

# What is a MOOC?

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Presentation Session on Massive Open Online Courses (MOOCs)  
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# Definition

## Massive Online Open Course

- **On-line**, MOOCs are generally released on a given platform which gathers several courses. The registration to the platforme is often free;
- they often use several tools related to **new web technologies** (videos, interactive pages, ergonomic navigation tools...);
- the course is **simultaneously given** for **several thousands learners** at a fixed period (e.g., “Data Analysis”, J. Leek, JHU : 134 431, “Aléatoire”, S. Méléard, EP : 9 600, “Introduction à la programmation orientée objet en C++”, Chappelier et al, EPFL : 14 140);
- **active cooperation** between learners via forums;
- **wide range of topics**: some are very general (“Statistics one ”), others are highly specialized (“Data management for clinical research ”).



# Some MOOC platforms non exhaustive list, restricted to platforms I have already tested

coursera: <https://www.coursera.org>

- created in 2012, **111 partners** (mostly academics)
- more than **1000 courses** and 11 specialization programs (that gather courses on a common topic); **85 courses in the topic “Statistics and Data analysis”**

The screenshot shows the Coursera website interface. At the top, there is a navigation bar with the Coursera logo and links for 'Cours', 'Spécialisations', 'Institutions', 'À propos', 'Connexion', and 'S'inscrire'. Below the navigation bar is a search bar with the placeholder text 'Rechercher un cours'. On the left side, there is a sidebar with various filters: 'Sur demande', 'Éligible pour' (with sub-options for Certificates, Verifications, and Specializations), and 'Toutes les langues' (with a list of languages including English, Chinese, Spanish, French, Portuguese, Russian, Turkish, Italian, Ukrainian, Afrikaner, Hebrew, Japanese, Arabic, Vietnamese, and Hindi). The main content area displays a list of courses. The first course is 'Université du Maryland, College Park' with the title 'Développer des idées innovantes pour les jeunes entrepreneurs : les premiers pas dans l'entrepreneuriat' by Dr. James V. Green, starting in Feb 23, 2015, and lasting 4 weeks. The second course is 'Université de Californie, San Diego' with the title 'Apprendre à apprendre : des outils mentaux puissants qui vous aideront à maîtriser les matières difficiles' by Dr. Barbara Oakley & Dr. Terence Sejnowski, starting in Feb 23, 2015, and lasting 12 weeks. The third course is 'Université du Colorado' with the title 'Se lancer à la programmation de jeux avec C#' by Dr. Tim "Dr. T" Chambliss, starting in Feb 23, 2015, and lasting 10 weeks. The fourth course is 'L'Université de Chicago' with the title 'Comprendre le cerveau : la neurobiologie de la vie quotidienne' by Peggy Mason, starting in Feb 23, 2015, and lasting 10 weeks. Each course entry includes a small image, the university name, course title, instructor name, start date, and duration. There are also buttons for 'Verified Certificate' and 'Apprenez des mathématiques'.

- courses are given in **29 languages**
- uses its own platform program (not open-source but very well made, simple, easy to navigate and integrating many tools, such as videos, quiz-in-video, quizzes, pages to upload essays...)
- can provide verified certificates of validation (this service is not free)



# Some MOOC platforms non exhaustive list, restricted to platforms I have already tested

Udacity: <https://www.udacity.com>

- created in 2012, **18 partners** (mostly firms, such as Google, Nvidia, facebook...)
- **~ 80 courses**, all oriented toward IT and 5 “nanodegrees”; **13 in the field of “Data Science”** (some of them are DB courses)
- courses are given in English
- uses its own platform (a bit less easy to navigate between the different parts of the course; comprises videos with quizzes inside the video, quizzes and a forum; the non-free version of the course also gives access to reviewed projects)
- can provide verified certificates of validation (this service is not free)

The screenshot shows the Udacity website interface. At the top, there's a navigation bar with 'UDACITY' on the left and 'Nanodegree', 'Catalog', 'Sign In', and 'Sign Up' on the right. Below the navigation bar is a search bar labeled 'Search Course Information'. The main content area is titled 'Nanodegrees and Courses'. On the left side, there are filters for 'CATEGORY' (All, Data Science, Web Development, Software Engineering, Android, iOS, Georgia Tech Masters in CS, Non-Tech Classes) and 'SKILL LEVEL' (New To Tech, Beginner, Intermediate, Advanced). Below these are filters for 'BUILT BY' (Facebook, Google, Salesforce, AT&T, Cloudera). The main content area displays four course cards, each with a Udacity logo icon and a title: 'Introduction to Programming Nanodegree' (Beginner), 'Front-End Web Developer Nanodegree' (Intermediate), 'Data Analyst Nanodegree' (Intermediate), and 'iOS Developer Nanodegree' (Intermediate). Each card includes a brief description of the course.

