores in this section

### Textbook information

No problem scores in this section

---

## Entrance Survey

### Important Preliminary Survey

No problem scores in this section

---

## Unit 1: Probability models and axioms

### Lec. 1: Probability models and axioms (19/19) 100%

Exercises 1 due Feb 10, 2016 at 23:59 UTC

Problem Scores: 2/2 1/1 1/1 4/4 2/2 2/2 3/3 1/1 1/1 2/2

Mathematical background: Sets; sequences, limits, and series; (un)countable sets.

No problem scores in this section

### Solved problems

No problem scores in this section

**Problem Set 1** (21/21) 100%

Problem Set 1 due Feb 10, 2016 at 23:59 UTC

Problem Scores: 5/5 3/3 4/4 3/3 6/6

---

**Unit 2: Conditioning and independence****Unit overview**

No problem scores in this section

**Lec. 2: Conditioning and Bayes' rule** (14/14) 100%

Exercises 2 due Feb 17, 2016 at 23:59 UTC

Problem Scores: 2/2 2/2 4/4 2/2 4/4

**Lec. 3: Independence** (12/13) 92%

Exercises 3 due Feb 17, 2016 at 23:59 UTC

Problem Scores: 1/1 1/1 2/2 1/1 2/2 1/2 4/4

**Solved problems**

No problem scores in this section

**Problem Set 2** (18/20) 90%

Problem Set 2 due Feb 17, 2016 at 23:59 UTC

Problem Scores: 3/4 4/4 5/6 6/6

---

**Unit 3: Counting****Lec. 4: Counting** (14/14) 100%

Exercises 4 due Feb 24, 2016 at 23:59 UTC

Problem Scores: 3/3 2/2 2/2 2/2 2/2 3/3

## Solved problems

No problem scores in this section

### Problem Set 3 (17/17) 100%

Problem Set 3 due Feb 24, 2016 at 23:59 UTC

Problem Scores: 2/2 4/4 2/2 4/4 5/5

## Unit 4: Discrete random variables

### Unit overview

No problem scores in this section

### Lec. 5: Probability mass functions and expectations (21/21) 100%

Exercises 5 due Mar 02, 2016 at 23:59 UTC

Problem Scores: 2/2 2/2 2/2 2/2 2/2 2/2 1/1 3/3 2/2 3/3

### Lec. 6: Variance; Conditioning on an event; Multiple r.v.'s (20/21) 95%

Exercises 6 due Mar 02, 2016 at 23:59 UTC

Problem Scores: 1/1 1/1 2/2 2/2 2/2 2/2 2/2 5/6 1/1 2/2

### Lec. 7: Conditioning on a random variable; Independence of r.v.'s (25/26) 96%

Exercises 7 due Mar 02, 2016 at 23:59 UTC

Problem Scores: 7/7 5/6 5/5 1/1 2/2 3/3 2/2

## Solved problems

No problem scores in this section

## Additional theoretical material

No problem scores in this section

**Problem Set 4** (39/40) 98%*Problem Set 4 due Mar 02, 2016 at 23:59 UTC*

Problem Scores: 9/9   9/9   6/6   5/5   6/6   4/5

**Unit summary**

No problem scores in this section

---

**Exam 1****Exam 1** (21/25) 84%*Exam 1 due Mar 09, 2016 at 23:59 UTC*

Problem Scores: 4/4   4/5   1/2   3/3   2/2   2/4   5/5

---

**Unit 5: Continuous random variables****Unit overview**

No problem scores in this section

**Lec. 8: Probability density functions** (17/17) 100%*Exercises 8 due Mar 18, 2016 at 23:59 UTC*

Problem Scores: 4/4   2/2   3/3   2/2   2/2   1/1   3/3

**Lec. 9: Conditioning on an event; Multiple r.v.'s** (26/26) 100%*Exercises 9 due Mar 18, 2016 at 23:59 UTC*

Problem Scores: 1/1   3/3   2/2   1/1   2/2   8/8   1/1   5/5   3/3

**Lec. 10: Conditioning on a random variable; Independence; Bayes' rule** (25/28) 89%*Exercises 10 due Mar 18, 2016 at 23:59 UTC*

Problem Scores: 2/2   2/2   5/8   1/1   3/3   2/2   3/3   4/4   1/1   1/1   1/1

## Standard normal table

No problem scores in this section

## Solved problems

No problem scores in this section

### Problem Set 5 (32/32) 100%

Problem Set 5 due Mar 18, 2016 at 23:59 UTC

Problem Scores: 5/5 4/4 4/4 7/7 7/7 3/3 2/2

## Unit summary

No problem scores in this section

## Unit 6: Further topics on random variables

### Unit overview

No problem scores in this section

### Lec. 11: Derived distributions (17/18) 94%

Exercises 11 due Mar 30, 2016 at 23:59 UTC

Problem Scores: 2/2 2/2 1/2 6/6 4/4 2/2

### Lec. 12: Sums of independent r.v.'s; Covariance and correlation (17/18) 94%

Exercises 12 due Mar 30, 2016 at 23:59 UTC

Problem Scores: 1/1 2/2 3/3 1/1 3/3 0/1 1/1 6/6

### Lec. 13: Conditional expectation and variance revisited; Sum of a random number of independent r.v.'s (22/24) 92%

Exercises 13 due Mar 30, 2016 at 23:59 UTC

Problem Scores: 1/1 7/8 1/1 3/3 4/5 4/4 2/2

## Solved problems

No problem scores in this section

## Additional theoretical material

No problem scores in this section

### Problem Set 6 (33/33) 100%

Problem Set 6 due Mar 30, 2016 at 23:59 UTC

Problem Scores: 6/6    3/3    3/3    6/6    5/5    6/6    4/4

## Unit summary

No problem scores in this section

---

## Unit 7: Bayesian inference

### Unit overview

No problem scores in this section

### Lec. 14: Introduction to Bayesian inference (23/23) 100%

Exercises 14 due Apr 06, 2016 at 23:59 UTC

Problem Scores: 4/4    3/3    5/5    2/2    4/4    3/3    2/2

### Lec. 15: Linear models with normal noise (14/15) 93%

Exercises 15 due Apr 06, 2016 at 23:59 UTC

Problem Scores: 2/2    3/4    2/2    1/1    1/1    1/1    4/4

### Problem Set 7a (22/23) 96%

Problem Set 7a due Apr 06, 2016 at 23:59 UTC

Problem Scores: 3/3    5/6    5/5    5/5    4/4

**Lec. 16: Least mean squares (LMS) estimation (12/13) 92%***Exercises 16 due Apr 13, 2016 at 23:59 UTC*

Problem Scores: 1/1   3/3   1/1   4/4   2/2   1/2

**Lec. 17: Linear least mean squares (LLMS) estimation (12/13) 92%***Exercises 17 due Apr 13, 2016 at 23:59 UTC*

Problem Scores: 2/2   2/2   2/2   1/2   1/1   3/3   1/1

**Problem Set 7b (19/21) 90%***Problem Set 7b due Apr 13, 2016 at 23:59 UTC*

Problem Scores: 3/3   3/3   3/3   3/3   4/4   3/5

**Solved problems**

No problem scores in this section

**Additional theoretical material**

No problem scores in this section

**Unit summary**

No problem scores in this section

---

**Exam 2****Exam 2 (20/21) 95%***Exam 2 due Apr 20, 2016 at 23:59 UTC*Problem Scores: 3/3   3/3   4/4   2/3   4/4   4/4

---

## Unit 8: Limit theorems and classical statistics

### Unit overview

No problem scores in this section

#### Lec. 18: Inequalities, convergence, and the Weak Law of Large Numbers (11/13) 85%

Exercises 18 due Apr 27, 2016 at 23:59 UTC

Problem Scores: 1/1   1/1   2/2   2/2   4/4   1/3

#### Lec. 19: The Central Limit Theorem (CLT) (12/15) 80%

Exercises 19 due Apr 27, 2016 at 23:59 UTC

Problem Scores: 2/2   1/4   6/6   3/3

#### Lec. 20: An introduction to classical statistics (17/18) 94%

Exercises 20 due Apr 27, 2016 at 23:59 UTC

Problem Scores: 4/4   2/2   4/4   1/2   2/2   3/3   1/1

### Solved problems

No problem scores in this section

### Additional theoretical material

No problem scores in this section

#### Problem Set 8 (22/23) 96%

Problem Set 8 due Apr 27, 2016 at 23:59 UTC

Problem Scores: 6/6   3/3   5/5   3/3   2/2   3/4

### Unit summary

No problem scores in this section

## Unit 9: Bernoulli and Poisson processes

### Unit overview

No problem scores in this section

#### Lec. 21: The Bernoulli process (11/13) 85%

Exercises 21 due May 11, 2016 at 23:59 UTC

Problem Scores: 3/4 1/1 3/3 1/1 1/1 1/2 1/1

#### Lec. 22: The Poisson process (9/13) 69%

Exercises 22 due May 11, 2016 at 23:59 UTC

Problem Scores: 1/1 1/3 1/1 4/4 1/1 0/2 1/1

#### Lec. 23: More on the Poisson process (12/13) 92%

Exercises 23 due May 11, 2016 at 23:59 UTC

Problem Scores: 0/1 2/2 2/2 1/1 1/1 1/1 1/1 1/1 2/2 1/1

### Solved problems

No problem scores in this section

### Additional theoretical material

No problem scores in this section

#### Problem Set 9 (32/36) 89%

Problem Set 9 due May 11, 2016 at 23:59 UTC

Problem Scores: 5/6 4/5 5/5 7/7 8/8 0/2 3/3

### Unit summary

No problem scores in this section

## Unit 10: Markov chains

### Unit overview

No problem scores in this section

#### Lec. 24: Finite-state Markov chains (18/19) 95%

Exercises 24 due May 18, 2016 at 23:59 UTC

Problem Scores: 2/2 2/3 3/3 2/2 5/5 4/4

#### Lec. 25: Steady-state behavior of Markov chains (18/20) 90%

Exercises 25 due May 18, 2016 at 23:59 UTC

Problem Scores: 3/3 4/4 1/2 4/4 2/2 4/5

#### Lec. 26: Absorption probabilities and expected time to absorption (14/17) 82%

Exercises 26 due May 18, 2016 at 23:59 UTC

Problem Scores: 0/3 2/2 2/2 2/2 3/3 5/5

### Solved problems

No problem scores in this section

#### Problem Set 10 (32/35) 91%

Problem Set 10 due May 18, 2016 at 23:59 UTC

Problem Scores: 4/6 6/6 6/7 10/10 6/6

---

## Exit Survey

### Important Exit Survey

No problem scores in this section

---

## Final Exam

### Final Exam (21/21) 100%

Final Exam due May 24, 2016 at 23:59 UTC

Problem Scores: 3/3 2/2 2/2 3/3 6/6 5/5



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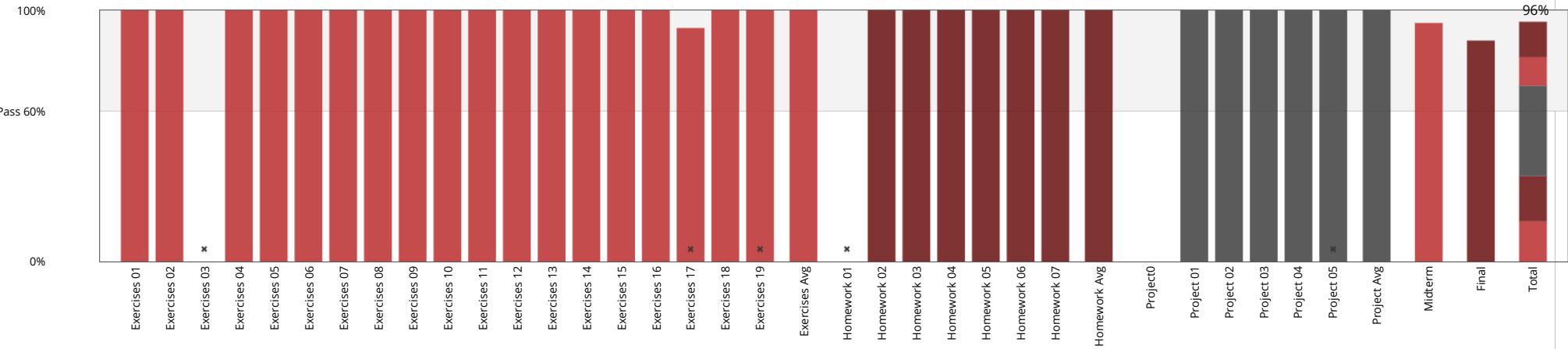


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### Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)



Unit 0. Course Overview,  
Homework 0, Project 0 (1 week)

## Course overview

No problem scores in this section

[edX Tutorial](#)

No problem scores in this section

## Discussion forum and collaboration guidelines

No problem scores in this section

Homework mechanics and standard notation

**Practice Scores:** 0/0 0/0 0/0 0/0 0/0 0/0

Micromasters, Certification, and Honor Pledge

Practice Scores: 0/0

## Brief Review of Vectors, Planes, and Optimization

No problem scores in this section

**Homework 0** (0/32) 0%

Homework due Jun 20, 2019 05:29 IST

**Problem Scores:** 0/3 0/1 0/1 0/3 0/1 0/1 0/1 0/1 0/1 0/4 0/1 0/1 0/1 0/1 0/1 0/1 0/1

[Project 0 Setup](#), [Numpy Exercises](#), [Tutorial on Common Packages](#) (0/5) 0%

Project0 due Jun 28, 2019 05:29 IST

Problem Scores: 0/1 0/1 0/1 0/1 0/1

## Entrance Survey

## Entrance survey

No problem scores in this section

## Unit 1 Linear Classifiers and Generalizations (2 weeks)

### Course Introduction

No problem scores in this section

### Lecture 1. Introduction to Machine Learning (11/11) 100%

Exercises due Jun 27, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lecture 2. Linear Classifier and Perceptron (18/18) 100%

Exercises due Jun 27, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

1/1 1/1 0/0

### Lecture 3 Hinge loss, Margin boundaries and Regularization (0/12) 0%

Exercises due Jun 27, 2019 05:29 IST

Problem Scores: 0/1 0/1 0/1 0/3 0/4 0/1 0/1

### Homework 1 (28/28) 100%

Homework due Jun 27, 2019 05:29 IST

Problem Scores: 4/4 1/1 4/4 1/1 0/0 0/0 2/2 2/2 3/3 2/2 2/2 1/1 2/2 1/1 2/2 1/1

0/0 0/0 0/0 0/0 0/0

### Lecture 4. Linear Classification and Generalization (11/11) 100%

Exercises due Jul 3, 2019 05:29 IST

Problem Scores: 1/1 1/1 2/2 2/2 1/1 1/1 1/1 1/1 1/1

### Homework 2 (12/12) 100%

Homework due Jul 3, 2019 05:29 IST

Problem Scores: 1/1 2/2 1/1 1/1 1/1 1/1 3/3 1/1 1/1

### Project 1: Automatic Review Analyzer (39/39) 100%

Project due Jul 5, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 6/6 1/1 1/1 1/1 3/3 7/7 1/1 10/10 1/1

1/1

---

Unit 2 Nonlinear Classification,  
Linear regression, Collaborative  
Filtering (2 weeks)

Lecture 5. Linear Regression (9/9) 100%

Exercises due Jul 14, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 0/0 1/1 1/1 1/1

Lecture 6. Nonlinear Classification (13/13) 100%

Exercises due Jul 14, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

Lecture 7. Recommender Systems (9/9) 100%

Exercises due Jul 14, 2019 05:29 IST

Problem Scores: 0/0 0/0 2/2 2/2 1/1 1/1 1/1 2/2

Homework 3 (25/25) 100%

Homework due Jul 14, 2019 05:29 IST

Problem Scores: 1/1 2/2 1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 2/2 5/5 2/2 2/2 2/2

Project 2: Digit recognition (Part 1) (72/72) 100%

Project due Jul 19, 2019 05:29 IST

Problem Scores: 5/5 1/1 1/1 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5 5/5 1/1 1/1 2/2 3/3 3/3  
1/1 3/3 3/3 1/1 1/1 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2 3/3 3/3

---

Unit 3 Neural networks (2.5 weeks)

Lecture 8. Introduction to Feedforward Neural Networks (14/14) 100%

Exercises due Jul 28, 2019 05:29 IST

Problem Scores: 2/2 2/2 2/2 3/3 2/2 1/1 1/1 1/1

Lecture 9. Feedforward Neural Networks, Back Propagation, and Stochastic Gradient Descent (SGD) (5/5) 100%

Exercises due Jul 28, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1

Lecture 10. Recurrent Neural Networks 1 (18/18) 100%

Exercises due Jul 28, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 3/3 1/1 6/6 1/1 1/1 1/1 1/1 1/1 1/1

