Myanmar – UGA
Academic Collaboration proposal
in Numerical Mathematics

UGA
Mandalay
Yangon U.
Maubin
Dagon
Bago
Magwe

28/02/2019

Myanmar–UGA Erasmus+ Proposal
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Part 1 : Introduction

1. Grenoble
2. UGA
3. IM2AG & IMAG
4. Luc CV

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1. History of collaboration
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Part 3 : MIC proposal

1. MIC process and schedule
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Grenoble, city of innovation

- 7.1% of the population works in R&D (2nd in France)
- 5th most inventive city in the world (Forbes 2013)
- Top finalist for the European iCapital Capital of Innovation Award (2014)
Feel the pulse of innovation in the heart of the Alps
An exceptional business and scientific environment

- 5 international research facilities
- 9 national research organisations
- R&D partners
  - Sun Microsystems       STMicroelectronics
  - HP                      SOITEC
  - France Telecom           Xerox...
- A wealth of thriving businesses
  - Over 470 international companies in Grenoble
  - Over 78,000 companies in the Isère area

Synchrotron: particle accelerator
« Y » of Grenoble
East campus : UGA
UGA : a new global university

Université Joseph Fourier
Science, Technology, and Health

Université Pierre-Mendès-France
Humanities, Social Sciences, Business, and Law

Université Stendhal
Literature, Language, and Communications

January 1, 2016: three universities merged to form the Université Grenoble Alpes (UGA)
About the UGA: key figures

- 80 research centers
- 2,500 staff and 3,000 faculty members
- 24 academic departments, schools and institutes
- 45,000 students 13% international
- € 450M annual budget
- A self-contained 175 hectare campus
World-Class Research

The UGA is listed among the world’s top universities

Top 200
Shanghai 2017
France’s 7th leading institution

Top 50 in Geography, Physics, Material Science and Engineering

Top 100 in Nanoscience, Chemistry, Ecology, Clinical Medicine and Mathematics

147th
4th place among the French institutions
World-class research: Our award-winning researchers

Joseph Sifakis
*Computer Science*
2007 Turing Award

Alim-Louis Benabid
*Neurosurgery*
Albert Lasker Prize 2014
Breakthrough Prize 2015

Louis Néel
*Physics*
1970 Nobel Prize

Claude Lorius
*Glaciology*
Humboldt Prize 1988
Prix Balzan 2001
CNRS Gold Medal 2002
Blue Planet Prize 2008

Philippe Cinquin
*Medicine*
2013 CNRS Innovation Medal
2014 finalist, European Innovation Contest
High-quality academics: Undergraduate and postgraduate programs in a wide range of subjects

- Architecture, urban and regional planning
- Art and culture
- Biology
- Business and management
- Communication and journalism
- Earth sciences and the environment
- Economics
- Education
- Engineering and technology
- Humanities and social sciences
- Law and political science
- Languages, literature, and linguistics
- Mathematics and computer science
- Medicine and health sciences
- Physics and chemistry
- Physical education
Notable alumni

- Abdoulaye Wade
  President of Senegal 2000-2012
- André Dussolier
  Actor and comedian
- Daniel Cathiard
  Creator of the cosmetics brand *Caudalie*
- Stéphane Courbit
  Entrepreneur, President *Holding LOV Group*
  (IT, alternative energy, luxury hotels)
- Jeannie Longo
  Winner of 13 world championships and 1 Olympic medal in cycling

She studied French at the UGA:

- Jackie Kennedy
Student athletes

- **Marie Bochet**
  Four-time medalist in alpine skiing at the Paralympic Games in Sotchi

- **Marie Dorin-Habert**
  Bronze and silver medalist in the biathlon at the Vancouver Games

- **Coline Mattel**
  Olympic bronze medalist in ski-jump at the Sotchi Games

- **Pierre Vautier**
  Olympic gold medalist in snowboard cross at the Sotchi Games

15 Grenoble students were world champions in 2015
Our international engagement

**UGA International Fast Facts**

- 650 university partners in 80 countries
- 50 dual degrees
- 3 Erasmus Mundus master’s degrees
- 1000 interns abroad
- 1 centralized office to assist international students, faculty, and staff: ISSO
- A UNESCO Chair for international communication
- One of the oldest university centers for the study of French: CUEF
- 180 different nationalities on campus
- 20 languages taught

International collaboration is one of the keys to the UGA’s excellence.