# Some MOOC platforms non exhaustive list, restricted to platforms I have already tested

edX: <https://www.edx.org>

- created in 2012, **79 partners** (mostly academics but including, e.g., the Linux Foundation, Microsoft)
- **more than 500 courses** and **32 Xseries**; **57 courses** in the field “**Data Analysis and Statistics**”
- mostly in English but some courses are in 6 other languages
- platform based on the open-source program “**Open edX**”, partially developed by Google and also used by the French platform FUN (less flexible and easy to navigate, integrates videos, and quizzes but (as far as I know) no quiz-in-video and no page to upload essays...)

The screenshot shows the edX website interface. At the top, there is a navigation bar with the edX logo, links for 'HOW IT WORKS', 'FIND COURSES', 'SCHOOLS & PARTNERS', 'REGISTER', and 'SIGN IN'. Below the navigation bar, the main content area is titled 'Viewing all 429 courses'. There is a search bar with the placeholder text 'Search for a course' and a magnifying glass icon. The main content area is divided into two columns. The left column is titled 'Featured Courses' and displays three course cards. The first card is for 'CatalyX ILX1' with the subtitle 'Inclusive Leadership Training: Becoming a Successful Leader'. The second card is for 'McGill Body101x' with the subtitle 'The Body Matters'. The third card is for 'St. Margaret's Episcopal School PSYC101x' with the subtitle 'Introduction to Psychology'. The right column is titled 'Refine your search' and contains several filter sections: 'Availability' (Current: 100, Starting Soon: 108, Upcoming: 63, Self-paced: 21, Archived: 108), 'Course Types' (Verified Courses: 201, Part of an XSeries: 28, High School: 46, Professional Education: 4), and 'Subjects' (Architecture: 6, Art & Culture: 33, Biology & Life Sciences: 55, Business & Management: 10, Chemistry: 20, Communication: 10, Computer Science: 20, Design: 4, Economics & Finance: 16, Education: 16). Below the featured courses, there are three more course cards: 'UC BerkeleyX GG101x' (The Science of Happiness), 'HarvardX CS50x' (Introduction to Computer Science), and 'LouvainX Louvel' (Ressources naturelles et développement durable).



# Some MOOC platforms non exhaustive list, restricted to platforms I have already tested

FUN (French platform):

<http://www.france-universite-numerique.fr>

The screenshot shows the homepage of FUN (France Université Numérique). At the top left is the FUN logo, a blue circle with 'FUN' in white. To its right is the text 'FRANCE UNIVERSITÉ NUMÉRIQUE'. Further right are social media icons for Twitter, Facebook, YouTube, and LinkedIn, followed by a search bar with the text 'RECHERCHER...'. Below this is a blue navigation bar with the text 'DÉCOUVRIR, APPRENDRE ET RÉUSSIR'. Underneath is a dark blue menu bar with five items: 'ACTUALITÉS', 'ENJEUX', '18 ACTIONS', 'MOOCS' (highlighted in red), and 'RESSOURCES ET INITIATIVES'. Below the menu bar, there is a breadcrumb trail 'Accueil > MOOCs' and the heading 'MOOCS'. A section titled 'MOOCS PAR DOMAINE D'ÉTUDE' lists three categories: 'Création, arts et design', 'Cultures et civilisations', and 'Économie'. To the right of this section is a box titled 'INSCRIVEZ-VOUS' with a thumbnail image of a course page. At the bottom of the page, there is a small text block: 'Un ensemble d'universités et grandes écoles se sont lancées dans la création de MOOCs. Découvrez tous ces MOOCs, choisissez un domaine d'étude :'. The footer of the page contains a small cartoon character and the text 'Nathalie Villa-Vialaneix | What is a MOOC?'.

- created in 2013, **47 partners**
- **~ 131 courses** which are not organized by topic anymore...
- courses are given in French or in English (few)
- platform based on the open-source program “**Open edX**” which has been customized (e.g., uses DailyMotion instead of YouTube for posting videos)

# Navigating inside a MOOC

coursera

Courses Nathalie Vialaneix ▾



## Initiation à la programmation (en Java)

by Jean-Cédric Chappelier, Jamila Sam



### COURS

**Annonces**

Vidéos

Compléments de cours

Références

Errata

### PRATIQUE

Installation

Quiz

Tutoriels

Exercices conseillés

## Annonces

## Certificats

Bonjour à tous,

L'heure du dernier rendu tardif (=hard deadline=) est donc maintenant dépassée. Nous avons préparé les certificats pour tous ceux qui ont obtenus au moins 75% des points et sommes sur le point de les envoyer (la demande est partie chez Coursera et devrait arriver dans la semaine).