Lecture 11. Recurrent Neural Networks 2 (18/18) 100%

Exercises due Jul 28, 2019 05:29 IST

Problem Scores: 1/1 2/2 1/1 2/2 1/1 3/3 3/3 3/3 1/1 1/1

Homework 4 (26/26) 100%

Homework due Jul 28, 2019 05:29 IST

Problem Scores: 2/2 1/1 3/3 3/3 1/1 1/1 1/1 2/2 2/2 4/4 4/4 1/1 1/1

Lecture 12. Convolutional Neural Networks (11/11) 100%

Exercises due Aug 2, 2019 05:29 IST

Problem Scores: 2/2 1/1 2/2 2/2 1/1 1/1 1/1 1/1

Project 3: Digit recognition (Part 2) (39/39) 100%

Project due Aug 2, 2019 05:29 IST

Problem Scores: 2/2 2/2 5/5 5/5 1/1 1/1 1/1 5/5 3/3 3/3 5/5 5/5 1/1

## Midterm Exam (1 week)

Midterm Exam 1 (36/38) 95%

Midterm due Aug 8, 2019 05:29 IST

Problem Scores: 2/2 1/1 2/2 2/2 1/1 1/1 1/1 1/1 2/2 1/1 1/1 3/3 1/1 1/1 0/1 1/1  
3/3 4/4 1/2 5/5 3/3

## Unit 4 Unsupervised Learning (2 weeks)

Lecture 13. Clustering 1 (21/21) 100%

Exercises due Aug 18, 2019 17:29 IST

Problem Scores: 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 3/3 2/2 3/3 1/1 1/1

Lecture 14. Clustering 2 (10/10) 100%

Exercises due Aug 18, 2019 17:29 IST

Problem Scores: 1/1 2/2 1/1 1/1 1/1 2/2 1/1 1/1

Lecture 15. Generative Models (22/22) 100%

Exercises due Aug 18, 2019 17:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 2/2 1/1 1/1 2/2 1/1 1/1

Lecture 16. Mixture Models; EM algorithm (19/19) 100%

Exercises due Aug 18, 2019 17:29 IST

Problem Scores: 1/1 1/1 1/1 4/4 5/5 3/3 1/1 3/3

Homework 5 (32/32) 100%

Homework due Aug 18, 2019 17:29 IST

Problem Scores: 4/4 4/4 4/4 4/4 1/1 1/1 1/1 1/1 1/1 5/5 3/3 1/1 1/1 1/1 1/1

Project 4: Collaborative Filtering via Gaussian Mixtures (14/14) 100%

Project due Aug 23, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

---

Unit 5 Reinforcement Learning  
(2 weeks)

Lecture 17. Reinforcement Learning 1 (14/15) 93%

Exercises due Sep 1, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1

Lecture 18. Reinforcement Learning 2 (9/9) 100%

Exercises due Sep 1, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

Lecture 19: Applications: Natural Language Processing (8/8) 100%

Exercises due Sep 1, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 0/0 1/1 1/1 1/1

Homework 6 (36/36) 100%

Homework due Sep 3, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 4/4 3/3 1/1 1/1 6/6 3/3 5/5 3/3 3/3 1/1 1/1 1/1

Project 5: Text-Based Game (14/14) 100%

Project due Sep 7, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 2/2 0/0 0/0 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Final exam (1 week)

Final Exam (39/44.5) 88%

Final due Sep 10, 2019 19:29 IST

Problem Scores: 0/0 2/2.5 4/4 1/1 3/3 1/3 1/1 4/4 1/1 1/1 0/1 3/3 1/1 1/1 1/1 1/1  
2/2 3/3 1/2 1/1 2/2 3/3 0/1 1/1 1/1

## Exit Survey

Exit survey

No problem scores in this section

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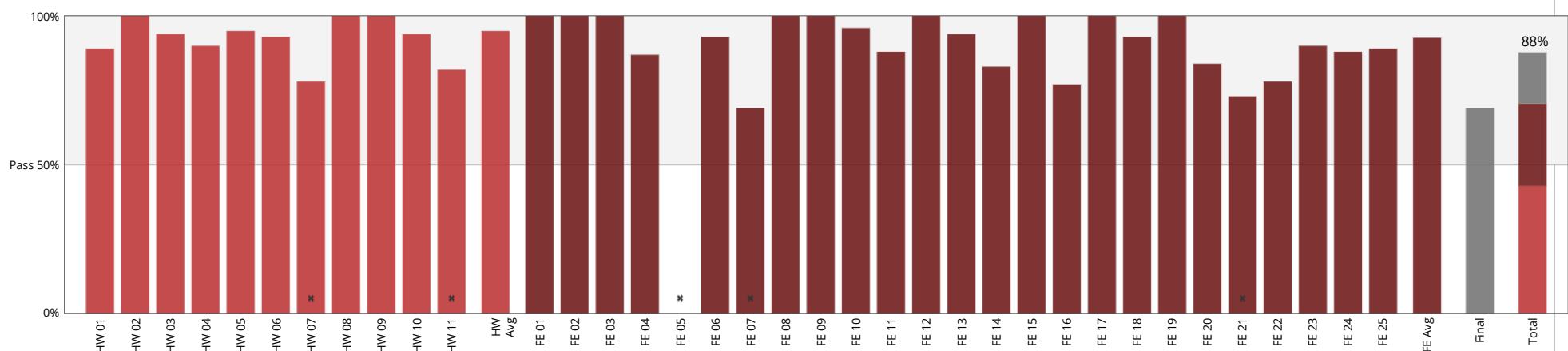
x



## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Module 1: The Basics of R and Introduction to the Course

#### Welcome to the Course

No problem scores in this section

#### Introduction to R

No problem scores in this section

#### Introductory Lecture (14/14) 100%

Finger Exercises due Oct 3, 2016 05:00 IST

Problem Scores: 1/1

#### Module 1: Homework (16/18) 89%

Homework due Sep 26, 2016 05:00 IST

Problem Scores: 1/1 1/1 0/0 0/0 1/1 1/1 1/1 1/1 0/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Entrance Survey

Entrance Survey

No problem scores in this section

## Module 2: Fundamentals of Probability, Random Variables, Distributions, and Joint Distributions

Fundamentals of Probability (27/27) 100%

Finger Exercises due Oct 10, 2016 05:00 IST

Problem Scores: 1/1

Random Variables, Distributions, and Joint Distributions (19/19) 100%

Finger Exercises due Oct 10, 2016 05:00 IST

Problem Scores: 1/1 0/0

Module 2: Homework (15/15) 100%

Homework due Oct 3, 2016 05:00 IST

Problem Scores: 1/1

## Module 3: Gathering and Collecting Data, Ethics, and Kernel Density Estimates

Gathering and Collecting Data (13/15) 87%

Finger Exercises due Oct 17, 2016 05:00 IST

Problem Scores: 0/1 1/1 1/1 1/1 0/0 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

Summarizing and Describing Data (0/26) 0%

Finger Exercises due Oct 17, 2016 05:00 IST

Problem Scores: 0/1

Module 3: Homework (15/16) 94%

Homework due Oct 10, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Module 4: Joint, Marginal, and Conditional Distributions &amp; Functions of Random Variable

Joint, Marginal, and Conditional Distributions (13/14) 93%

Finger Exercises due Oct 24, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1

Functions of Random Variables (9/13) 69%

Finger Exercises due Oct 24, 2016 05:00 IST

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 0/0 0/1 0/1 1/1

Module 4: Homework (18/20) 90%

Homework due Oct 17, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 0/1  
1/1 1/1 1/1 1/1

---

Module 5: Moments of a Random Variable, Applications to Auctions, & Intro to Regression

Moments of a Distribution and Auctions (17/17) 100%

Finger Exercises due Oct 31, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/0 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1Expectation, Variance, and an Introduction to Regression (27/27) 100%

Finger Exercises due Oct 31, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1Module 5: Homework (19/20) 95%

Homework due Oct 24, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1

---

Module 6: Special Distributions, the Sample Mean, the Central Limit Theorem, and Estimation

Human Subjects and Special Distributions (26/27) 96%

Finger Exercises due Nov 7, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/0 1/1 1/1 1/1 1/1 1/1

The Sample Mean, Central Limit Theorem, and Estimation (15/17) 88%

Finger Exercises due Nov 7, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 0/1 1/1 0/1

Module 6: Homework (14/15) 93%

Homework due Oct 31, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Module 7: Assessing and Deriving Estimators - Confidence Intervals, and Hypothesis Testing

Assessing and Deriving Estimators (26/26) 100%

Finger Exercises due Nov 14, 2016 05:00 IST

Problem Scores: 1/1

Confidence Intervals and Hypothesis Testing (15/16) 94%

Finger Exercises due Nov 14, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 0/1 0/0 1/1 1/1 1/1 0/0 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/0 1/1

Module 7: Homework (7/9) 78%

Homework due Nov 7, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 0/1

## Module 8: Causality, Analyzing Randomized Experiments, &amp; Nonparametric Regression

Causality (15/18) 83%

Finger Exercises due Nov 21, 2016 05:00 IST

Problem Scores: 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 0/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1Analyzing Randomized Experiments (23/23) 100%

Finger Exercises due Nov 21, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1Use of Randomization and Nonparametric Regression (17/22) 77%

Finger Exercises due Nov 21, 2016 05:00 IST

Problem Scores: 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 0/1 1/1 0/1 1/1 1/1 1/1  
1/1 0/1 1/1 0/1 1/1 1/1Module 8: Homework (14/14) 100%

Homework due Nov 14, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Module 9: Single and Multivariate Linear Models

The Linear Model (37/37) 100%

Finger Exercises due Nov 28, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1The Multivariate Linear Model (13/14) 93%

Finger Exercises due Nov 28, 2016 05:00 IST

Problem Scores: 0/0 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

Module 9: Homework (18/18) 100%

Homework due Nov 21, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1

## Module 10: Practical Issues in Running Regressions, and Omitted Variable Bias

Practical Issues in Running Regressions (22/22) 100%

Finger Exercises due Dec 5, 2016 05:00 IST

Problem Scores: 1/1

Omitted Variable Bias (21/25) 84%

Finger Exercises due Dec 5, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 0/1 1/1 1/1 0/1 1/1 0/0 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

Module 10: Homework (16/17) 94%

Homework due Nov 28, 2016 05:00 IST

Problem Scores: 0/1 1/1

## Module 11: Intro to Machine Learning and Data Visualization

Machine Learning I (16/22) 73%

Finger Exercises due Dec 12, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 0/1 0/1 1/1 1/1 1/1 0/1 1/1 1/1 0/0 1/1 1/1 0/1 1/1 1/1 1/1 1/1 0/1

Machine Learning II (18/23) 78%

Finger Exercises due Dec 12, 2016 05:00 IST

Problem Scores: 0/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 0/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1

Visualizing Data (18/20) 90%

Finger Exercises due Dec 12, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 0/1 0/1 1/1 1/1 1/1 0/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Module 12: Endogeneity, Instrumental Variables, and Experimental Design

[Endogeneity and Instrumental Variables](#) (22/25) 88%

Finger Exercises due Dec 14, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Experimental Design](#) (24/27) 89%

Finger Exercises due Dec 14, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1

[Module 12: Homework](#) (14/17) 82%

Homework due Dec 12, 2016 05:00 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1

## Exit Survey

[Exit Survey](#).

No problem scores in this section

## Final Exam

[Final Exam](#) (18.7/27) 69%

Final Exam due Dec 19, 2016 05:00 IST

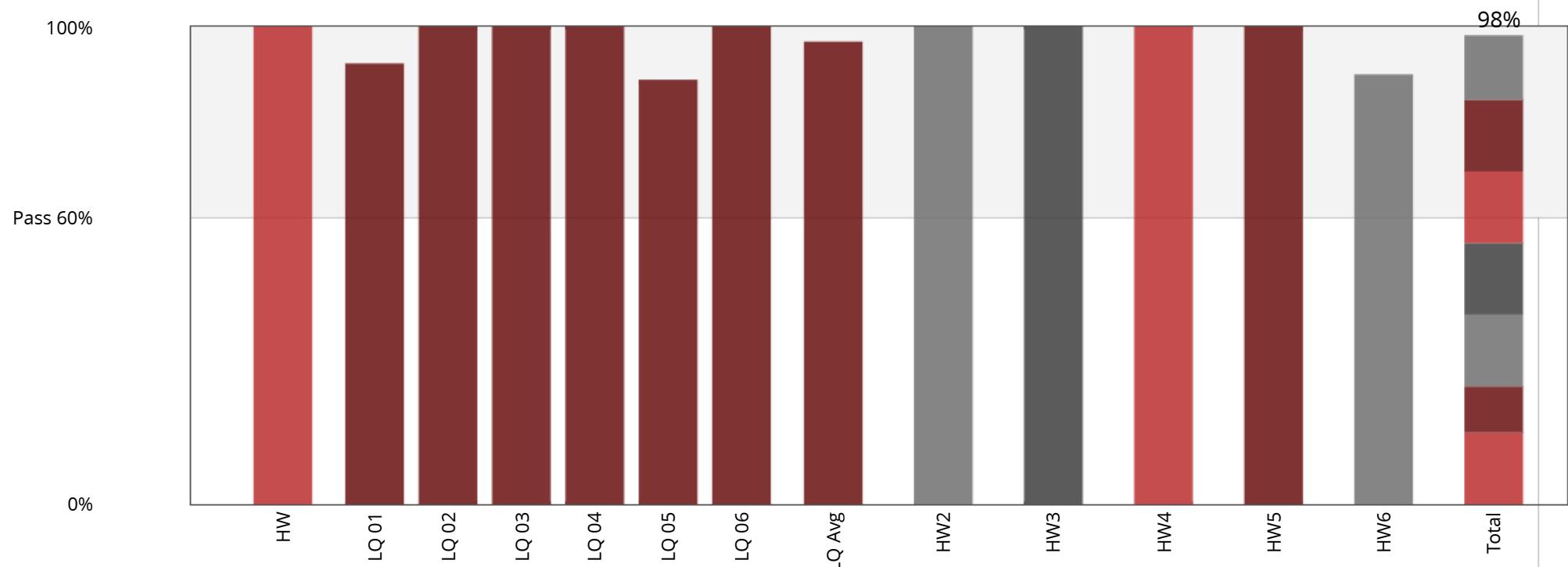
Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 0/1 1/1 1/1 0/1 0/1 1/1 0.5/1 1/1  
0.5/1 0.667/1 0/1 0/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 0/1 0/1 1/1 0.5/1 1/1[Solutions: R Code](#)

No problem scores in this section

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

**Your enrollment: Audit track**

You are enrolled in the audit track for this course. The audit track does not include a certificate.

**General Information****General Information**

None

No problem scores in this section

### Important Entrance Survey

None

No problem scores in this section

### Recitation 0

None

Practice Scores: 0/0 0/0 0/0 0/0 0/0

---

## Week 1

### Lecture 1 (12/13) 92%

Lecture questions due Sep 13, 2016 at 14:00 UTC

Problem Scores: 1/1 1/1 1/1 0/0 1/1 0/0 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Recitation 1

None

No problem scores in this section

### Problem Set 1 (18/18) 100%

Homework 1 due Sep 13, 2016 at 14:00 UTC

Problem Scores:

1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

---

## Week 2

### Lecture 2 (9/9) 100%

Lecture questions due Sep 20, 2016 at 14:00 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Recitation 2

None

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Problem Set 2 (48/48) 100%

Homework 2 due Sep 20, 2016 at 14:00 UTC

Problem Scores:

1/1 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 3/3 1/1 1/1 1/1 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1

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## Week 3

### Lecture (6/6) 100%

Lecture questions due Sep 27, 2016 at 14:00 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

### Recitation

None

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Problem Set 3 (31/31) 100%

Homework 3 due Sep 27, 2016 at 14:00 UTC

Problem Scores:

1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

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## Week 4

### Lecture (10/10) 100%

Lecture questions due Oct 04, 2016 at 14:00 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

**Recitation**

None

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

**Problem Set 4 (42/42) 100%**

Homework 4 due Oct 04, 2016 at 14:00 UTC

Problem Scores:

1/1 1/1 1/1 1/1 3/3 1/1 1/1 1/1 2/2 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 2/2 1/1 1/1 1/1 3/3 1/1 1/1 3/3 3/3 1/1

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**Week 5****Lecture (8/9) 89%**

Lecture questions due Oct 11, 2016 at 14:00 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1

**Recitation (0/2)**

None

Practice Scores: 0/0 0/0 0/0 0/0 0/1 0/0 0/1 0/0 0/0 0/0

**Problem Set 5 (16/16) 100%**

Homework 5 due Oct 11, 2016 at 14:00 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

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**Week 6****Lecture (13/13) 100%**

Lecture questions due Oct 18, 2016 at 14:00 UTC

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Recitation

None

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Problem Set 6 (27/30) 90%

Homework 6 due Oct 18, 2016 at 14:00 UTC

Problem Scores:

1/1 1/1 1/1 1/1 2/2 2/2 2/2 3/3 3/3 0/3 1/1 1/1 1/1 1/1 1/1

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## Exit Survey

### Important Exit Survey

None

No problem scores in this section



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# HONOR CODE CERTIFICATE



**Dimitris Bertsimas**

Boeing Leaders for Global Operations Professor of  
Management, Operations Research and Statistics  
Co-Director of the Operations Research Center  
*MIT Sloan School of Management*

# Sandipan Dey

successfully completed and received a passing grade in

## 15.071x: The Analytics Edge

a course of study offered by MITx, an online learning  
initiative of The Massachusetts Institute of Technology through edX.