We maintain and develop international partnerships and projects in all of our key activities: teaching and learning, research, and service.

Our innovations are fueled by our close ties to industry and international business.
IM2AG

IM2AG department

IM2AG

Institut Fourier: research lab in Maths

IMAG: research lab in Computer Science & Applied Maths
IMAG: research building with different labs in:
I.T., Computer Sciences & Applied Mathematics
800 researchers

- LIG
- VERIMAG
- GRICAD
- AMIES
- MAIMOSINE
- LJK
Jean Kuntzmann (1912-1992) was a French mathematician who very early influenced the development of applied mathematics and computer science. -- In 1960, he created the National School of Computer Science and Applied Mathematics of Grenoble.

The Jean Kuntzmann Laboratory is built upon two fields of study: computer sciences and applied maths.

http://www-ljk.imag.fr/index_en.php
Research organization

Other universities

UGA

IM2AG
Maths & CS dpt

CNRS

INRIA

LJK

Verimag

LIG
http://www-ljk.imag.fr/membres/Luc.Biard/

Contact

Luc Biard
Laboratoire Jean Kuntzmann (LJK) - Bâtiment IMAG
Université Grenoble Alpes
700 Avenue Centrale
38401 Domaine Universitaire de Saint-Martin-d'Hères (France)
Luc.Biard@univ-grenoble-alpes.fr
Phone : +33 4 57 42 17 08

Professor at UGA
Researcher at Laboratoire Jean Kuntzmann (LJK) CAGD team CVGI

CV
- Short CV
- English (pdf)
- hdr (pdf)

Research
- Research interests
- Recent Publications
- LJK-bibliography
- HAL-bibliography

Projects
- MSTIC - GeoNor
- Equipe de Recherche Commune CEA-Leti / UJF-LJK Géométrie et Capteurs Being assessed
- MiCaGeo (blanc ANR)

Teaching
- Myanmar collaboration Here
- Licence 1 : Map110-120 Documents ici
- Licence 2 : Mat234 Programme DLST Documents ici
- Licence 3 M&I : Algèbre linéaire pour le Graphique et la CAO Annales ici
- M1 MAI : Géométrie Appliquée Programme MAI Documents ici
http://www-ljk.imag.fr/membres/Luc.Biard/

**Education**
- Master in Research, Mathematics, Toulouse, 1986
- PhD thesis in Computer Sciences, UJF, 1990
- HDR : Qualification to Conduct Research, UJF, 2009

**Experience - recent activities**
- Professor, Lab. Jean Kuntzmann, UGA
- Leader of the team "Geometric Modeling & Approximation", 1998-2006
- In charge of the Master M2P "Image and CAGD", 1998-2006
- Visiting professor at the University of California, Davis, 2007-2008
- In charge of the Master M2P/R "Geometry, Image and CFAO", 2011-2014
- Leader of an associated team "Geometry and Sensors" UJF–CEA, 2011-2014
- Industrial collaborations with companies ELF-EP, TOTAL-FINA-ELF, CEA-LETI
Part 2
----- History of our collaboration (2016 ....)

Zin Zar scholarship 2017-2018

Mandalay U

Bago U

Dagon U

Maubin U

Magwe U

UCSY

YTU

Yangon U

Yangon
Training of Applied Mathematics with Scilab & Python,
August 2018
Myanmar & French systems

FRANCE

Lycée

Baccalauréat

18

L1 MIN-int

L2 MIN-int

L3 MI

Licence

MYANMAR

now (2019)

Matriculation

16

Highschool

Baccalauréat

M. Sc.

Bachelor

future (2021)

Matriculation

18

M. Sc.

Maths

MSIAM

M. C. Sc.
French universities have (more or less) **autonomy** over their programs:

Hcéres: High Council for the Evaluation of Research and Higher Education
independent French administrative authority

**Credit system**: ECTS (**European Credit Transfer and Accumulation System**)

- One year = **60 ects**: (courses are usually 3, 6 credits)
  - Semester 1 = 30 credits
  - Semester 2 = 30 credits
- 1 ects (credit) = 9-10 hours of academic teaching (+ students' personal work)

**Erasmus Program**: European student exchange program

- MIC program: International Mobility of Credits
French system (reforms)

Big changes in IT & Computer Science education in recent years

Kindergarten

Elementary school

Middle school

High school (Baccalauréat)

Futur?