Les chiffres définitifs sont les suivants :  
19'377 ont été inscrits à ce cours, dont 14'999 actifs (ça ne s'invente pas !).  
les vidéos ont été regardées 198,020 fois au total, par 10,851 d'entre vous ; 3'526 ont fait au moins un quiz et vous avez été 2'021 à rendre au moins un devoir noté. Sur ces 2'021, 745 ont obtenu un certificat (37% de réussite) dont 459 (23%) « avec distinction » (pour avoir obtenu plus de 90% des points).

Un grand bravo à tous, participants occasionnels ou fidèles ! Nous vous souhaitons bonne continuation, dans vos apprentissages.  
Et pour ceux qui souhaiteraient refaire ce cours-ci, rendez-vous l'année prochaine aux alentours du 20 septembre.

Très cordialement,  
--  
Jamila et Jean-Cédric

## Prochaines échéances

### Recent Discussions

[Cours d'initiation à la programmation événementielle avec Netbeans](#)  
Last post by khalil (a month ago)

[Notes de cours](#)  
Last post by Jean-Cédric Chappelier (INSTRUCTOR) (a month ago)

[certificat format pdf par e-mail ?](#)  
Last post by MEKEZE KWATCHO Patrick (2 months ago)

[Slides manquants semaine 6 et semaine 7](#)  
Last post by Gaspard Zoos (STAFF) (3 months ago)

[Corrigés des devoirs](#)  
Last post by Gaspard Zoos (STAFF) (3 months ago)

[Browse all discussions »](#)



# Navigating inside a MOOC



## Infos et actualités

FEBRUARY 20, 2015

BONJOUR À TOUS,

La première question du [quiz Statistique](#) présentait une erreur. Aussi, afin de donner à tous la chance d'y répondre correctement, vous disposez d'une tentative supplémentaire pour soumettre ce quiz, soit 3 tentatives au lieu de deux.

Bonne semaine 5

L'équipe du MOOC "Fondamentaux pour le Big Data" de Télécom ParisTech.

FEBRUARY 18, 2015

BONJOUR À TOUS,

Disponible dans le contenu de la semaine 5 du MOOC Fondamentaux pour le Big Data. Joseph Salmon y

## Documents pédagogiques

Transferring data from www.france-universite-numerique-mooc.fr...





# Examples of course outlines

“Data Analysis” (J. Leek, John Hopkins, coursera)

pre-requisites: apparently, none...

- week 1 overview on data analysis and R
- week 2 data management and organizing a data analysis
- week 3 graphics and PCA
- week 4 statistical inference and linear regression
- week 5 ANOVA, GLM, variable selection
- week 6 statistical learning, cross validation, regression trees
- week 7 smoothing, bootstrap, bagging
- week 8 multiple test correction, validation by simulation, summary



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**plus:** quizzes every week and 2 projects with real life and complex data on weeks 3 and 6 (2 weeks are given to give the project back) and evaluate the projects of 3 other students at least  $\Rightarrow$  Be honest, **this cannot be done** if you have no pre-requisites!!

# Material

It is usually composed of:

- **videos** (short ~ 10 minutes, ~ 5/10 for each week) with the teacher, slides, animation on slides, movie...

Erreurs de débutant, Le type boolean [14:08] Help Center ✕

## Erreurs classiques

Le test d'égalité s'écrit `==`, et pas `=` affectation

→ `if (a = 1) // !!!` ← `if (a == 1)`

n'est pas accepté par le compilateur.

00:38 / 14:08



# Material

It is usually composed of:

- **videos** (short ~ 10 minutes, ~ 5/10 for each week) Sometimes, videos are **interrupted by very basic quizzes** very helpful to check that you have well understood the main idea and keep you focused on the video

Erreurs de débutant, Le type boolean [14:08] Help Center ✕

Quels codes compilent et n'affichent que non ?

<p>A:</p> <pre>int n = 1; int p = 2; <input type="checkbox"/> if (n = p) {     System.out.println("oui"); } if (n != p) {     System.out.println("non"); }</pre>	<p>B:</p> <pre>int n = 1; int p = 2; <input type="checkbox"/> if (n == p); {     System.out.println("oui"); } if (n != p); {     System.out.println("non"); }</pre>
<p>C:</p> <pre>int n = 1; int p = 2; <input type="checkbox"/> if (n == p) {     System.out.println("oui"); } if (n != p) {     System.out.println("non"); }</pre>	<p>D:</p> <pre>int n = 1; int p = 2; <input type="checkbox"/> if (n == p) System.out.println("oui"); if (n != p) System.out.println("non");</pre>

Submit Skip



# Material

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- **videos** (short ~ 10 minutes, ~ 5/10 for each week) Sometimes, videos are **interrupted by very basic quizzes** Usually, videos can be downloaded (MP4 format) as well as the slides (HTML or PDF)



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- **videos** (short ~ 10 minutes, ~ 5/10 for each week) Sometimes, videos are **interrupted by very basic quizzes**
- **quizzes**: generally every week, they are short and can be part of the evaluation. They are also more difficult than the basic quizzes included in the videos

## DIMENSION, RANG

On considère une application linéaire  $f$  de  $\mathbb{R}^2$  dans  $\mathbb{R}^3$

Choisissez les affirmations correctes parmi les suivantes.