**HONOR CODE CERTIFICATE**  
Issued May 23rd, 2014

Verify the authenticity of this certificate at  
<https://verify.edx.org/cert/b95b8b46d9a64edc8aed779a7448e727>

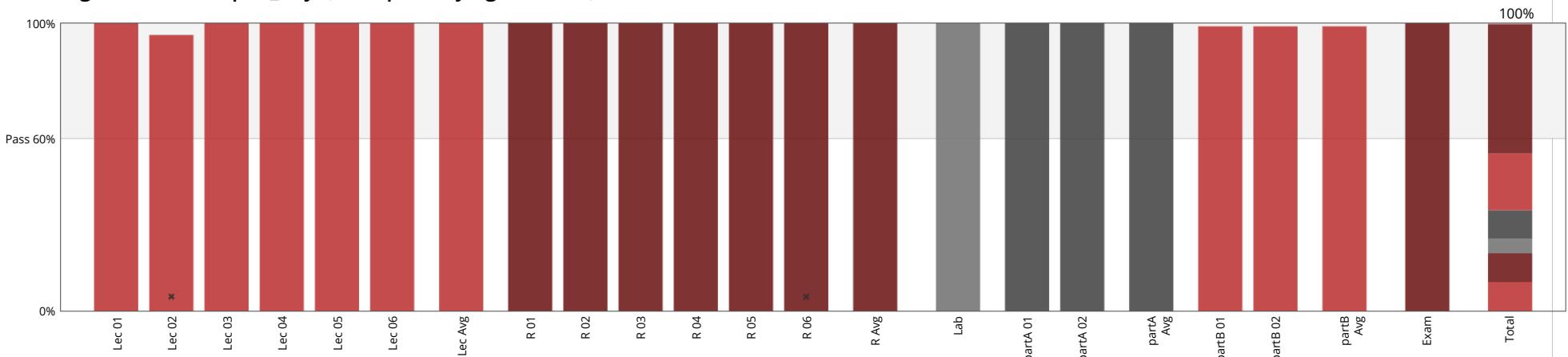
**Allison O'Hair**

Lecturer, Operations Research and Statistics  
*MIT Sloan School of Management*

**Sanjay Sarma**

Director of Digital Learning  
*Massachusetts Institute of Technology*

## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)



## Getting started

[Entrance survey](#).

No problem scores in this section

[Overview and logistics](#)

No problem scores in this section

[Using the edX platform](#) (0/1) 0%

Practice Scores: 0/0 0/1 0/0 0/0 0/0

[Introduction to matlab](#) (0/2) 0%

Practice Scores: 0/1 0/1

[Using the forum](#)

No problem scores in this section

[Syllabus and schedule](#)

No problem scores in this section

## Unit 1: Fourier Series

### 1. Introduction to Fourier Series (23/23) 100%

Lecture

Problem Scores: 1/1 1/1 1/1 1/1 1/1 0/0 0/0 9/9 1/1 1/1 1/1 1/1 1/1 1/1 3/3

### MATLAB Recitation 1 (6/6) 100%

Recitation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

### 2. Properties of Fourier Series (of Period 2L) (25/26) 96%

Lecture

Problem Scores: 6/6 1/1 1/1 1/1 2/2 1/1 1/1 2/2 2/2 1/1 7/8

### Recitation 2 (10/10) 100%

Recitation

Problem Scores: 2/2 1/1 1/1 1/1 5/5

### Lab: Discrete Fourier Transform and Signal Processing (7/7) 100%

Laboratory

Problem Scores: 1/1 1/1 3/3 0/0 1/1 1/1

### 3. Solving ODEs with Fourier Series and Signal Processing (6/6) 100%

Lecture

Problem Scores: 1/1 1/1 2/2 1/1 1/1

### Recitation 3 (9/9) 100%

Recitation

Problem Scores: 1/1 1/1 1/1 3/3 3/3

### Part A Homework 1 (125/125) 100%

Part A

Problem Scores: 5/5 5/5 10/10 5/5 5/5 10/10 15/15 5/5 5/5 10/10 10/10 10/10 10/10 15/15  
5/5

### Part B Homework 1 (12.9/13) 99%

Part B

Problem Scores: 1/1 1/1 3/3 1/1 5/5 1.92/2 0/0

#### 4. Boundary Value Problems (39/39) 100%

Lecture

Problem Scores: 1/1 1/1 1/1 1/1 8/8 8/8 8/8 8/8 1/1 1/1 1/1 0/0

#### Recitation 4 (with MATLAB) (12/12) 100%

Recitation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 2/2 4/4 1/1

#### 5. The Heat Equation (15/15) 100%

Lecture

Problem Scores: 1/1 2/2 1/1 3/3 1/1 1/1 4/4 2/2

#### Recitation 5 (with MATLAB) (16/16) 100%

Recitation

Problem Scores: 1/1 1/1 1/1 1/1 1/1 5/5 3/3 1/1 2/2

#### 6. The Wave Equation (7/7) 100%

Lecture

Problem Scores: 1/1 2/2 0/0 2/2 1/1 1/1

#### Recitation 6 (with MATLAB) (9/9) 100%

Recitation

Problem Scores: 1/1 3/3 5/5

#### Part A Homework 2 (95/95) 100%

Part A

Problem Scores: 15/15 15/15 5/5 5/5 15/15 10/10 10/10 10/10 10/10

#### Part B Homework 2 (14.9/15) 99%

Part B

Problem Scores: 2/2 1/1 1/1 0.88/1 1/1 1/1 2/2 4/4 2/2

Exit survey and thank you

**Thank you!**

No problem scores in this section

**Exit Survey**

No problem scores in this section

Final exam

**READ FIRST**

No problem scores in this section

**Final Exam (TIMED)** (19/19) 100%

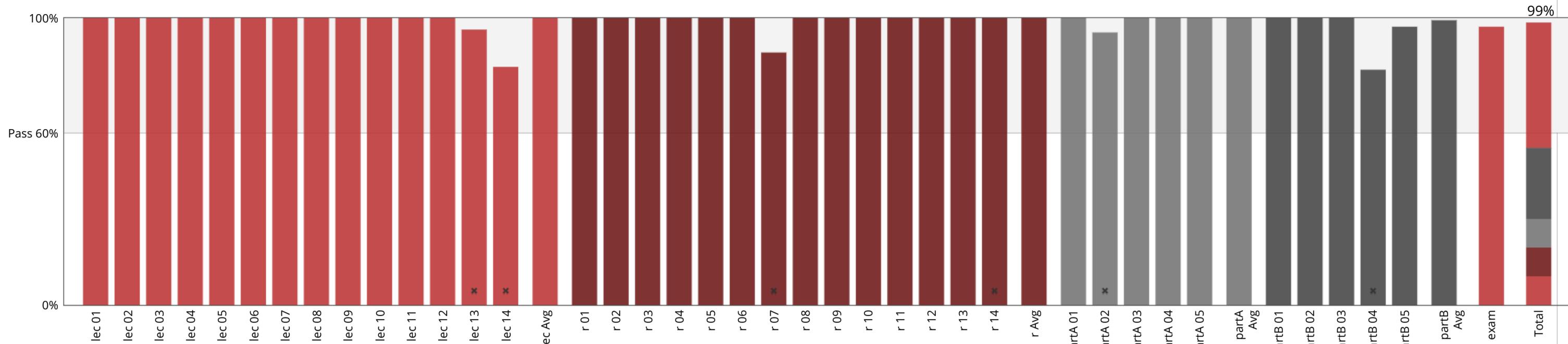
Exam due Jun 30, 2020 21:30 IST

Problem Scores: 1/1 1/1 1/1 2/2 2/2 1/1 1/1 1/1 2/2 2/2 1/1 2/2 0/0

You are taking "Exam" as a timed exam. The timer on the right shows the time remaining in the exam. To receive credit for problems, you must select "Submit" for each problem before you select "End My Exam". [Show Less](#)

[End My Exam](#) 33:12:01

## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)



## Entrance Survey

### [Entrance survey](#)

No problem scores in this section

## Getting started

### [Overview and logistics](#)

No problem scores in this section

### [Using the edX platform](#) (0/1) 0%

Practice Scores: 0/0 0/1 0/0 0/0 0/0

### [Using the forum](#)

No problem scores in this section

### [Syllabus and schedule](#)

No problem scores in this section

## Unit 1: Modeling and First Order ODEs

### [1 Introduction to Differential Equations and Modeling](#) (4/4) 100%

Lecture due Jun 29, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1

### [Recitation 1](#) (11/11) 100%

Recitation due Jun 29, 2020 20:30 IST

Problem Scores: 1/1 2/2 2/2 1/1 2/2 1/1 1/1 1/1 1/1 1/1

### [2 Solving First-order ODEs](#) (13/13) 100%

Lecture due Jun 29, 2020 20:30 IST

Problem Scores: 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### [Recitation 2](#) (5/5) 100%

Recitation due Jun 29, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 0/0

### [Part A Homework 1](#) (12/12) 100%

Part A due Jun 29, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 2/2 1/1 2/2 2/2 2/2

### [Part B Homework 1](#) (9/9) 100%

Part B due Jun 29, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Unit 2: Complex Exponentials and ODEs

### 3 Introduction to Complex Numbers (23/23) 100%

Lecture due Jul 21, 2020 20:30 IST

Problem Scores: 4/4 1/1 3/3 1/1 2/2 1/1 8/8 2/2 1/1

### Recitation 3 (8/8) 100%

Recitation due Jul 21, 2020 20:30 IST

Problem Scores: 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1

### 4 The Complex Exponential Function (9/9) 100%

Lecture due Jul 21, 2020 20:30 IST

Problem Scores: 2/2 1/1 2/2 4/4

### Recitation 4 (9/9) 100%

Recitation due Jul 21, 2020 20:30 IST

Problem Scores: 1/1 1/1 0/0 1/1 1/1 1/1 1/1 1/1 1/1

### 5 Homogeneous 2nd Order Linear ODEs with Constant Coefficients (5/5) 100%

Lecture due Jul 21, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1

### Recitation 5 (12/12) 100%

Recitation due Jul 21, 2020 20:30 IST

Problem Scores: 1/1 2/2 2/2 1/1 1/1 2/2 1/1 1/1 1/1

### Part A Homework 2 (90/95) 95%

Part A due Jul 21, 2020 20:30 IST

Problem Scores: 5/5 5/5 5/5 5/5 10/10 10/10 5/5 5/5 5/5 5/5 5/5 10.1/15 5/5 5/5

### Part B Homework 2 (34/34) 100%

Part B due Jul 21, 2020 20:30 IST

Problem Scores: 6/6 8/8 4/4 6/6 1/1 5/5 4/4

## Unit 3: Damped Oscillations

### 6 Sinusoidal Functions (23/23) 100%

Lecture due Aug 10, 2020 20:30 IST

Problem Scores: 2/2 1/1 1/1 2/2 2/2 3/3 3/3 6/6 1/1 2/2 0/0

### Recitation 6 (22/22) 100%

Recitation due Aug 10, 2020 20:30 IST

Problem Scores: 3/3 3/3 3/3 4/4 1/1 3/3 4/4 1/1

### 7 Damped Harmonic Oscillators (13/13) 100%

Lecture due Aug 10, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Recitation 7 (15/17) 88%

Recitation due Aug 10, 2020 20:30 IST

Problem Scores: 5/5 4/4 1/1 1/1 2/2 1/1 1/1 0/2

### 8 Higher Order Linear ODEs (4/4) 100%

Lecture due Aug 10, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1

### Recitation 8 (8/8) 100%

Recitation due Aug 10, 2020 20:30 IST

Problem Scores: 1/1 1/1 2/2 1/1 1/1 1/1 1/1

### Part A Homework 3 (105/105) 100%

Part A due Aug 10, 2020 20:30 IST

Problem Scores: 10/10 5/5 5/5 5/5 10/10 10/10 15/15 10/10 10/10 5/5 5/5 5/5 10/10

### Part B Homework 3 (15/15) 100%

Part B due Aug 10, 2020 20:30 IST

Problem Scores: 1/1 2/2 1/1 1/1 3/3 1/1 2/2 2/2 1/1 1/1

## Unit 4: Exponential Response and Resonance

## 9 Operators and Exponential Response (7/7) 100%

Lecture due Sep 11, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Recitation 9 (12/12) 100%

Recitation due Sep 11, 2020 20:30 IST

Problem Scores: 2/2 1/1 1/1 3/3 1/1 1/1 1/1 3/3

## 10 Complex Replacement, Gain and Phase Lag, Stability (9/9) 100%

Lecture due Sep 11, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Recitation 10 (12/12) 100%

Recitation due Sep 11, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 3/3

## 11 Resonance, Frequency Response, RLC circuits (32/32) 100%

Lecture due Sep 11, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 5/5 5/5 6/6 2/2 1/1 3/3 3/3 1/1 1/1

## Recitation 11 (15/15) 100%

Recitation due Sep 11, 2020 20:30 IST

Problem Scores: 2/2 1/1 2/2 2/2 2/2 3/3 1/1 2/2

## Part A Homework 4 (100/100) 100%

Part A due Sep 11, 2020 20:30 IST

Problem Scores: 15/15 5/5 5/5 5/5 10/10 10/10 10/10 10/10 15/15 15/15

## Part B Homework 4 (14/17) 82%

Part B due Sep 11, 2020 20:30 IST

Problem Scores: 5/6 3/3 3/3 1/1 2/2 0/2

## Unit 5: Nonlinear DEs

## 12 Nonlinear DEs: Graphical methods (19/19) 100%

Lecture due Sep 16, 2020 20:30 IST

Problem Scores: 8/8 1/1 3/3 1/1 2/2 1/1 1/1 2/2 0/0

## Recitation 12 (5/5) 100%

Recitation due Sep 16, 2020 20:30 IST

Problem Scores: 1/1 3/3 1/1

## 13 Autonomous equations (25/26) 96%

Lecture due Sep 16, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1

## Recitation 13 (8/8) 100%

Recitation due Sep 16, 2020 20:30 IST

Problem Scores: 1/1 1/1 2/2 2/2 2/2

## 14 Numerical methods (5/6) 83%

Lecture due Sep 16, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 0/1 1/1 1/1

## Recitation 14 (14/14) 100%

Recitation due Sep 16, 2020 20:30 IST

Problem Scores: 12/12 1/1 1/1

## Part A Homework 5 (60/60) 100%

Part A due Sep 16, 2020 20:30 IST

Problem Scores: 5/5 10/10 5/5 10/10 10/10 5/5 5/5 5/5 5/5

## Part B Homework 5 (36/37) 97%

Part B due Sep 16, 2020 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 3/3 3/3 1/1 6/7 10/10 5/5 1/1 2/2 1/1

## Exam Practice

### Exam practice

No problem scores in this section

### Exit Survey

No problem scores in this section

## Exam

### READ FIRST

No problem scores in this section

### Exam (29/30) 97%

Exam due Sep 16, 2020 20:30 IST

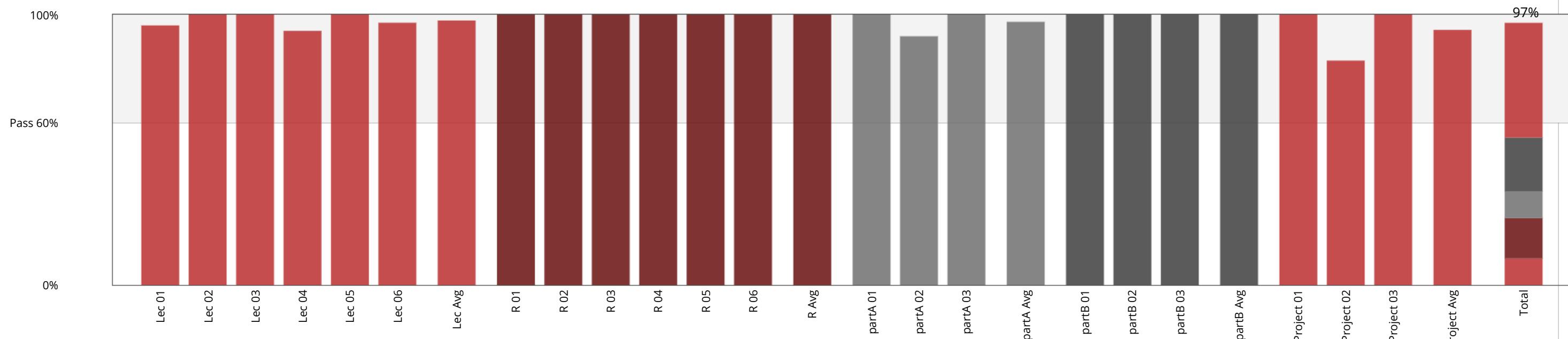
Problem Scores: 1/1 2/2 1/1 1/1 1/1 2/2 1/1 3/3 0/1 1/1 1/1 1/1 2/2 1/1 1/1



## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Getting started

#### Entrance survey

No problem scores in this section

#### Overview and logistics

No problem scores in this section

#### Using the edX platform (0/1)

Practice Scores: 0/0 0/1 0/0 0/0 0/0

#### Introduction to matlab (0/3)

Practice Scores: 0/1 0/1 0/1

#### Using the forum

No problem scores in this section

#### Syllabus and schedule

No problem scores in this section

## Unit 1: Linear Algebra, Part 1

1 Elimination and solving linear systems with matrices (27/28) 96%

Lecture due Apr 13, 2018 21:30 IST

Problem Scores: 1/1 3/3 1/1 2/2 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 3/3 3/3 3/3 1/1  
1/1 0/1MATLAB Recitation 1 (4/4) 100%

Recitation due Apr 13, 2018 21:30 IST

Problem Scores: 1/1 1/1 1/1 1/1

2 Nullspace and solutions to homogeneous linear systems (23/23) 100%

Lecture due Apr 13, 2018 21:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1MATLAB Recitation 2 (5/5) 100%