Real world: societal life & companies

Educational system

Traineeships
Internships
collaborations

algo 2004
IT, Python 2017

algo 2015

algo 2015

18

15

11

6
UNE LIGNE POLITIQUE

Axes principaux

- Placer les données scolaires au cœur de la stratégie numérique du ministère
- Enseigner au XXIe siècle avec le numérique
- Accompagner et renforcer le développement professionnel des professeurs
- Développer les compétences numériques des élèves
- Créer de nouveaux liens avec les acteurs et les partenaires de l’école

Actions engagées

- Réforme du collège
- Réforme du lycée : SNT et NSI
- CAPES d’Informatique (agrégation ? ?)
SCIENCES NUMÉRIQUES ET TECHNOLOGIE (SNT)

Méthodologie

- Concepts : Données et informations, algorithmes, langages et programmes, machines interfaces (transversal)
- Notions transversales
  - Programmation (Python ≥3)
  - Éléments d’histoire de l’informatique
- environ 4 semaines par thème

Thématiques

- Internet
- Le Web
- Les réseaux sociaux
- Les données structurées et leur traitement
- Localisation, cartographie et mobilité
- Informatique embarquée et objets connectés
- La photographie numérique
Part 3
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Erasmus+ & MIC program

Erasmus+
International Credit Mobility
---- MIC process and schedule

- **Name of proposal**: MIC
  proposal submitted to the Erasmus programme of the European Union (EU)
- **Duration (if accepted)**: 3 years

- **Myanmar coordinator**: Dr Aye Aye Tun
- **French coordinator**: Luc Biard
- **Budget (requested)**: 106,000 euros

- **Targets and goal of MIC program**: credit exchange between a European university and another foreign university

**MIC schedule**:

- **2019**
  - Submission: February 5th
  - Result: end of June

- **2020**
  - Start of project (if accepted): August 2019

- **2021**

- **2022**
  - End of project: July 2022
Objectives of our collaboration: development of numerical maths and project approaches
Objectives of our collaboration: development of numerical maths and project approaches

Objectives of this MIC proposal:

- **Joint curriculum** in applied mathematics (3 common courses)
- Provide a series of theoretical and **practical hands-on courses** in applied mathematics and numerical computing to undergraduate students of mathematics and computer science, of the same level as those offered at UGA.
- Provide high-level specialized **training for instructors** in Myanmar, who will deliver the courses locally.
- Encourage some Myanmar students in applied mathematics and computer science to enroll in **UGA masters programs**.
Objectives of our collaboration: development of numerical maths and project approaches

Proposal:
1) Development of 3 common courses
   - Course Platform
   - Training missions by UGA teachers
   - E-training on FaceBook
   - Delivery of the Course to Myanmar students by Myanmar faculty
   - Experience feedback + cross validation
   - UGA & Myanmar certification

2) Student mobility in both directions (semester scholarships)

3) Faculty mobility in both directions
----- Partners

**UGA & UFR IM2AG**
- Luc Biard
- Elise Arnaud
- Ibrahim Cheddadi
- Saddek Bensalem

- Bachelor students (E-training)
- Eric Bonnetier
- RTI department
- Yves Markowicz & DLST

**INP**
- Christophe Picard

Support from **EU, Campus France** and **IFB** (French Institute in Yangon)

- **Myanmar MoE**
- **Myanmar BoS**

Mandalay U
Magwe U
Maubin U
Dagon U
Bago U
Yangon U

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Support from EU, Campus France and IFB (French Institute in Yangon)
MAP101 Analysis, Scilab Num Computing
6 credits - 54h 10% of a year

MAP201 Images, Stat & R, Dyn. Systems
6 credits - 54h 10% of a year

INF131 Algo, Python Mini-project
6 credits - 54h 10% of a year

Course 1

Course 2

Course 3

MYANMAR

----- Course description
Numerical softwares (Wikipedia)

**Scilab** is a free and open-source, cross-platform numerical computational package and a high-level, numerically oriented programming language. It can be used for signal processing, statistical analysis, image enhancement, fluid dynamics simulations, numerical optimization, and modeling, simulation of explicit and implicit dynamical systems and (if the corresponding toolbox is installed) symbolic manipulations.

**R** is a programming language and free software environment for statistical computing and graphics supported by the R Foundation for Statistical Computing. The R language is widely used among statisticians and data miners for developing statistical software and data analysis. Polls, data mining surveys, and studies of scholarly literature databases show substantial increases in popularity in recent years.