- $f$  ne peut pas être injective
- $f$  ne peut pas être surjective
- $f$  ne peut pas être bijective
- $f$  est forcément injective

## DIMENSION, RANG

On considère une application linéaire  $f$  de  $\mathbb{R}^3$  dans  $\mathbb{R}^5$ , de rang 2.

Quelle est la dimension du noyau de  $f$  ?



# Material

It is usually composed of:

- **videos** (short ~ 10 minutes, ~ 5/10 for each week) Sometimes, videos are **interrupted by very basic quizzes**
- **quizzes**: generally every week
- sometimes **one or several exercises** are given that are most frequently part of the evaluation. They are marked by i) the platform itself (if it can be tested, as for programs or a cleaned data sets) or ii) by several other students (for reports)

## ▼ Semaine 2 : Structures de contrôle (1) : branchements conditionnels

### ✓ Devoir « Branchements conditionnels »

[Help Center](#)

[View Instructions](#)

#### Due Date

Mon 6 Oct 2014 2:59 PM PDT

If you submit after the due date (but before the hard deadline), your submission score will be penalized 50%.

#### Hard Deadline

Mon 13 Oct 2014 2:59 PM PDT

If you submit any time after the hard deadline, you will not receive credit.

Part	Name	Last Submission	Score	Feedback	
1 / 2	Deviner qui	Sun 21 Sep 2014 1:23 AM PDT	50.00 / 50	<a href="#">View</a>	<a href="#">Submit</a>
2 / 2	Deviner qui en 3 questions	Sun 21 Sep 2014 1:28 AM PDT	50.00 / 50	<a href="#">View</a>	<a href="#">Submit</a>
<b>Total Score</b>		<b>100 / 100</b>			





# Material

It is usually composed of:

- **videos** (short ~ 10 minutes, ~ 5/10 for each week) Sometimes, videos are **interrupted by very basic quizzes**
- **quizzes**: generally every week
- sometimes **one or several exercises**
- additional material (for further concepts), a discussion forum (that I haven't been using much), a wiki (students' material), live meeting, subtitling teams for the videos...



# Evaluation

Most MOOCs deliver **certificates of validation**.

- **basic version**: a given amount of quizzes have been answered properly, sometimes several attempts are allowed (sometimes with a penalty at each new attempt); sometimes, the final mark is a combination of the results to quizzes and the results to projects (partially evaluated by your pairs)

# Evaluation

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- **basic version**: a given amount of quizzes have been answered properly, sometimes several attempts are allowed (sometimes with a penalty at each new attempt); sometimes, the final mark is a combination of the results to quizzes and the results to projects (partially evaluated by your pairs)
- **verified certificates**: part of the MOOC business model is based on these certificates that are charged; they are sometimes corrected by an instructor (or an assistant)



# Some remarks

## Why do I finish a MOOC?

- the program, pre-requisites, requested effort, ... must be designed carefully
- videos must be short (can be watched at spare time)
- videos are preferably interactive (can be watched while doing something else)
- quizzes must force me to come back to the course (preferably to PDF version of the slides)
- frequent assignments with a realistic objective
- synchronization and deadlines are mandatory



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I am not that lazy: the ratio of registered people who have obtained a certificate is about 2/3%...



Thank you for your attention...



... questions?



## A few references

- Villa-Vialaneix, N. (2013) J'ai testé pour vous... un MOOC. *Statistique et Enseignement*, **4**(2), 3-17.
- Special issue of the journal *Statistique et Enseignement*, **La statistique dans le secondaire et retour sur les MOOCs** (2014) vol. **5**(1).
- Bar-Hen, A., Villa-Vialaneix, N. & Javaux, H. (2015) Analyse statistique des profils et de l'activité des participants d'un MOOC. *Revue Internationale des Technologies en Pédagogie Universitaire*. *Forthcoming*.
- Villa-Vialaneix, N. (2015) Note de lecture sur le MOOC "Analyse des données multidimensionnelles de François Husson, Jérôme Pagès & Magalie Houée-Bigot". *preprint*