Recitation due Apr 13, 2018 21:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1

Part A Homework 1 (65/65) 100%

Part A due Apr 25, 2018 21:30 IST

Problem Scores: 5/5 5/5 5/5 5/5 5/5 5/5 5/5 10/10 10/10 5/5 5/5

Part B Homework 1 (10/10) 100%

Part B due Apr 25, 2018 21:30 IST

Problem Scores: 2/2 2/2 2/2 1/1 3/3

## Unit 2: Linear Algebra, Part 2

[3 Column space and solving inhomogeneous linear systems](#) (35/35) 100%

Lecture due May 6, 2018 21:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 4/4  
4/4 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 4/4[MATLAB Recitation 3](#) (7/7) 100%

Recitation due May 6, 2018 21:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 2/2 1/1

[4 Eigenvalues and eigenvectors](#) (17/18) 94%

Lecture due May 6, 2018 21:30 IST

Problem Scores: 1/1 1/1 2/2 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 0/1 1/1

[MATLAB Recitation 4](#) (5/5) 100%

Recitation due May 6, 2018 21:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1

[Part A Homework 2](#) (59/64) 92%

Part A due May 6, 2018 21:30 IST

Problem Scores: 5/5 1/1 1/1 1/1 10/10 10/10 15/15 5/5 1/1 0/5 5/5 5/5

[Part B Homework 2](#) (23/23) 100%

Part B due May 6, 2018 21:30 IST

Problem Scores: 4/4 2/2 1/1 3/3 2/2 1/1 2/2 2/2 2/2 1/1 1/1 2/2

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Unit 3: Solving systems of first order ODEs using matrix methods

[5 Solving homogeneous NxN systems](#) (19/19) 100%

Lecture due May 26, 2018 21:30 IST

Problem Scores: 1/1 1/1 4/4 2/2 1/1 1/1 4/4 1/1 4/4

[MATLAB Recitation 5](#) (5/5) 100%

Recitation due May 26, 2018 21:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1

[6 Decoupling and solving inhomogeneous linear systems of ODEs](#) (15.5/16) 97%

Lecture due May 26, 2018 21:30 IST

Problem Scores: 1/1 1/1 2/2 1/1 2/2 1/1 4/4 3/3 0.5/1 0/0

[MATLAB Recitation 6](#) (4/4) 100%

Recitation due May 26, 2018 21:30 IST

Problem Scores: 1/1 1/1 1/1 1/1

[Part A Homework 3](#) (88/88) 100%

Part A due May 26, 2018 21:30 IST

Problem Scores: 5/5 5/5 8/8 10/10 5/5 5/5 5/5 10/10 10/10 10/10 5/5 10/10

[Part B Homework 3](#) (21/21) 100%

Part B due May 26, 2018 21:30 IST

Problem Scores: 1/1 1/1 3/3 1/1 1/1 1/1 2/2 1/1 1/1 1/1 1/1 3/3 1/1 3/3

Final project: Applications to nonlinear differential equations

[About the final project \(READ FIRST\)](#)

No problem scores in this section

[Project 1: Review of nonlinear populations models](#) (11/11) 100%

Project due Jun 1, 2018 21:30 IST

Problem Scores: 0/0 0/0 0/0 2/2 2/2 2/2 2/2 2/2 1/1

[Project 2: Solving nonlinear populations models using MATLAB](#) (5/6) 83%

Project due Jun 1, 2018 21:30 IST

Problem Scores: 1/1 3/3 1/1 0/1

[Project 3: Designing a zipline using MATLAB](#) (12/12) 100%

Project due Jun 1, 2018 21:30 IST

Problem Scores: 4/4 2/2 1/1 1/1 1/1 1/1 2/2

Exit survey and thank you

**Thank you!**

No problem scores in this section

**Exit Survey**

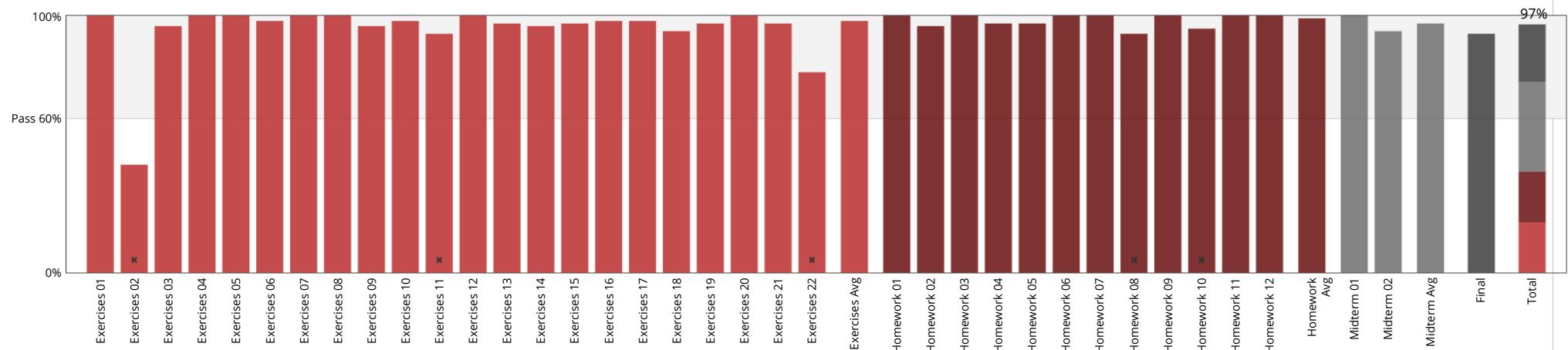
No problem scores in this section

## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your certificate is available

You've earned a certificate for this course.

[View Certificate](#)



Unit 0. Course Overview,  
Syllabus, Guidelines, and  
Homework on Prerequisites

### Course overview

No problem scores in this section

### edX Tutorial

No problem scores in this section

### Discussion forum and collaboration guidelines

No problem scores in this section

### Homework mechanics and standard notation

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0

### Micromasters, Certification, and Honor Pledge

Practice Scores: 0/0

### Homework 0: Probability and Linear algebra Review (65/65) 100%

Homework due Sep 13, 2019 05:29 IST

Problem Scores: 1/1 3/3 3/3 1/1 2/2 5/5 4/4 2/2 4/4 3/3 1/1 2/2 3/3 1/1 2/2 4/4  
1/1 6/6 1/1 4/4 2/2 3/3 5/5 2/2 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Unit 1 Introduction to statistics

### Lecture 1: What is statistics (15/15) 100%

Exercises due Sep 13, 2019 05:29 IST

Problem Scores: 1/1 2/2 2/2 2/2 1/1 1/1 1/1 2/2 1/1 1/1 0/0 1/1

### Lecture 2: Probability Redux (14/33) 42%

Exercises due Sep 13, 2019 05:29 IST

Problem Scores: 3/3 1/1 0/1 4/4 2/2 0/1 0/1 0/1 0/1 0/1 0/1 0/2 0/4 0/3 0/1  
3/4 1/1

## Entrance Survey

### Entrance survey

No problem scores in this section

## Unit 2 Foundation of Inference

### Lecture 3: Parametric Statistical Models (23/24) 96%

Exercises due Sep 20, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 2/2 4/4 1/1 0/0 2/2 1/1 1/1 1/2 2/2 1/1 1/1 1/1  
1/1 1/1

### Lecture 4: Parametric Estimation and Confidence Intervals (26/26) 100%

Exercises due Sep 20, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 0/0 1/1 1/1 1/1 1/1 1/1 4/4 1/1 2/2 2/2  
3/3 3/3

### Recitation 1. Confidence Intervals of the mean of Gaussian random variables

No problem scores in this section

### Homework 1: Estimation, Confidence Interval, Modes of Convergence (43/45) 96%

Homework due Sep 20, 2019 05:29 IST

Problem Scores: 4/4 3/4 2/2 2/2 0/0 1/1 1/1 2/2 2/3 2/2 1/1 2/2 1/1 2/2 2/2 2/2  
1/1 4/4 3/3 3/3 2/2 1/1

### Recitation 2. Modes of Convergence

No problem scores in this section

### Lecture 5: Delta Method and Confidence Intervals (33/33) 100%

Exercises due Sep 26, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 2/2 3/3 2/2 4/4 1/1 3/3 1/1 1/1 1/1 1/1 1/1 6/6  
1/1 1/1 1/1

### Recitation 3: Confidence Intervals of the shift of shifted exponential random variables

No problem scores in this section

### Homework 2: Statistical Models, Estimation, and Confidence Intervals (26/26) 100%

Homework due Sep 26, 2019 05:29 IST

Problem Scores: 1/1 2/2 2/2 2/2 2/2 0/0 2/2 3/3 0/0 3/3 1/1 1/1 3/3 4/4

### Lecture 6: Introduction to Hypothesis Testing, and Type 1 and Type 2 Errors (50/51) 98%

Exercises due Oct 4, 2019 05:29 IST

Problem Scores: 1/1 2/2 2/2 2/2 1/1 1/1 1/1 1/1 1/1 0/1 4/4 0/0 1/1 1/1 1/1 1/1 3/3 2/2  
1/1 1/1 1/1 1/1 1/1 1/1 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Lecture 7: Hypothesis Testing (Continued): Levels and P-values (38/38) 100%

Exercises due Oct 4, 2019 05:29 IST

Problem Scores: 1/1 1/1 5/5 2/2 1/1 1/1 4/4 2/2 2/2 3/3 1/1 3/3 3/3 1/1 1/1 1/1 1/1  
4/4 1/1 1/1

### Recitation 4: Introduction to Hypothesis Testing

No problem scores in this section

### Homework 3: Introduction to Hypothesis Testing (37/38) 97%

Homework due Oct 4, 2019 05:29 IST

Problem Scores: 1/2 1/1 3/3 2/2 1/1 2/2 2/2 2/2 1/1 1/1 1/1 3/3 1/1 3/3 1/1 1/1  
4/4 1/1 2/2 2/2 2/2

Problem Scores: 1/1 1/1 1/1 1/1 4/4 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 3/3

### Recitation 5: Distance measures between distributions

No problem scores in this section

### Lecture 9: Introduction to Maximum Likelihood Estimation (45/47) 96%

Exercises due Oct 11, 2019 05:29 IST

Problem Scores: 2/2 3/3 1/1 0/1 1/1 4/4 4/4 1/1 1/1 1/1 1/1 3/3 3/3 4/4 0/0 2/2 0/1  
1/1 3/3 5/5 3/3 3/3

### Homework 4: TV distance, KL-Divergence, and Introduction to MLE (28/29) 97%

Homework due Oct 11, 2019 05:29 IST

Problem Scores: 1/1 1/1 2/2 1/1 3/3 2/2 1/1 1/1 1/1 2/3 2/2 1/1 3/3 4/4 1/1 1/1  
1/1

### Lecture 10: Consistency of MLE, Covariance Matrices, and Multivariate Statistics (40/41) 98%

Exercises due Oct 18, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 2/2 0/1 1/1 1/1 3/3 1/1 2/2 4/4 4/4 4/4 1/1  
1/1 4/4 1/1 1/1 0/0 1/1 4/4

### Recitation 6: Maximum Likelihood Estimation: Inference for the variance of a Gaussian distribution

No problem scores in this section

### Homework 5: Maximum Likelihood Estimation (19/19) 100%

Homework due Oct 18, 2019 05:29 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2 2/2 1/1 4/4

### Lecture 11: Fisher Information, Asymptotic Normality of MLE; Method of Moments (41/44) 93%

Exercises due Oct 25, 2019 17:29 IST

Problem Scores: 3/3 0/2 1/1 2/2 1/1 1/1 0/1 1/1 4/4 1/1 1/1 1/1 1/1 1/1 1/1 2/2 3/3  
2/2 2/2 3/3 2/2 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2

### Recitation 7: Maximum Likelihood Estimator for Multinomial

No problem scores in this section

### Lecture 12: M-Estimation (47/47) 100%

Exercises due Oct 25, 2019 17:29 IST

Problem Scores: 1/1 1/1 3/3 7/7 1/1 1/1 3/3 4/4 2/2 1/1 3/3 1/1 3/3 4/4 2/2 1/1  
2/2 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Homework 6: Maximum Likelihood Estimation and Method of Moments (54/54) 100%

Homework due Oct 25, 2019 17:29 IST

Problem Scores: 3/3 3/3 3/3 3/3 7/7 6/6 1/1 1/1 1/1 2/2 2/2 3/3 1/1 2/2 1/1 2/2  
1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Recitation 8: M-Estimation

[Recitation 8: Implementation](#)

No problem scores in this section

[Recitation 9: \(Review\) Mean Squared Error](#)

No problem scores in this section

[Recitation 10: \(Review\) Multivariate Gaussian](#)

No problem scores in this section

[Recitation 11: \(Review\) Method of Moments](#)

No problem scores in this section

**Midterm Exam 1**[Midterm Exam 1](#) (29.5/29.5) 100%

Midterm due Oct 30, 2019 05:29 IST

Problem Scores: 5/5 1.5/1.5 1/1 2/2 3/3 1/1 3/3 2/2 1/1 2/2 1/1 2/2 1/1 3/3 1/1

**Unit 4 Hypothesis testing**[Lecture 13: Chi Squared Distribution, T-Test](#) (28/29) 97%

Exercises due Nov 7, 2019 05:29 IST

Problem Scores: 1/1 2/2 2/2 0/1 1/1 1/1 1/1 3/3 1/1 2/2 3/3 4/4 1/1 2/2 3/3 1/1

[Recitation 12: Review: Comparisons of two Proportions](#)

No problem scores in this section

[Recitation 13: T-test](#)

No problem scores in this section

[Lecture 14: Wald's Test, Likelihood Ratio Test, and Implicit Hypothesis Test](#) (27/28) 96%

Exercises due Nov 7, 2019 05:29 IST

Problem Scores: 1/1 0/0 1/1 4/4 1/1 2/2 1/1 1/1 1/1 2/3 3/3 2/2 1/1 1/1 1/1 1/1

[Recitation 14: Wald's test and Likelihood Ratio Test](#)

No problem scores in this section

[Homework 7](#) (27/29) 93%

Homework due Nov 7, 2019 05:29 IST

Problem Scores: 1/1 1/1 0/1 1/1 4/4 2/2 1/1 1/1 2/2 1/1 2/2 2/2 1/1 1/2 2/2 1/1

[Lecture 15: Goodness of Fit Test for Discrete Distributions](#) (29/30) 97%

Exercises due Nov 14, 2019 05:29 IST

Problem Scores: 0/1 1/1 3/3 1/1 2/2 3/3 3/3 1/1 2/2 1/1 1/1 1/1 1/1 1/1 1/1 2/2

### Recitation 15: Chi Squared Goodness of Fit Test

No problem scores in this section

### Lecture 16: Goodness of Fit Tests Continued: Kolmogorov-Smirnov test, Kolmogorov-Lilliefors test, Quantile-Quantile Plots (41/42) 98%

Exercises due Nov 14, 2019 05:29 IST

Problem Scores: 3/3 1/1 1/1 5/5 3/3 2/2 3/3 1/1 1/1 3/3 2/2 1/1 1/1 2/2 1/1  
1/1 0/1 1/1 1/1 2/2 1/1 4/4

### Recitation 16: Sample Kolmogorov-Smirnov test

No problem scores in this section

### Homework 8 (23/23) 100%

Homework due Nov 14, 2019 05:29 IST

Problem Scores: 3/3 1/1 1/1 3/3 1/1 2/2 2/2 2/2 1/1 1/1 1/1 1/1 1/1 3/3

### Recitation 17: (Review) Hypothesis Testing Example with a Uniform Distribution

No problem scores in this section

### Recitation 18: (Review) Which Theta in Wald's test

No problem scores in this section

### Recitation 19: (Review) T test

No problem scores in this section

---

Unit 5 Bayesian statistics

## Lecture 17: Introduction to Bayesian Statistics (55/56) 98%

Exercises due Nov 21, 2019 05:29 IST

|                 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 1/1 | 1/1 | 0/1 | 5/5 | 7/7 | 1/1 | 1/1 | 1/1 | 3/3 | 2/2 | 1/1 | 1/1 | 6/6 | 9/9 | 2/2 | 1/1 |
|                 | 1/1 | 4/4 | 2/2 | 1/1 | 1/1 | 1/1 | 3/3 |     |     |     |     |     |     |     |     |     |

## Recitation 20: Calculating Bayes Posteriors

No problem scores in this section

## Lecture 18: Jeffreys Prior and Bayesian Confidence Interval (31/33) 94%

Exercises due Nov 21, 2019 05:29 IST

|                 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 1/1 | 0/0 | 1/1 | 1/1 | 2/2 | 1/1 | 1/1 | 2/2 | 1/1 | 0/1 | 2/2 | 3/3 | 1/1 | 3/3 | 1/1 | 1/1 |
|                 | 1/1 | 4/4 | 4/4 | 1/2 |     |     |     |     |     |     |     |     |     |     |     |     |

## Recitation 21: Multinomial Bayesian Estimation

No problem scores in this section

## Recitation 22: Jeffreys Prior

No problem scores in this section

## Homework 9: Bayesian Statistics (42/44) 95%

Homework due Nov 21, 2019 05:29 IST

|                 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 3/3 | 4/4 | 3/3 | 1/1 | 2/2 | 4/4 | 2/2 | 2/2 | 2/2 | 0/1 | 0/1 | 1/1 | 2/2 | 2/2 | 0/0 |
|                 | 3/3 | 3/3 | 3/3 | 3/3 |     |     |     |     |     |     |     |     |     |     |     |