**Python** is an interpreted, high-level, general-purpose free programming language. Python has a design philosophy that emphasizes code readability, notably using significant whitespace. It provides constructs that enable clear programming on both small and large scales. Python features a dynamic type system and automatic memory management. It supports multiple programming paradigms, including object-oriented, imperative, functional and procedural, and has a large and comprehensive standard library.
Course 1 = MAP101

- Basic analysis
- Introduction to Scilab
- Introduction to Numerical Computing

- Functions
- Derivatives
- Integration
- Linear ODE

- Introduction to Scilab
  - Environment
  - Working with Scilab
  - The Console and the Editor
  - Numbers, Booleans and Strings
  - Arrays
  - Input-output
  - Functions
  - Programming
  - Graphic

- Machine numbers
- Root finding
- Basic interpolation
- Numerical integration
- Euler method
Course 1 = MAP101

- Basic analysis
- Introduction to Scilab
- Introduction to Numerical Computing

--- Course description

Finally, the 64-bits code of \( v = 0.3 \) is

\[
\begin{align*}
  s &= 0 \\
  e &= 0111111101 \\
  m &= 00110011001100110011001100110011001100110011001 \\
\end{align*}
\]

Again, we check if we can recover the real value \( v = 0.3 \) from the code \( s = 0, e = 1021 \) and \( m = 9007199254740992 \):

\[
1 \leq e \leq 2046 \quad \Rightarrow \quad v = (-1)^e \times (2^{52} + m) \times 2^{-1075} = (-1)^0 \times (2^{52} + \frac{252 - 1}{5}) \times 2^{-54}
\]

\[
= \frac{3}{10} - \frac{2}{5}
\]

\[
= 0.2999999999999988977697537484345957636833190991796875
\]

Coding real numbers
## Course description

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<th>Myanmar</th>
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<td>MAP101</td>
<td>Course 1</td>
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<tr>
<td></td>
<td><strong>1 CTD = 1 TP = 1h30</strong></td>
<td><strong>1 CTD = 1 LW = 3h</strong></td>
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<tr>
<td>Functions</td>
<td>4 CTD</td>
<td>1 CTD</td>
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<tr>
<td>Derivatives</td>
<td>4 CTD</td>
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<tr>
<td>Integration</td>
<td>4 CTD</td>
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<tr>
<td>Linear ODE</td>
<td>4 CTD</td>
<td>1 CTD</td>
</tr>
<tr>
<td>Scilab</td>
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<td>4 LW</td>
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<tr>
<td>Machine numbers</td>
<td>1 CTD 2 TP</td>
<td>1 CTD 2 LW</td>
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<tr>
<td>Root finding</td>
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<tr>
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<tr>
<td>Numerical integration</td>
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</tr>
<tr>
<td>Euler method</td>
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<td>2 LW</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td><strong>54h</strong></td>
<td><strong>48h</strong></td>
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</table>
### Course description

**Course 2 = MAP201 (discovery of applied mathematics)**

- **Images**
- **Statistic & Introduction to R**
- **Dynamical systems**

#### Images
- Numerical images
- Pointwise operations
  - contrast enhancement
- Filtering and convolution
  - Blurring
  - Sharpening
  - Image derivatives
  - Contours detection

#### Statistic & R
- Data exploration
- Probabilities
- Statistics
- One Sample tests

#### Dynamical systems
- First order equations
- Second order equations
- System of first order differential equations

**Introduction to R**

Stability, Equilibrium, predator-prey, bifurcation
Course description

Course 2 = MAP201

- Images
- Statistic & Introduction to R
- Dynamical systems

Main mathematical tools

Continuous and discrete convolution

\[ (f * g)(t) \triangleq \int_{-\infty}^{\infty} f(\tau)g(t - \tau) \, d\tau \]

\[ (f * g)[n] = \sum_{m=-\infty}^{\infty} f[m]g[n - m] \]

Numerical images

Contrast enhancement

Blurring

Sharpening

Contour detection
Course 2 = MAP201 (discovery of applied mathematics)

- Images
- Statistics & Introduction to R
- Dynamical systems

**Data exploration**
- Getting started with R
- Opening a dataset
- Vocabulary of statistics
- Summarizing / presenting couples of variables

**Probabilities**
- Random experiments
- Introduction to randomness
- Probability distributions
- Continuous distributions
- Limit theorems

**Statistics**
- Estimators
- Confidence intervals
- Vocabulary of tests

**One Sample tests**
- Test on a Gaussian sample
- Testing particular values
- Goodness-of-fit tests

[https://toltex.u-ga.fr/teaching/STA331/SPLS](https://toltex.u-ga.fr/teaching/STA331/SPLS)
----- Course description

**Course 2 = MAP201 (discovery of applied mathematics)**

- Images
- Statistics & Introduction to R
- Dynamical systems

The data gather results obtained by the students of this course between 2011 and 2015. There are 226 individuals (students). The variables are:
- **group**: in BU (Boston University), GB (Grenoble BIOint), GC (Grenoble, CHBint),
- **lab**: grade at the lab exam, range 0-20,
- **midterm**: grade at the midterm exam, range 0-20,
- **final**: grade at the final exam, range 0-20.

The variables have been renamed **GR**, **YE**, **LA**, **MI**, **FI**. Two are discrete: **GR** and **YE**. Three are continuous: the grades **LA**, **MI**, and **FI**. The overall grade of the course is a weighted average of **LA**, **MI**, and **FI**, with respective weights 0.2, 0.2, 0.6. It is a continuous variable, named **GO**. The students pass the course if their overall grade is 10 or more. This is a binary variable, named **PA**. A code of colors for the groups has been used for graphical representations: red for BU, green for GB, blue for GC.

```r
sta <- read.table("res1115.csv", header=TRUE, sep="",")
n <- dim(sta)[1] # number of individuals
GR <- sta[,1] # group
YE <- sta[,2] # year
LA <- sta[,3] # grade at lab exam
MI <- sta[,4] # grade at midterm exam
FI <- sta[,5] # grade at final exam
GO <- 0.2*LA+0.2*MI+0.6*FI # overall grade
PA <- ifelse(GO>=10, "pass", "fail")
cg3 <- c("red","green","blue")
names(cg3) <- c("BU","GB","GC")
cgall <- cg3[GR] # color by individual
pairs(cbind(LA,MI,FI,GO),pch=19,col=cgall) # pair scatter plots
barplot(table(GR,PA),beside=TRUE,col=cg3) # success per group
barplot(table(PA,YE),beside=TRUE) # success per year
```

The questions bear on the distribution of the overall grades, and on the success rate: do they depend on the group? on the year? Can the overall grade of a student or the outcome (pass or fail) be predicted by other variables?
Course description

Course 2 = MAP201 (discovery of applied mathematics)

- Images
- Statistic & Introduction to R
- Dynamical systems

First order equations
- Generalities
- Specific forms
- Stability and Equilibrium
- Non-linear equations
- Malthus Equation

System of first order differential equation
- Linear systems
- Non-linear systems
- Stability and Equilibrium
- Example with predator-prey
- SIR and SIRS examples

Second order equations
- Linear equation
- Method to solve specific equations
- Solving non linear equations
- Stability and bifurcation
### Course Description

**Course 3 = INF131**

- Algorithmic
- Python
- Mini-project

#### Algorithmic

**Part 1**
- Basic types
- Sequence of statements
- Variables
- Conditional statements
- Loop statements
- Manipulation of sets (or list) of values
- Sub-algorithm: procedure and function

**Part 2 (optional)**

#### Python

- Spyder environment
- Starting with Python
- Linear algebra with numpy
- Graphic with matplotlib

#### Mini-project

- Concrete problem to be solved
- Work in group
- Final presentation in English
- One project among
  - Stat
  - Geometry
  - Dynamical syst
Introduction to algorithmic

The aim of this lecture is to provide basic knowledge in algorithmic.

- We will present the basic definitions and practice of what is the basis of computer coding, independently of any programming language: what are statements, variables, procedures, functions, loops and how can they be manipulated.

- We investigate the essential properties of data structures and algorithms for operating on them; to use these structures as tools to assist algorithm design...