## (Optional) Recitation: Jeffreys Prior in Higher Dimension

No problem scores in this section

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## Midterm Exam 2

## Midterm Exam 2 (35.7/38) 94%

Midterm due Nov 28, 2019 05:29 IST

|                 |     |     |     |     |     |        |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 2/2 | 1/1 | 1/1 | 1/1 | 2/2 | 0.67/1 | 1/1 | 2/2 | 1/2 | 2/2 | 1/1 | 1/1 | 2/2 | 3/3 | 5/5 |
|                 | 0/1 | 1/1 | 1/1 | 3/3 | 2/2 | 1/1    | 2/2 |     |     |     |     |     |     |     |     |

---

## Unit 6 Linear Regression

### Lecture 19: Linear Regression 1 (28/29) 97%

Exercises due Dec 12, 2019 05:29 IST

Problem Scores: 1/1 2/2 1/1 4/4 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 1/1 0/1  
1/1 1/1 2/2 2/2 2/2

### Lecture 20: Linear Regression 2 (40/40) 100%

Exercises due Dec 12, 2019 05:29 IST

Problem Scores: 2/2 3/3 5/5 2/2 1/1 6/6 1/1 1/1 1/1 1/1 1/1 1/1 3/3 1/1 3/3 1/1 2/2  
1/1 1/1 2/2 1/1 1/1

### Recitation 23: Hypothesis Test for Linear Regression

No problem scores in this section

### Recitation 24: Multiple Hypothesis Testing and Bonferroni Correction

No problem scores in this section

### Recitation 25: Ridge Regression

No problem scores in this section

### Homework 10 Linear regression (25/25) 100%

Homework due Dec 12, 2019 05:29 IST

Problem Scores: 2/2 3/3 2/2 5/5 1/1 1/1 3/3 2/2 1/1 1/1 1/1 1/1 2/2

## Unit 7 Generalized Linear Models

### Lecture 21: Introduction to Generalized Linear Models; Exponential Families (37/38) 97%

Exercises due Dec 19, 2019 05:29 IST

Problem Scores: 2/3 1/1 1/1 1/1 1/1 2/2 4/4 4/4 1/1 4/4 3/3 1/1 3/3 1/1 2/2 4/4  
2/2 0/0

### Lecture 22: GLM: Link Functions and the Canonical Link Function (7/9) 78%

Exercises due Dec 19, 2019 05:29 IST

Problem Scores: 1/1 0/0 1/1 1/1 0/1 1/1 2/2 1/1 0/1

### Recitation 26: Poisson and Gamma Generalized Linear Models

No problem scores in this section

### Recitation 27: Hypothesis Test for Logistic regression

No problem scores in this section

### Homework 11 (39/39) 100%

Homework due Dec 19, 2019 05:29 IST

Problem Scores: 5/5 2/2 3/3 1/1 5/5 2/2 3/3 1/1 3/3 3/3 5/5 2/2 2/2 2/2

Final exam

**Final Exam** (40/43) 93%

Final due Dec 24, 2019 05:29 IST

|                        |     |         |     |     |         |     |         |     |         |         |         |     |     |     |     |     |
|------------------------|-----|---------|-----|-----|---------|-----|---------|-----|---------|---------|---------|-----|-----|-----|-----|-----|
| <b>Problem Scores:</b> | 1/1 | 2/2     | 1/1 | 1/1 | 1/1     | 1/1 | 2/2     | 1/1 | 2/2     | 1/1     | 2/2     | 0/1 | 2/2 | 2/2 | 2/4 | 2/2 |
| 2.5/2.5                | 0/0 | 0.5/0.5 | 2/2 | 2/2 | 2.5/2.5 | 1/1 | 1.5/1.5 | 2/2 | 1.5/1.5 | 1.5/1.5 | 1.5/1.5 |     |     |     |     |     |

## (Optional) Unit 8 Principal component analysis

(Optional) Preparation Exercises for Principal Component Analysis (54/54) 100%

due Dec 24, 2019 05:29 IST

**Practice Scores:** 3/3    3/3    2/2    2/2    2/2    1/1    5/5    1/1    1/1    1/1    6/6    3/3    1/1    3/3    3/3    6/6

(Optional) Lecture 23: Principal Component Analysis (20/22) 91%

due Dec 24, 2019 05:29 IST

**Practice Scores:** 1/1 0/1 1/1 1/1 1/1 0/1 1/1 3/3 2/2 4/4 2/2 1/1 1/1 1/1 1/1

(Optional) Recitation 28: Principal Component Regression

No problem scores in this section

Until Next Time

Until Next Time

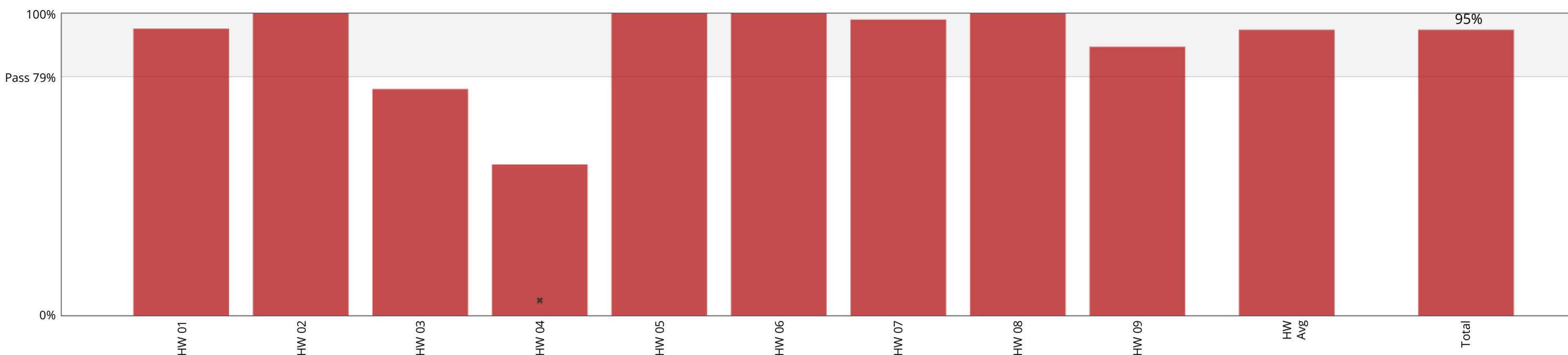
No problem scores in this section

## Exit Survey

[Exit survey](#)

No problem scores in this section

## Course Progress for 'sandipan\_dey' (sandipan.dey@gmail.com)



## Introduction

[About this Class](#)

No problem scores in this section

[How to use this website](#)

No problem scores in this section

[MITx Philosophy Award](#)

No problem scores in this section

[Acknowledgments](#)

No problem scores in this section

## Entrance Survey

[Entrance Survey](#)

No problem scores in this section

## Infinite Cardinalities

[Introduction](#)

No problem scores in this section

[Hilbert's Hotel](#) (8/8) 100%

Practice Scores: 1/1 1/1 3/3 1/1 1/1 1/1

[Size Comparisons](#) (4/4) 100%

Practice Scores: 1/1 1/1 1/1 1/1

[The Real Numbers](#) (11/12) 92%

Practice Scores: 1/1 1/1 1/1 2/2 1/1 0/1 1/1 1/1 1/1 1/1

[Cantor's Theorem](#)

No problem scores in this section

[The Power Set of Natural Numbers](#) (3/4) 75%

Practice Scores: 1/1 1/1 0/1 1/1

[Summary and Further Resources](#)

No problem scores in this section

[Homework](#) (95/100) 95%

Homework due Jun 24, 2020 21:30 IST

Problem Scores: 15/15 15/15 15/15 0/5 20/20 5/5 5/5 10/10 10/10

## The Higher Infinite

[Introduction](#)

No problem scores in this section

[The Higher Infinite](#) (1/1) 100%

Practice Scores: 1/1

[Ordinals](#) (14/16) 88%

Practice Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2 1/1 1/1 0/1 0/1

[Ordinal Arithmetic](#) (7/7) 100%

Practice Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Ordinals as Blueprints](#)

No problem scores in this section

[Paradox](#)

No problem scores in this section

[Summary and Further Resources](#)

No problem scores in this section

[Homework](#) (100/100) 100%

Homework due Jul 1, 2020 21:30 IST

Problem Scores: 25/25 25/25 25/25 10/10 5/5 10/10

## Omega-Sequence Paradoxes

### Introduction

No problem scores in this section

### Omega-Sequence Paradoxes (3/3) 100%

Practice Scores: 1/1 1/1 1/1

### Rational Decision-Making (2/2) 100%

Practice Scores: 1/1 1/1

### Reverse Omega-Sequence Paradoxes (1/1) 100%

Practice Scores: 1/1

### Hat-Problems (7/7) 100%

Practice Scores: 1/1 3/3 1/1 1/1 1/1

### Summary and Further Resources

No problem scores in this section

### **[Bonus: Meet the Experts]**

No problem scores in this section

### Homework (75/100) 75%

Homework due Jul 8, 2020 21:30 IST

Problem Scores: 40/40 20/20 15/30 0/10

## Time Travel

### Introduction

No problem scores in this section

### Time Travel (2/2) 100%

Practice Scores: 2/2

### Time Travel and Physical Law (0/1) 0%

Practice Scores: 0/1

### Free Will (3/3) 100%

Practice Scores: 2/2 1/1

### Summary and Further Resources

No problem scores in this section

### **[Bonus: Meet the Expert]**

No problem scores in this section

### Homework (50/100) 50%

Homework due Jul 15, 2020 21:30 IST

Problem Scores: 30/30 10/20 0/30 10/20

## Newcomb's Problem

### Introduction

No problem scores in this section

### The Problem (0/1) 0%

Practice Scores: 0/1

### Maximizing Expected Value (8/8) 100%

Practice Scores: 3/3 2/2 1/1 1/1 1/1

### In Defense of Two-Boxing

No problem scores in this section

### Causal Decision Theory (8/8) 100%

Practice Scores: 2/2 2/2 1/1 1/1 1/1 1/1

### Summary and Further Resources

No problem scores in this section

### **[Appendix: The Prisoner's Dilemma]** (4/4) 100%

Practice Scores: 1/1 1/1 2/2

### **[Appendix: The Tickle Defense]** (0/1) 0%

Practice Scores: 0/1

### Homework (100/100) 100%

Homework due Jul 22, 2020 21:30 IST

Problem Scores: 30/30 20/20 20/20 30/30

## Probability

## Introduction

No problem scores in this section

## Probability, Subjective, and Objective (1/1) 100%

Practice Scores: 1/1

### Subjective Probability (6/7) 86%

Practice Scores: 1/1 1/1 2/2 1/1 1/1 0/1

### Objective Probability (9/9) 100%

Practice Scores: 1/1 1/1 1/1 2/2 1/1 1/1 1/1 1/1

### The Principle of Countable Additivity (1/1) 100%

Practice Scores: 1/1

### [Optional: The Two-Envelope Paradox] (4/4) 100%

Practice Scores: 1/1 1/1 1/1 1/1

## Further Resources

No problem scores in this section

## [Bonus: Meet the Expert]

No problem scores in this section

## Homework (70/70) 100%

Homework due Jul 29, 2020 21:30 IST

Problem Scores: 20/20 20/20 20/20 10/10

## Non-Measurable Sets

## Introduction

No problem scores in this section

## Measures (23/23) 100%

Practice Scores: 1/1 10/10

## Non-Measurable Sets (5/6) 83%

Practice Scores: 1/1 1/1 0/1 2/2 1/1

## Summary and Further Resources

No problem scores in this section

## Homework (98.5/100) 98%

Homework due Aug 5, 2020 21:30 IST

Problem Scores: 28.5/30 30/30 10/10 10/10 20/20

## The Banach-Tarski Theorem

## Introduction

No problem scores in this section

## The Banach-Tarski Theorem: Three Warm-Up Cases (0/5) 0%

Practice Scores: 0/1 0/1 0/1 0/1 0/1

## The Theorem (0/4) 0%

Practice Scores: 0/1 0/1 0/1 0/1

## Summary and Further Resources

No problem scores in this section

## Computability

## Introduction

No problem scores in this section

## Turing Machines (8/9) 89%

Practice Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1

## Non-computable functions (9/9) 100%

Practice Scores: 1/1 1/1 1/1 1/1 1/1 1/1 2/2 1/1

## Efficiency

No problem scores in this section

## [Optional: The Big Number Duel] (0/2) 0%

Practice Scores: 0/1 0/1

## Summary and Further Resources

No problem scores in this section

## [Bonus: Meet the Expert]

No problem scores in this section

## Homework (80/80) 100%

Homework due Aug 19, 2020 21:30 IST

Problem Scores: 20/20 10/10 20/20 20/20 10/10

## Godel's Theorem

Introduction (1/1) 100%

Practice Scores: 1/1

Godel's Theorem (8/8) 100%

Practice Scores: 5/5 3/3

A Proof of Godel's Theorem

No problem scores in this section

The Philosophical Significance of Godel's Theorem

No problem scores in this section

Summary and Further Resources

No problem scores in this section

[Appendix: Proof of the Lemma] (0/4) 0%

Practice Scores: 0/1 0/1 0/1 0/1

Homework (67/75) 89%

Homework due Aug 26, 2020 21:30 IST

Problem Scores: 20/20 15/15 12/20 20/20

Glossary

Symbols and Concepts

No problem scores in this section

Exit Survey

Exit Survey

No problem scores in this section

You are taking "Final Exam" as a timed exam. The timer on the right shows the time remaining in the exam. To receive credit for problems, you must select "Submit" for each problem before you select "End My Exam".

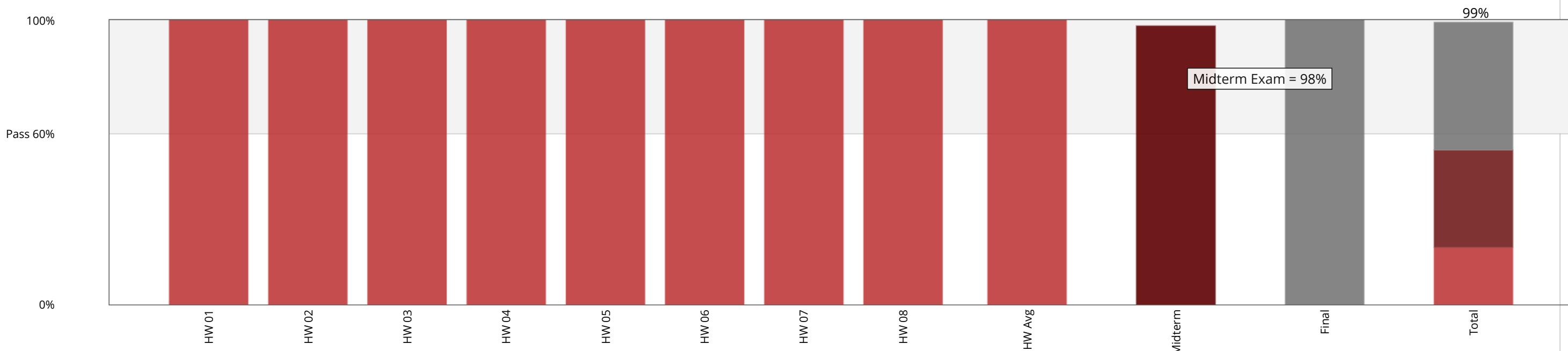
[End My Exam](#)

0:29:12 ⏳

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Week 0: Course Overview & Logistics

#### Welcome to the Course

No problem scores in this section

#### Course Logistics and Reference Materials

No problem scores in this section

#### How To Get Around SCx Courses {TIME 36:29}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

#### Regarding Software for SC0x

No problem scores in this section

### Entrance Survey

[Important Preliminary Survey](#)

No problem scores in this section

## Week 1: Introduction to Supply Chains & Basic Analysis

[Welcome to the Week](#)

No problem scores in this section

[Lesson 1: Introduction to Supply Chain Management {TIME: 53 min}](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0

[Lesson 2: Analytics Basics {TIME: 57 min}](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

[Recitations {TIME: 32 min}](#)

No problem scores in this section

[Sandbox](#)

No problem scores in this section

[Practice Problems](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

[Supplemental Materials for MicroMasters](#)

No problem scores in this section

[First Live Event](#)

No problem scores in this section

[Prerequisite for Graded Assignment in Week 1](#) (1/1) 100%

Practice Scores: 1/1

[Week 1 Graded Assignment](#) (10/10) 100%

Homework due Apr 25, 2018 20:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Week 2: Prescriptive Modeling I: Unconstrained and Constrained Optimization

### Welcome to the Week

No problem scores in this section

### Lesson 1: Unconstrained Optimization {TIME: 55 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

### Lesson 2: Constrained Optimization {TIME: 52 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0

### Recitations {TIME: 1hour 26 min}

No problem scores in this section

### Sandbox

No problem scores in this section

### Practice Problems

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0  
0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0  
0/0