Part 1

- Basic types
- Sequence of statements
- Variables
- Conditional statements
- Loop statements
- Manipulation of sets (or list) of values
- Sub-algorithm: procedure and function

Part 2

- Linked lists, stacks, queues
- Binary trees
- Sequential search, binary search
- Binary search trees, balanced binary search trees
- Graphs and graph algorithms
- Sorting algorithms
### Course description

**Course 3 = INF131**

- Algorithmic
- **Python**
- Mini-project

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<tr>
<td>Using the Console (interactive mode)</td>
<td>Basic programming</td>
<td>Vectors and matrices</td>
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<tr>
<td>Using the Editor</td>
<td>Functions</td>
<td>Concatenation of matrices</td>
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<td>Some Spyder preferences</td>
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<td></td>
<td>String, list, tuple, Dictionary</td>
<td>Display of an array</td>
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<tr>
<td></td>
<td>Class</td>
<td>Save an array to a text file</td>
</tr>
</tbody>
</table>

**Graphic with matplotlib**

- 2D plotting
- MultiFig and subplot
- Working with text
- 3D curve plotting
- Surface plotting
- Level set
- Vector fields
- Mouse acquisition
- Determinant and Inverse
- Resolution of a linear system
- Eigenvalue
- Shape, Nan, Inf
- The class matrix of numpy
Course 3 = INF131

- Algorithmic
- Python
- Mini-project
Course 3 = INF131

- Algorithmic
- Python
- Mini-project

Mini-project

- a concrete problem to be solved
- a teacher instructor
- students are working by group of 3 or 4
- 2 hours of work, twice a week for each group
- each week: meeting with the instructor
- last day: joint presentation with powerpoint in English (15mn) (each participant have to speak at least 3 mn)
https://www-ljk.imag.fr/membres/Luc.Biard/Myanmar/
Login : MyanmarUGA
Password : MyanmarUGA
----- E-training

UGA (luc,...) -> Facebook

UGA students -> Facebook

Myanmar (Zin Zar, ...)

Facebook

Myanmar teachers

Myanmar students

- Session 1
- Session 2
- Session 3
- ...
- etc

(0) : proposal of exercises + solutions
(1) : upload on FB + Myanmar comments
(2) : Work + interaction with UGA students
(3) : ZZ collects results
(4) : ZZ to luc + correction
Exercise 3

Write a Scilab script named exoLoop3.sce that performs the following calculations.
1) Determine the sum of the cubes of all positive integers less than or equal to a given integer \( N \).

\[
S3(N) = 1^3 + 2^3 + 3^3 + 4^3 + \cdots + N^3 = \sum_{k=1}^{N} k^3
\]

2) Determine the sum of the reciprocals (the inverses) of the squares of odd numbers

\[
SR2(N) = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \cdots + \frac{1}{(2N + 1)^2} = \sum_{k=0}^{N} \frac{1}{(2k + 1)^2}
\]

3) Determine the sum of the reciprocals (the inverses) of the factorials

\[
SRF(N) = \frac{1}{0!} + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \cdots + \frac{1}{N!} = \sum_{k=0}^{N} \frac{1}{k!}
\]

4) Assuming that

\[
SR2(\infty) = \sum_{k=0}^{\infty} \frac{1}{(2k + 1)^2} = \frac{\pi^2}{8} \quad \text{and} \quad SRF(\infty) = \sum_{k=0}^{\infty} \frac{1}{k!} = e = \exp(1)
\]
determine the smallest integers \( n_1 \) and \( n_2 \) such that

a) \( |SR2(\infty) - SR2(n_1)| < 10^{-5} \)

b) \( |SRF(\infty) - SRF(n_2)| < 10^{-10} \)

5) Compare the rate of convergence of the two series \( SR2(n) \) and \( SRF(n) \).
Group members PDF files are being shared. Members can download the files for offline viewing.

Member Zin added 6 new photos.

Course 1 *** Session 2 *** Question

Group members can now access PDF files in the group. Members can view and download the files.
Hello, I think "The < sign should be > sign at the No4 of exo 3".

Hello win

Hello win

But the answer can't smaller than $10^{-5}$,

Win

And then at the second part, the answer can't smaller than $10^{-10}$.

Win

But the answer can't smaller than $10^{-5}$,

Win

And then at the second part, the answer can't smaller than $10^{-10}$.

Win

Why it can't be smaller than $10^{-5}$?

Win

WE have $SR2(\text{inf}) = 1.233...$

Win

What? I think $SR2(\text{inf}) = 0.3926991$ if $SR2(\text{inf}) = \% \pi/8$
Myanmar & UGA

Win

Yeah, Sorry
SR2(inf) = 1.2337006
not SR2(inf) = 1.2337006

If it were %pi / 8, you would be right
You are convinced that it is <?

Win

I accept that is <.

Win

WE have SR2(inf) = 1,233....