### Supplemental Materials for MicroMasters

No problem scores in this section

### Prerequisite for Graded Assignment in Week 2 (1/1) 100%

Practice Scores: 1/1

### Week 2 Graded Assignment (10/10) 100%

Homework due May 2, 2018 20:30 IST

Problem Scores: 1/1 3/3 1/1 1/1 1/1 3/3

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Week 3: Prescriptive Modeling  
II: IPs, MILPs and Network  
Models

## Welcome to the Week

No problem scores in this section

## Lesson 1: Integer and Mixed Integer Linear Programming {TIME: 55 min}

**Practice Scores:** 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

**Lesson 2: Networks and Non-Linear Programming {TIME: 52 min}**

**Practice Scores:** 0/0 0/0 0/0 0/0 0/0 0/0

### Recitations {TIME: 1 hour 50 min}

No problem scores in this section

## Sandbox

No problem scores in this section

## Practice Problems

**Practice Scores:** 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

[Supplemental Material for MicroMasters](#)

No problem scores in this section

Prerequisite for Graded Assignment in Week 3 (1/1) 100%

Practice Scores: 1/1

**Week 3 Graded Assignment** (10/10) 100%

Homework due May 9, 2018 20:30 IS

**Problem Scores:**    5/5    3.5/3.5    1.5/1.5

## Week 4: Algorithms and Approximations

## Welcome to the Week

No problem scores in this section

### Lesson 1: Algorithms {TIME: 1 hour 3 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

### Lesson 2: Approximations {TIME: 54 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Sandbox

No problem scores in this section

## Practice Problems

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Supplemental Material for MicroMasters

No problem scores in this section

### Prerequisite for Graded Assignment in Week 4 (1/1) 100%

Practice Scores: 1/1

### Week 4 Graded Assignment (10/10) 100%

Homework due May 16, 2018 20:30 IST

Problem Scores: 5/5 5/5

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Week 5 - Off week

## Second Live Event

No problem scores in this section

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Week 6: Midterm Exam

[Prerequisite for Midterm Exam](#) (1/1) 100%

Practice Scores: 1/1

[Instructions for Midterm Exam](#)

No problem scores in this section

[Midterm Exam](#) (137/140) 98%

Midterm Exam due May 23, 2018 20:30 IST

Problem Scores: 35/35 0/0 20/20 0/0 20/20 35/35 0/0 0/0 3/6 6/6 6/6 6/6 6/6 6/6

[Feedback Survey](#)

No problem scores in this section

Week 7: Managing Uncertainty:  
Distributions and Probability[Welcome to the Week](#)

No problem scores in this section

[Lesson 1: Probability Basics and Discrete Distributions {TIME: 1 hour 3 min}](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0

[Lesson 2: Continuous Distributions {TIME: 35 min}](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

[Sandbox](#)

No problem scores in this section

[Practice Problems](#)

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

[Supplemental Materials for MicroMasters](#)

No problem scores in this section

[Prerequisite for Graded Assignment in Week 7](#) (1/1) 100%

Practice Scores: 1/1

[Week 7 Graded Assignment](#) (10/10) 100%

Homework due Jun 6, 2018 20:30 IST

Problem Scores: 1/1 1/1 1/1 3/3 2/2 2/2

## Week 8: Statistical Testing

## Welcome to the Week

No problem scores in this section

### Lesson 1: Statistical Testing I {TIME: 1 hr 23 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

### Lesson 2: Statistical Testing II & Multiple Random Variables {TIME: 58 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Sandbox

No problem scores in this section

## Practice Problems

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Supplemental Materials for MicroMasters

No problem scores in this section

### Prerequisite for Graded Assignment in Week 8 (1/1) 100%

Practice Scores: 1/1

### Week 8 Graded Assignment (10/10) 100%

Homework due Jun 13, 2018 20:30 IST

Problem Scores: 1.5/1.5 1.5/1.5 2/2 5/5

---

Week 9: Regression and  
Simulation Models

## Welcome to the Week

No problem scores in this section

### Lesson 1: Regression Models {TIME: 60 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

### Lesson 2: Simulation Basics {TIME: 41 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0

### Recitations {TIME: 21 min}

Practice Scores: 0/0 0/0

## Sandbox

No problem scores in this section

## Practice Problems

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0

## Supplemental Materials for MicroMasters

No problem scores in this section

### Prerequisite for Graded Assignment in Week 9 (1/1) 100%

Practice Scores: 1/1

### Week 9 Graded Assignment (10/10) 100%

Homework due Jun 20, 2018 20:30 IST

Problem Scores: 2/2 2/2 1/1 3/3 2/2

---

Week 10: Queueing Theory and  
Discrete Event Simulation

Welcome to the Week

No problem scores in this section

Lesson 1: Queueing Theory {TIME: 1 hr 4 min}

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

Lesson 2: Discrete Event Simulation {TIME: 1 hour 54 min}

No problem scores in this section

Practice Problems

Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

Supplemental Materials for MicroMasters

No problem scores in this section

Prerequisite for Graded Assignment in Week 10 (1/1) 100%

Practice Scores: 1/1

Week 10 Graded Assignment (10/10) 100%

Homework due Jun 27, 2018 20:30 IST

Problem Scores: 3.5/3.5 1.5/1.5 0/0 0.5/0.5 0.5/0.5 1/1 1/1 1/1 1/1

## Week 11 - Off week (Wrap-up)

Course Wrap-up

No problem scores in this section

Third Live Event

No problem scores in this section

## Exit Survey

Important Exit Survey

No problem scores in this section

## Week 12: Final Exam

[Prerequisite for Final Exam](#) (1/1) 100%

Practice Scores: 1/1

[Instructions for Final Exam](#)

No problem scores in this section

[Final Exam](#) (180/180) 100%

Final Exam due Jul 4, 2018 20:30 IST

|                 |       |       |     |     |     |     |     |     |     |     |       |       |       |
|-----------------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| Problem Scores: | 25/25 | 20/20 | 0/0 | 5/5 | 6/6 | 6/6 | 5/5 | 6/6 | 6/6 | 5/5 | 10/10 | 10/10 | 10/10 |
| 15/15           | 9/9   | 9/9   | 9/9 | 9/9 |     |     |     |     |     |     |       |       |       |

[Feedback Poll](#)

No problem scores in this section

[Overview](#) [Data](#) [Discussion](#) [Leaderboard](#) [Rules](#)

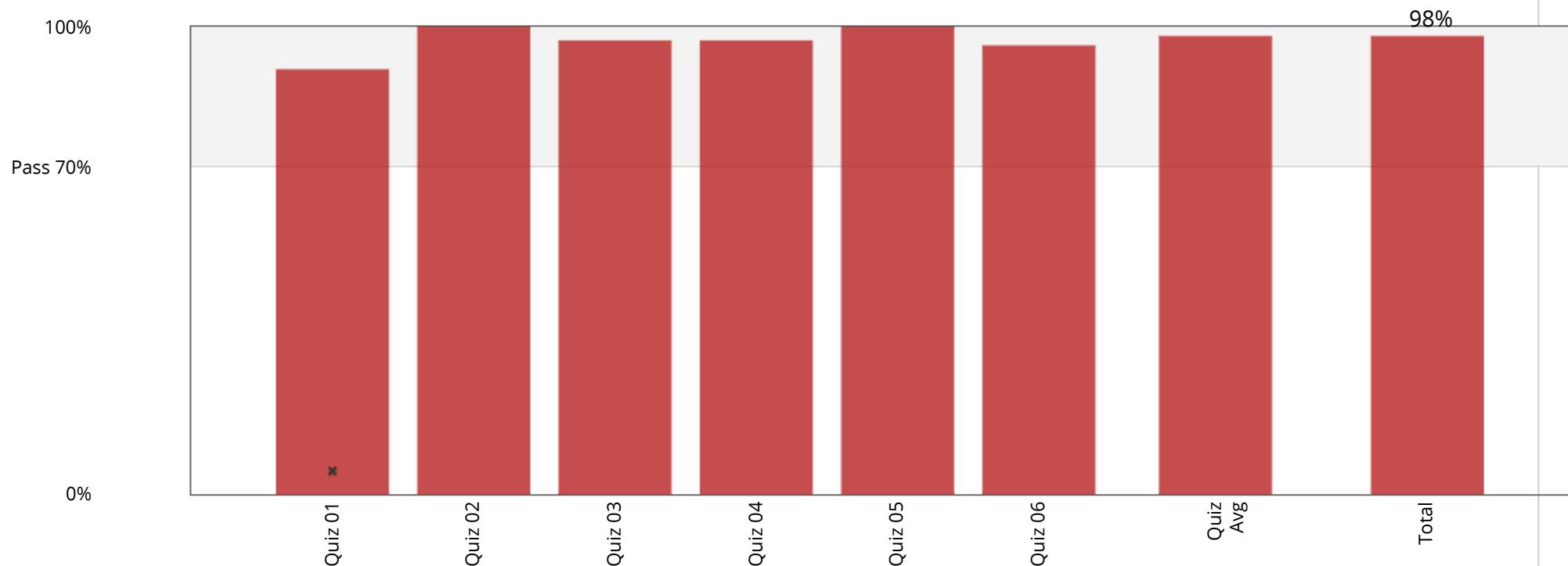
| 107 | ▼ 23  | Le Kern Lim             |  | 0.77350 | 12 | 7y |  |  |
|-----|-------|-------------------------|--|---------|----|----|--|--|
| 108 | ▼ 70  | piotrek                 |  | 0.77349 | 72 | 7y |  |  |
| 109 | ▼ 98  | Alex Stanciu            |  | 0.77349 | 15 | 7y |  |  |
| 110 | ▲ 154 | MPoter                  |  | 0.77346 | 32 | 7y |  |  |
| 111 | ▲ 410 | Alex lankoulski         |  | 0.77342 | 10 | 7y |  |  |
| 112 | ▼ 91  | hedgehog                |  | 0.77336 | 5  | 7y |  |  |
| 113 | ▼ 107 | JK                      |  | 0.77327 | 29 | 7y |  |  |
| 114 | ▲ 691 | Esteban Afonso          |  | 0.77324 | 10 | 7y |  |  |
| 115 | ▲ 365 | Vishwanath Karnik       |  | 0.77322 | 12 | 7y |  |  |
| 116 | ▲ 431 | Aditya Hrishikesh       |  | 0.77316 | 13 | 7y |  |  |
| 117 | ▲ 286 | JohnBMD                 |  | 0.77310 | 25 | 7y |  |  |
| 118 | ▲ 301 | Zuzana Amemiya Plechatá |  | 0.77309 | 13 | 7y |  |  |
| 119 | ▼ 2   | sandipan                |  | 0.77308 | 18 | 7y |  |  |
| 120 | ▲ 204 | Parthiban Gowthaman     |  | 0.77308 | 6  | 7y |  |  |
| 121 | ▲ 310 | Venu Lolla              |  | 0.77305 | 30 | 7y |  |  |
| 122 | ▲ 357 | Madhu M                 |  | 0.77301 | 20 | 7y |  |  |
| 123 | ▼ 57  | 桓                       |  | 0.77296 | 26 | 7y |  |  |
| 124 | ▲ 386 | Elop                    |  | 0.77295 | 3  | 7y |  |  |
| 125 | ▲ 336 | A.D.                    |  | 0.77295 | 2  | 7y |  |  |
| 126 | ▲ 29  | Salima                  |  | 0.77294 | 14 | 7y |  |  |
| 127 | ▲ 238 | amiber14                |  | 0.77294 | 16 | 7y |  |  |
| 128 | ▼ 25  | cannMIIRPHY2021         |  | 0.77293 | 8  | 7y |  |  |



## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

## Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



## Welcome

**Course Information**

No problem scores in this section

**Pre-Course Survey**

No problem scores in this section

---

**Unit 1: Sample Space and Probability****L1.1: Outcomes and Events**

No problem scores in this section

**L1.2: DeMorgan's First and Second Law**

No problem scores in this section

**L1.3: How Many Events**

No problem scores in this section

**L1.4: Sample Spaces**

No problem scores in this section

**L1.5: Probability Rules**

No problem scores in this section

**L1.6: Probability of Empty Set**

No problem scores in this section

**L1.7: Union of Finitely Many Events**

No problem scores in this section

**L1.8: Equally Likely Outcomes**

No problem scores in this section

**L1.9: Setminus and Partition**

No problem scores in this section

**L1.10: Inclusion/Exclusion**

No problem scores in this section

**L1.11: Practice**

No problem scores in this section

**L1.12: Quiz (20/22) 91%**

Quiz

Problem Scores:    4/4    4/4    1/3    5/5    2/2    4/4

---

**Unit 2:  
Independent  
Events, Conditional  
Probability and  
Bayes' Theorem****L2.1: Independent Events**

No problem scores in this section

**L2.2: Examples on Independent Events**

No problem scores in this section

**L2.3: Conditional Probability**

No problem scores in this section

## L2.4: Examples of Conditional Probability

No problem scores in this section

## L2.5: Distributive Laws and Conditional Probability Laws

No problem scores in this section

## L2.6: Two Examples

No problem scores in this section

## L2.7: Bayes' Theorem

No problem scores in this section

## L2.8: Probability of an Intersection

No problem scores in this section

## L2.9: Practice

No problem scores in this section

## L2.10: Quiz (27/27) 100%

Quiz

| Problem Scores: | 2/2 | 3/3 | 1/1 | 2/2 | 2/2 | 6/6 | 1/1 | 3/3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 3/3             | 1/1 | 1/1 | 2/2 |     |     |     |     |     |

---

## Unit 3: Random Variables,

## Probability and Distributions

### L3.1: Random Variables; Discrete versus Continuous

No problem scores in this section

### L3.2: Probabilities and Indicators

No problem scores in this section

### L3.3: Probability mass function

No problem scores in this section

### L3.4: CDF

No problem scores in this section

### L3.5: Joint Distributions

No problem scores in this section

### L3.6: Independent random variables

No problem scores in this section

### L3.7: Practice

No problem scores in this section

### L3.8: Quiz (33/34) 97%

Quiz

| Problem Scores: | 6/6 | 4/4 | 2/2 | 7/7 | 1/1 | 2/2 | 2/2 | 1/1 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 0/1             | 7/7 | 1/1 |     |     |     |     |     |     |

## Unit 4: Expected Values

### L4.1: Expected Values of Discrete Random Variables

No problem scores in this section

### L4.2: Examples

No problem scores in this section

### L4.3: Expected Values of Sums of RVs

No problem scores in this section

### L4.4: Expected Values of Functions of RVs

No problem scores in this section

### L4.5: Variance

No problem scores in this section

### L4.6: Practice

No problem scores in this section

### L4.7: Quiz (33/34) 97%

#### Quiz

| Problem Scores: | 6/6 | 4/5 | 4/4 | 5/5 | 1/1 | 2/2 | 1/1 | 2/2 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2/2             | 2/2 | 2/2 | 2/2 |     |     |     |     |     |

## Unit 5: Models of Discrete Random Variables I

**L5.1: Bernoulli Random Variables**

No problem scores in this section

**L5.2: Binomial**

No problem scores in this section

**L5.3: Geometric Random Variables**

No problem scores in this section

**L5.4: Negative Binomial Random Variables**

No problem scores in this section

**L5.5: Practice**

No problem scores in this section

**L5.6: Quiz (33/33) 100%**

Quiz

| Problem Scores: | 3/3 | 3/3 | 6/6 | 2/2 | 2/2 | 2/2 | 2/2 | 3/3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 3/3             | 2/2 | 3/3 | 2/2 |     |     |     |     |     |

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**Unit 6: Models of Discrete Random Variables II**

**L6.1: Poisson Random Variables**

No problem scores in this section

**L6.2: Hypergeometric Random Variables**

No problem scores in this section

**L6.3: Discrete Uniform Random Variables; and Counting**

No problem scores in this section

**L6.4: Practice**

No problem scores in this section

**L6.5: Quiz (24/25) 96%**

Quiz

| Problem Scores: | 1/2 | 2/2 | 2/2 | 1/1 | 4/4 | 1/1 | 2/2 | 1/1 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2/2             | 4/4 | 2/2 | 2/2 |     |     |     |     |     |