Win

What? I think
SR2(inf) = 0.3926991 if SR2(inf) = %pi/8

WE have to find a n1 which make the difference between the SR2 and SR2(n1) smaller than 10^-5

Win

I think "I'm misunderstanding"

The SR2 (inf) = (%pi)^2 / 8?

No?
The parents gave their children's name with their ambitions. For example, 

The Name of man is Aung Kyaw. His parents gave him that name with the ambitions to become famous and successful person.

Because the meaning of Aung in Myanmar language is Successful and the meaning of Kyaw is Famous. All the words in the name is only for him.

It is not for his father, mother and family. And sometime the parents gave the name of their baby with the ambition to become more healthy or stronger.

For example, the name of boy is Tan Chaung. The ambition of that name is to become healthy and stronger.

Because the meaning of Tan Chaung is stronger and healthy.
Training by UGA teachers
6 weeks per course + 2 weeks (algo)

8 Myanmar students
(one semester = 5 months)

5 Myanmar teachers
(one week, one per university)

3 UGA students
(2 months)
For each course:

1. Course material is deposited on Platform by UGA team
2. Appropriation of the course materials by Myanmar teachers
3. Training of Myanmar faculty by UGA team (6 weeks per course + 2 weeks algo)
4. E-training on Facebook with UGA students
5. Delivery of the Course to Myanmar students by Myanmar faculty
6. Experience feedback on the Course + cross validation
7. If feedback satisfactory, delivery of Course with UGA & Myanmar certification

Rule: each course should represent 10% of a year in Myanmar curriculum
**Planning**

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</table>

S2 (Myanmar)  S1 (Myanmar)  S2 (Myanmar)

**MIC Results**

- C0, C1 platform
- RTI
- C1 e-training

**C0, C1 training**

- 2 weeks + 2 weeks

**C1 training**

- 4 weeks

**C1 delivery**

**C1 feedback**

**C1 certified**

**C2a platform**

**C2b platform**

**C2c platform**

**C2a training**

- 2 weeks

**C2b training**

- 2 weeks

**C2c training**

- 2 weeks

**C2 e-training**

---

**C0 platform**

Course material deposited on Platform by UGA team

**C0 training**

Training of Myanmar faculty by UGA team

**C1 platform**

Course material deposited on Platform by UGA team

**C1 training**

Training of Myanmar faculty by UGA team

**C1 e-training**

E-training on Facebook with UGA students

**C1 delivery**

Delivery of the Course to Myanmar students by Myanmar faculty

**C1 feedback**

Experience feedback on Course 1

**C1 certified**

If feedback satisfactory, delivery of Course with UGA & Myanmar certification
Some organization points

- **Where?** Each training is centralized (for all Myanmar teachers) in one university.

- **Local teams**: Each university should set up a team of maths teachers dedicated to numerical mathematics: the "numerical team".

- **How many teachers?** For efficiency, the whole numerical team of each university should attend all trainings (in order to help each other).

- **For which students?** New specific bachelor curriculum in each university?

- **Experience feedback & cross validation**: By email and videoconference?

- **Student Mobility**
  - Depends on the Myanmar universities. --- Choice based on results in the new course?
  - Students of final year of bachelor program?

- **Teacher Mobility**
  - Depends on the Myanmar universities. --- Teachers involved in the new courses?
Summary

**UGA**
- Platform of courses
- UGA visits
- Student exchanges
- E-training
- Master Sc.

**Myanmar**
- Training missions
- Teachers
- Lab works
- Mini projects & work in group
- New courses
- Students

**technical & attitude skills**
- Scilab « R »
- Python
- Lab works
- Training missions
- Teachers
- Students

**Myanmar institutions**
- Ministry of Education Agreement
- Board of Study Agreement
--- Summary ...

- English language
- Computer equipment: seems OK
- Web connection
- Project approach: from a problem to a solution
- Validation and Agreement of new courses
- English language
- Computer equipment: seems OK
- Web connection
- Project approach: from a problem to a solution
- Validation and Agreement of new courses

→ Laptops for teachers of each « numerical team » who will prepare the courses at home
→ official agreement for EU from the Myanmar Board of Study
→ official agreement for EU from the Myanmar Ministry of Education
• English language
• Computer equipment: seems OK
• Web connection
• Project approach: from a problem to a solution
• Validation and Agreement of new courses

→ Laptops for teachers of each « numerical team » who will prepare the courses at home
→ official agreement for EU from the Myanmar Board of Study
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Thanks for listening!