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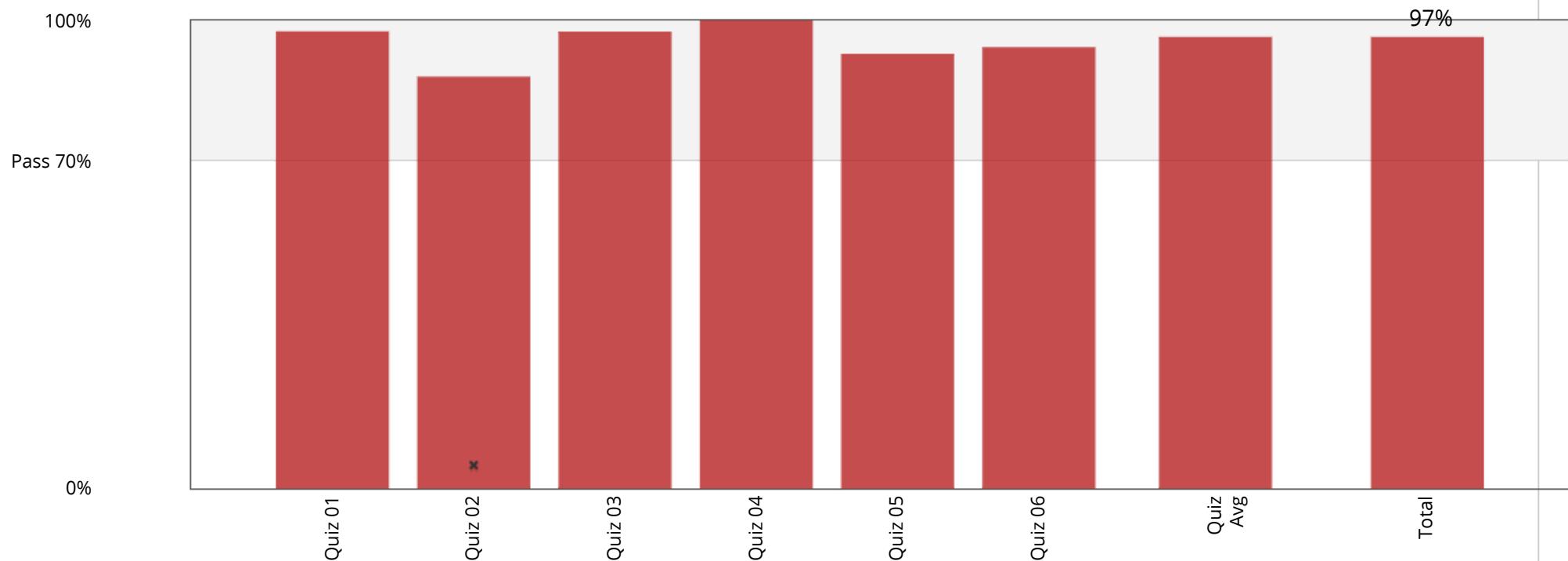




## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

## Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



## Welcome

**Course Information**

No problem scores in this section

**Pre-Course Survey**

No problem scores in this section

---

**Unit 7: Continuous Random Variables****L7.1: Probability Density Functions**

No problem scores in this section

**L7.2: Cumulative Distribution Functions**

No problem scores in this section

**L7.3: Jointly Distributed Continuous Random Variables**

No problem scores in this section

**L7.4: Independent Continuous Random Variables**

No problem scores in this section

**L7.5: Practice**

No problem scores in this section

**L7.6: Quiz (42/43) 98%****Quiz**

|                        |            |            |            |     |     |     |     |     |
|------------------------|------------|------------|------------|-----|-----|-----|-----|-----|
| <b>Problem Scores:</b> | 3/3<br>3/3 | 5/5<br>4/5 | 3/3<br>2/2 | 6/6 | 5/5 | 3/3 | 4/4 | 4/4 |
|------------------------|------------|------------|------------|-----|-----|-----|-----|-----|

## Unit 8: Conditional Distributions and Expected Values

### L8.1: Conditional Distributions for Continuous Random Variables

No problem scores in this section

### L8.2: Expected Values of Continuous Random Variables

No problem scores in this section

### L8.3: Expected Values of Functions of Random Variables I

No problem scores in this section

### L8.4: Expected Values of Functions of Random Variables II

No problem scores in this section

### L8.5: Facts about the Variance

No problem scores in this section

### L8.6: Practice

No problem scores in this section

### L8.7: Quiz (22/25) 88%

Quiz

| Problem Scores: | 2/3 | 1/2 | 2/3 | 2/2 | 1/1 | 1/1 | 1/1 | 2/2 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2/2             | 4/4 | 2/2 | 2/2 |     |     |     |     |     |

## Unit 9: Models of Continuous

## Random Variables

### L9.1: Continuous Uniform Random Variables

No problem scores in this section

### L9.2: Exponential Random Variables

No problem scores in this section

### L9.3: Gamma Random Variables

No problem scores in this section

### L9.4: Beta Random Variables

No problem scores in this section

### L9.5: Practice

No problem scores in this section

### L9.6: Quiz (41/42) 98%

Quiz

| Problem Scores: | 2/2 | 1/1 | 1/1 | 0/1 | 4/4 | 1/1 | 1/1 | 6/6 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 5/5             | 4/4 | 4/4 | 2/2 | 2/2 | 1/1 | 7/7 |     |     |

## Unit 10: Normal Distribution and Central Limit Theorem (CLT)

**L10.1: Normal Random Variables**

No problem scores in this section

**L10.2: Sums of Independent Normal Random Variables**

No problem scores in this section

**L10.3: Central Limit Theorem**

No problem scores in this section

**L10.4: Practice**

No problem scores in this section

**L10.5: Quiz (29/29) 100%**

Quiz

| Problem Scores: | 3/3 | 3/3 | 4/4 | 2/2 | 2/2 | 2/2 | 2/2 | 2/2 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 3/3             | 3/3 | 2/2 | 1/1 |     |     |     |     |     |

---

**Unit 11:**  
Covariance,  
Conditional  
Expectation,  
Markov and  
Chebychev  
Inequalities

**L11.1: Variance of Sums; Covariance; Correlation**

No problem scores in this section

**L11.2: Conditional Expectation**

No problem scores in this section

**L11.3: Conditional vs Independent**

No problem scores in this section

**L11.4: Markov and Chebyshev Inequalities**

No problem scores in this section

**L11.5: Practice**

No problem scores in this section

**L11.6: Quiz (26/28) 93%**

Quiz

| Problem Scores: | 1/1 | 2/2 | 1/1 | 0/1 | 4/5 | 2/2 | 2/2 | 3/3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 2/2             | 3/3 | 2/2 | 4/4 |     |     |     |     |     |

---

**Unit 12: Order Statistics, Moment Generating Functions, Transformation of RVs**

**L12.1: Order Statistics**

No problem scores in this section

**L12.2: Moment Generating Functions**

No problem scores in this section

**L12.3: Transformations of One or Two Random Variables**

No problem scores in this section

**L12.4: Practice**

No problem scores in this section

**L12.5: Quiz (33/35) 94%**

Quiz

| Problem Scores: | 3/3 | 3/3 | 2/2 | 2/2 | 2/2 | 2/2 | 2/2 | 3/3 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 4/4             | 4/4 | 4/4 | 2/4 |     |     |     |     |     |



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# HONOR CODE CERTIFICATE



**Yuchun Ma**

Associate Professor, Department of Computer Science & Technology  
*Tsinghua University*

**Jianping Wu**

Head of Department of Computer Science & Technology  
*Tsinghua University*

**Fenghua Nie**

Director of Online Education Office  
*Tsinghua University*

# Sandipan Dey

successfully completed and received a passing grade in

## 60240013x: Combinatorial Mathematics

a course of study offered by TsinghuaX, an online learning initiative of Tsinghua University through edX.

**HONOR CODE CERTIFICATE**

Issued January 8th, 2015

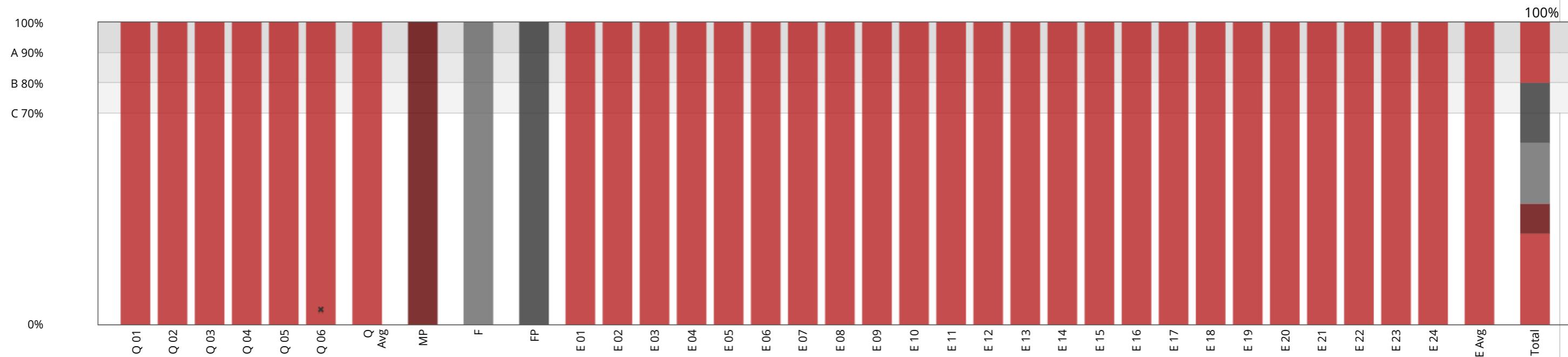
Verify the authenticity of this certificate at

<https://verify.edx.org/cert/699ae4751cd449879c7ba80aa46792a5>

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)

### Your enrollment: Audit track

You are enrolled in the audit track for this course. The audit track does not include a certificate.



### Introduction and Course Information

#### Welcome to Python For Data Science (3/3) 100%

##### Engagement

Problem Scores: 1/1 1/1 1/1

#### Syllabus (5/5) 100%

##### Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1

#### Getting to Know You

No problem scores in this section

#### Discussion: You get points! (1/1) 100%

##### Engagement

Problem Scores: 1/1

#### Check out our class diversity!

No problem scores in this section

## Week 1: Getting Started with Data Science

### Data Science: Generating Value From Data (4/4) 100%

#### Engagement

Problem Scores: 1/1 1/1 1/1 1/1

### The Data Science Process (11/11) 100%

#### Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

### Week 1: Assessment (15/15) 100%

#### Quizzes

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Week 2: (Optional) Background in Python and Unix

### Week Introduction

No problem scores in this section

### Python: Basics (5/5) 100%

Practice Scores: 1/1 1/1 1/1 1/1 1/1

### Python: Key Data Structures (2/2) 100%

Practice Scores: 1/1 1/1

### UNIX

No problem scores in this section

### (Optional) Week 2: Assessment (9/9) 100%

Practice Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Week 3 - Jupyter Notebooks and Numpy

Jupyter Notebooks (5/5) 100%

## Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1

Numpy (8/8) 100%

## Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

Satellite Image Application in numpy (4/4) 100%

## Engagement

Problem Scores: 1/1 1/1 1/1 1/1

Week 3: Assessment (26/26) 100%

## Quizzes

Problem Scores: 1/1

## Week 4 - Pandas

Working with Pandas Part 1 (6/6) 100%

## Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

Working with Pandas Part 2 (6/6) 100%

## Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1

Working with Pandas Part 3 (5/5) 100%

## Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1

Week 4: Assessment (27/27) 100%

## Quizzes

Problem Scores: 1/1

## Week 5 - Data Visualization

[Introduction to Data Visualization](#) (5/5) 100%

Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1

[Matplotlib and Other Libraries](#) (7/7) 100%

Engagement

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1

[Case Studies](#) (3/3) 100%

Engagement

Problem Scores: 1/1 1/1 1/1

[Week 5: Assessment](#) (17/17) 100%

Quizzes

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

## Week 6 - Mini Project Week

[Get Credit for Your Work](#)

No problem scores in this section

[Practice Proctored Exam](#) (0/3)

Practice Scores: 0/1 0/1 0/1

[Mini Project](#) (1/1) 100%

Engagement

Problem Scores: 1/1

[Mini Project Submission](#) (15/15) 100%

MiniProject

Problem Scores: 15/15

## Week 7 - Introduction to Machine Learning

Introduction to Machine Learning. (5/5) 100%

## Engagemen

**Problem Scores:**    1/1        1/1        1/1        1/1        1/1

**Classification** (5/5) 100%

## Engagemen

**Problem Scores:**    1/1        1/1        1/1        1/1        1/1

## Clustering (4/4) 100%

## Engagemen

**Problem Scores:**    1/1    1/1    1/1    1/

## Regression Analysis (3/3) 100%

Engagemen

**Problem Scores:**    1/1    1/1    1/1

**Week 7: Assessment** (47/47) 100%

## Quizzes

## Week 8 - Working with Text and Databases

Working With Databases (3/3) 100%

## Engagement

**Problem Scores:**    1/1    1/1    1/1

Natural Language Processing with NLTK (6/6) 100%

Engagemen

**Problem Scores:**    1/1        1/1        1/1        1/1        1/1        1/1

Twitter - Working with Text (5/5) 100%

Engagement

**Problem Scores:**    1/1    1/1    1/1    1/1    1/1

**Week 8: Assessment** (49/49) 100%

## Quizzes

## Week 9 - Final Project Part 1

[Final Project Overview](#) (4/4) 100%

Engagement

Problem Scores: 1/1 1/1 1/1 1/1

[Week 9: Checkpoint](#) (2/2) 100%

Engagement

Problem Scores: 2/2

## Week 10 - Final Project Part 2

[Final Project Submission](#) (33/33) 100%

FinalProject

Problem Scores: 33/33

[Preparing for the Final Exam](#)

No problem scores in this section

[Final Exam](#) (22/22) 100%

Final Exam

Problem Scores: 1/1

[End of Course Message](#)

No problem scores in this section

# HONOR CODE CERTIFICATE

This is to certify that

## Sandipan Dey

successfully completed and received a passing grade in

### UT.7.10x: Foundations of Data Analysis - Part 1: Statistics Using R

a course of study offered by UTAustinX, an online learning initiative of University of Texas System through edX.



THE UNIVERSITY  
of TEXAS SYSTEM

Steven Mintz

Executive Director  
Institute for Transformational Learning

*University of Texas System*

Phillip D. Long

Associate Vice Provost for Learning Sciences  
Clinical Professor, Educational Psychology & the iSchool

*The University of Texas at Austin*

Michael J. Mahometa, Ph.D.

Statistical Consultant and Manager, Consulting Services  
Department of Statistics and Data Sciences

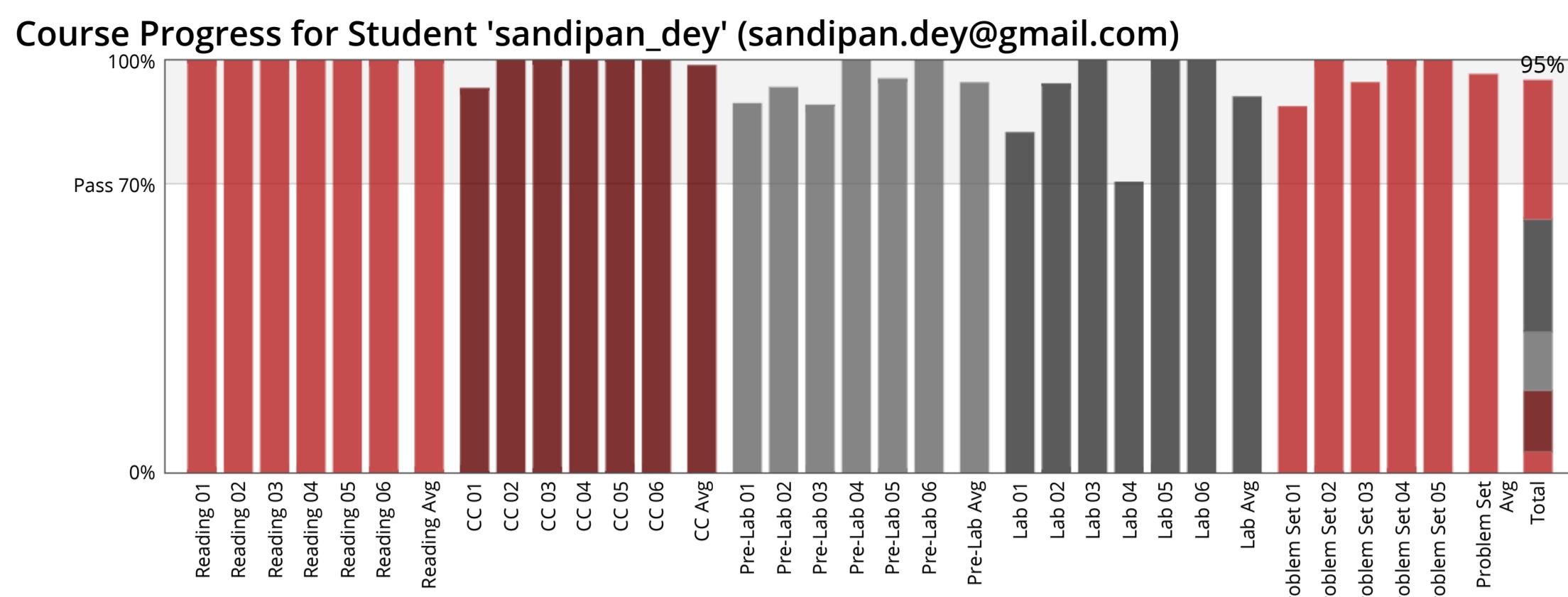
College of Natural Sciences

*The University of Texas at Austin*



HONOR CODE CERTIFICATE  
Issued March 18, 2016

VALID CERTIFICATE ID  
[a74d88001a014eda82f8f333c76d67de](https://courses.edx.org/certificates/a74d88001a014eda82f8f333c76d67de)



## Week 3: Bivariate Distributions

### Readings (1/1) 100%

Reading Check due Mar 15, 2016 23:30 IST

Problem Scores: 1/1

### Lecture Videos (14/15) 93%

Comprehension Check due Mar 15, 2016 23:30 IST

Problem Scores: 4/4 2/3 5/5 3/3

### R Tutorial Videos

No problem scores in this section

### Pre-Lab (26/29) 90%

Pre-Lab due Mar 15, 2016 23:30 IST

|                 |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 0/3 | 4/4 | 2/2 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 2/2 |
| 4/4             | 2/2 | 2/2 | 1/1 | 4/4 |     |     |     |     |     |

### Lab (19/23) 83%

Lab due Mar 15, 2016 23:30 IST

Problem Scores: 2/2 1/1 2/3 0/2 2/2 5/5 7/8

### Problem Set (16/18) 89%

Problem Set due Mar 15, 2016 23:30 IST

Problem Scores: 5/5 1/1 5/6 5/6

## Week 5: Linear Functions

### Readings (1/1) 100%

Reading Check due Mar 15, 2016 23:30 IST

Problem Scores: 1/1

### Lecture Videos (12/12) 100%

Comprehension Check due Mar 15, 2016 23:30 IST

Problem Scores: 2/2 1/1 2/2 1/1 2/2 2/2 2/2

### R Tutorial Videos

No problem scores in this section

### Pre-Lab (29/31) 94%

Pre-Lab due Mar 15, 2016 23:30 IST

|                 |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 3/3 | 3/3 | 3/4 | 2/2 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 2/2 |
| 2/2             | 3/3 | 3/3 | 1/1 | 5/6 |     |     |     |     |     |     |

### Lab (17/18) 94%

Lab due Mar 15, 2016 23:30 IST

|                 |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 1/1 | 1/1 | 1/1 | 0/1 | 0/0 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 1/1             | 1/1 | 8/8 |     |     |     |     |     |     |     |     |

### Problem Set (13/13) 100%

Problem Set due Mar 15, 2016 23:30 IST

|                 |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 1/1             | 1/1 | 1/1 | 1/1 | 0/0 |     |     |     |     |     |     |

## Important Post-

**Course Survey****Post-Course Survey**

No problem scores in this section

**Week 2: Univariate Descriptive Statistics****Readings** (1/1) 100%

Reading Check due Mar 15, 2016 23:30 IST

Problem Scores: 1/1

**Lecture Videos** (38/38) 100%

Comprehension Check due Mar 15, 2016 23:30 IST

Problem Scores: 3/3 6/6 6/6 12/12 3/3 4/4 3/3 1/1

**R Tutorial Videos**

No problem scores in this section

**Pre-Lab** (25/28) 89%

Pre-Lab due Mar 15, 2016 23:30 IST

Problem Scores: 3/3 4/4 2/2 1/1 1/1 1/1 1/1 0/1 1/1  
1/1 1/2 2/2 0/1 7/7**Lab** (26/26) 100%

Lab due Mar 15, 2016 23:30 IST

Problem Scores: 2/2 1/1 2/2 2/2 2/2 1/1 1/1 1/1 1/1  
2/2 11/11**Problem Set** (18/19) 95%

Problem Set due Mar 15, 2016 23:30 IST

Problem Scores: 5/5 3/4 7/7 3/3

**Office Hours****Announcements**

No problem scores in this section

**Archive of Past Office Hours**

No problem scores in this section

**Discussion Board****Discussion Board**

No problem scores in this section

**Discussion Board Guidelines**

No problem scores in this section

**Get the Most Out of the Discussion Board**

No problem scores in this section

**Week 6:  
Exponential and  
Logistic Function  
Models**

**Readings** (1/1) 100%*Reading Check due Mar 15, 2016 23:30 IST*

Problem Scores: 1/1

**Lecture Videos** (18/18) 100%*Comprehension Check due Mar 15, 2016 23:30 IST*

|                 |     |     |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 1/1             | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 0/0 | 1/1 | 1/1 | 1/1 |     |

**R Tutorial Videos**

No problem scores in this section

**Pre-Lab** (30/30) 100%*Pre-Lab due Mar 15, 2016 23:30 IST*

|                 |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 3/3 | 4/4 | 2/2 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 2/2 |
| 2/2             | 1/1 | 4/4 | 1/1 | 6/6 |     |     |     |     |     |     |

**Lab** (12/17) 71%*Lab due Mar 15, 2016 23:30 IST*

|                 |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 3/3 | 1/3 | 0/0 | 2/2 | 0/2 | 6/7 |
|-----------------|-----|-----|-----|-----|-----|-----|

**Problem Set** (26/26) 100%*Problem Set due Mar 15, 2016 23:30 IST*

|                 |     |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 1/1 | 1/1 | 0/0 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 1/1             | 1/1 | 5/5 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 1/1             | 1/1 | 1/1 |     |     |     |     |     |     |     |     |

**Week 1:**  
**Introduction to Data**
**Readings** (1/1) 100%*Reading Check due Mar 15, 2016 23:30 IST*

Problem Scores: 1/1

**Lecture Videos** (9/9) 100%*Comprehension Check due Mar 15, 2016 23:30 IST*

|                 |     |     |     |
|-----------------|-----|-----|-----|
| Problem Scores: | 3/3 | 4/4 | 2/2 |
|-----------------|-----|-----|-----|

**R Tutorial Videos** (27/27) 100%*due Mar 15, 2016 23:30 IST*

|                  |     |     |     |     |     |     |     |     |     |     |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Practice Scores: | 4/4 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 1/1              | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 1/1              | 1/1 | 1/1 | 1/1 |     |     |     |     |     |     |     |

**Pre-Lab** (22/23) 96%*Pre-Lab due Mar 15, 2016 23:30 IST*

|                 |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 3/3 | 3/3 | 1/1 | 2/2 | 1/1 | 1/1 | 0/1 | 1/1 | 1/1 |
| 1/1             | 1/1 | 1/1 | 1/1 | 5/5 |     |     |     |     |     |

**Lab** (17/17) 100%*Lab due Mar 15, 2016 23:30 IST*

|                 |     |     |     |     |     |     |     |     |     |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Problem Scores: | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 | 1/1 |
| 1/1             | 1/1 | 1/1 | 1/1 | 6/6 |     |     |     |     |     |

**Week 4: Bivariate Distributions (Categorical Data)**

**Readings (1/1) 100%***Reading Check due Mar 15, 2016 23:30 IST*

Problem Scores: 1/1

**Lecture Videos (30/30) 100%***Comprehension Check due Mar 15, 2016 23:30 IST*

Problem Scores: 6/6 6/6 4/4 6/6 3/3 3/3 2/2

**R Tutorial Videos**

No problem scores in this section

**Pre-Lab (33/33) 100%***Pre-Lab due Mar 15, 2016 23:30 IST*Problem Scores: 3/3 4/4 2/2 1/1 1/1 1/1 1/1 1/1 6/6  
2/2 2/2 2/2 1/1 6/6**Lab (23/23) 100%***Lab due Mar 15, 2016 23:30 IST*

Problem Scores: 2/2 1/1 8/8 5/5 7/7

**Problem Set (20/20) 100%***Problem Set due Mar 15, 2016 23:30 IST*Problem Scores: 1/1 1/1 4/4 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1**Important Pre-Course Survey****Pre-Course Survey**

No problem scores in this section

**Contact Us****Contact the Team**

No problem scores in this section

**Course Team**

No problem scores in this section

**How To Navigate the Course****Introduction to edX**

No problem scores in this section

**Introduction to the Course**

No problem scores in this section

**Introduction to R and RStudio**

No problem scores in this section



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# HONOR CODE CERTIFICATE

This is to certify that

## Sandipan Dey

successfully completed and received a passing grade in

### UT.7.20x: Foundations of Data Analysis - Part 2: Inferential Statistics

a course of study offered by UTAustinX, an online learning initiative of University of Texas System through edX.



THE UNIVERSITY  
of TEXAS SYSTEM

Steven Mintz

Executive Director  
Institute for Transformational Learning

*University of Texas System*

Phillip D. Long

Associate Vice Provost for Learning Sciences  
Clinical Professor, Educational Psychology & the iSchool

*The University of Texas at Austin*

Michael J. Mahometa, Ph.D.

Statistical Consultant and Manager, Consulting Services  
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*The University of Texas at Austin*

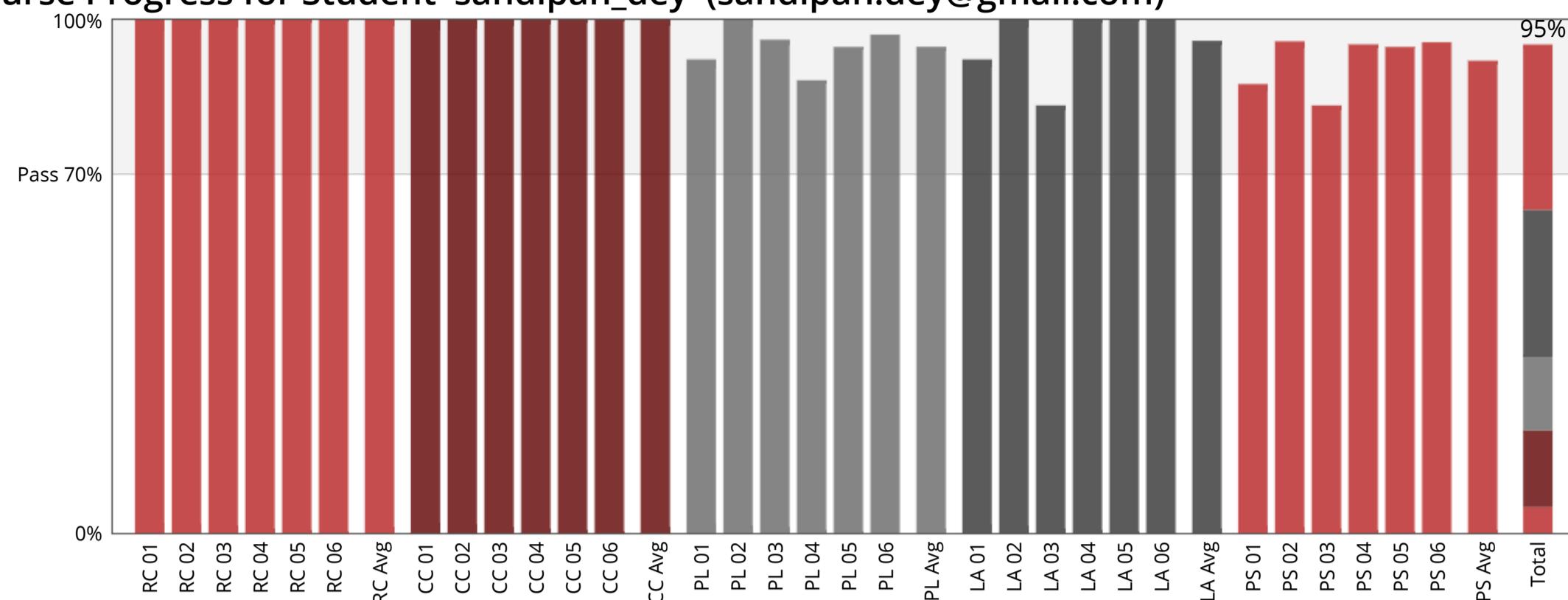


HONOR CODE CERTIFICATE  
Issued May 5, 2016

VALID CERTIFICATE ID

[1d7d5bd3ac9d4990a671126dce3ed1c2](https://courses.edx.org/certificates/1d7d5bd3ac9d4990a671126dce3ed1c2)

## Course Progress for Student 'sandipan\_dey' (sandipan.dey@gmail.com)



### Week 4: Hypothesis Testing (Categorical Data)

#### Readings (1/1) 100%

Reading Check due May 3, 2016 22:30 IST

Problem Scores: 1/1

#### Lecture Videos (28/28) 100%

Comprehension Check due May 3, 2016 22:30 IST

Problem Scores: 1/1 1/1 1/1 4/4 1/1

#### R Tutorial Videos

No problem scores in this section

#### Pre-Lab (36/39) 92%

Pre-Lab due May 3, 2016 22:30 IST

Problem Scores: 3/3 2/4 2/2 1/1 0/1 1/1 1/1 1/1 1/1 5/5

#### Lab (24/26) 92%

Lab due May 3, 2016 22:30 IST

Problem Scores: 1/2 2/2 4/4 7/7 2/2 8/9

#### Problem Set (28/32) 88%

Problem Set due May 3, 2016 22:30 IST

Problem Scores: 1/1 0/1 1/1

### Discussion Board

#### Discussion Board

No problem scores in this section

#### Discussion Board Guidelines

No problem scores in this section

#### Get the Most Out of the Discussion Board

No problem scores in this section

### Office Hours

#### Announcements

No problem scores in this section

#### Archive of Past Office Hours

No problem scores in this section

### Important Post-Course Survey

#### Post-Course Survey

No problem scores in this section

### Week 3: Hypothesis Testing (Two Group Means)

**Readings** (1/1) 100%

Reading Check due May 3, 2016 22:30 IST

Problem Scores: 1/1

**Lecture Videos** (15/15) 100%

Comprehension Check due May 3, 2016 22:30 IST

Problem Scores: 1/1 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

**R Tutorial Videos**

No problem scores in this section

**Pre-Lab** (36/36) 100%

Pre-Lab due May 3, 2016 22:30 IST

Problem Scores: 3/3 6/6 2/2 1/1 1/1 1/1 1/1 1/1 1/1 1/1 5/5  
5/5 3/3 7/7**Lab** (23/23) 100%

Lab due May 3, 2016 22:30 IST

Problem Scores: 2/2 2/2 5/5 5/5 1/1 8/8

**Problem Set** (23/24) 96%

Problem Set due May 3, 2016 22:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1**How To Navigate the Course****Introduction to edX**

No problem scores in this section

**Introduction to the Course**

No problem scores in this section

**Introduction to R and RStudio**

No problem scores in this section

**Contact Us****Contact the Team**

No problem scores in this section

**Course Team**

No problem scores in this section

**Week 2: Hypothesis Testing (One Group Means)****Readings** (1/1) 100%

Reading Check due May 3, 2016 22:30 IST

Problem Scores: 1/1

**Lecture Videos** (27/27) 100%

Comprehension Check due May 3, 2016 22:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1**R Tutorial Videos**

No problem scores in this section

**Pre-Lab** (25/26) 96%

Pre-Lab due May 3, 2016 22:30 IST

Problem Scores: 2/2 3/3 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 2/2  
4/4 0/1 2/2 6/6**Lab** (15/18) 83%

Lab due May 3, 2016 22:30 IST

Problem Scores: 2/2 1/1 0/2 2/3 1/1 1/1 8/8

**Problem Set** (20/24) 83%

Problem Set due May 3, 2016 22:30 IST

Problem Scores: 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 0/1 1/1 1/1 0/1 0/1 1/1 1/1 1/1 1/1 1/1

**Important Pre-Course Survey****Pre-Course Survey**

No problem scores in this section

**Week 6: Correlation and Regression****Readings** (1/1) 100%

Reading Check due May 3, 2016 22:30 IST

Problem Scores: 1/1

**Lecture Videos** (9/9) 100%

Comprehension Check due May 3, 2016 22:30 IST

Problem Scores: 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1

**R Tutorial Videos**

No problem scores in this section

**Pre-Lab** (30/34) 88%

Pre-Lab due May 3, 2016 22:30 IST

Problem Scores: 3/3 4/4 2/2 1/1 1/1 1/1 1/1 1/1 1/1  
0/3 3/4 1/1 10/10**Lab** (22/22) 100%

Lab due May 3, 2016 22:30 IST

Problem Scores: 2/2 1/1 4/4 4/4 2/2 2/2 7/7

**Problem Set** (20/21) 95%

Problem Set due May 3, 2016 22:30 IST

Problem Scores: 3/3 2/2 2/2 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/2 1/1 2/2**Week 5: Hypothesis Testing (More Than Two Group Means)****Readings** (1/1) 100%

Reading Check due May 3, 2016 22:30 IST

Problem Scores: 1/1

**Lecture Videos** (16/16) 100%

Comprehension Check due May 3, 2016 22:30 IST

Problem Scores: 1/1 1/1 1/1 7/7 1/1 1/1 1/1 1/1 1/1  
1/1**R Tutorial Videos**

No problem scores in this section

**Pre-Lab** (36/38) 95%

Pre-Lab due May 3, 2016 22:30 IST

Problem Scores: 1/3 6/6 2/2 1/1 1/1 1/1 1/1 1/1 3/3  
7/7 5/5 7/7**Lab** (27/27) 100%

Lab due May 3, 2016 22:30 IST

Problem Scores: 2/2 1/1 5/5 4/4 4/4 1/1 10/10

**Problem Set** (36/38) 95%

Problem Set due May 3, 2016 22:30 IST

Problem Scores: 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1  
1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1**Week 1: Sampling**

**Readings** (1/1) 100%**Reading Check due May 3, 2016 22:30 IST**

Problem Scores: 1/1

**Lecture Videos** (21/21) 100%**Comprehension Check due May 3, 2016 22:30 IST**

Problem Scores: 1/1

**R Tutorial Videos**

No problem scores in this section

**Pre-Lab** (34/35) 97%**Pre-Lab due May 3, 2016 22:30 IST**Problem Scores: 3/3 2/2 2/2 3/3 1/1 1/1 1/2 2/2 3/3  
4/4 1/1 11/11**Lab** (24/24) 100%**Lab due May 3, 2016 22:30 IST**

Problem Scores: 3/3 4/4 3/3 4/4 1/1 9/9

**Problem Set** (22/23) 96%**Problem Set due May 3, 2016 22:30 IST**Problem Scores: 1/1  
0/1 1/1**Week 0:  
Introduction to  
Data (Optional  
Review)****Readings**

No problem scores in this section

**Lecture Videos**

Practice Scores: 0/0 0/0 0/0

**R Tutorial Videos**Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0  
0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0  
0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0**Pre-Lab**Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0  
0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0**Lab**Practice Scores: 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0  
0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0 0/0

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