Computer Programming (CS101)
Autumn 2014

(A Manual for TAs)

Prepared by
Firuza Aibara

Mentored by
Mr. Nagesh Karmali

Course Instructors
Prof. Deepak B. Phatak
Prof. Supratik Chakraborty

IIT Bombay

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Note on Academic Dishonesty

To gain unfair advantage in a competitive situation by breaking rules, is unfair to others and self. Academic honesty is an important code of ethics for a highly developed society and nation. Academic dishonesty can occur in various forms:

1. **Plagiarism:** The adoption or reproduction of original creations of another author (person, collective, organization, community, or other type of author, including anonymous authors) without due acknowledgment.

2. **Fabrication:** The falsification of data, information, or citations in any formal academic exercise.

3. **Deception:** Providing false information to an instructor, concerning a formal academic exercise, e.g., giving a false excuse for missing a deadline, or falsely claiming to have submitted work.

4. **Cheating:** Any attempt to give or obtain assistance in a formal academic exercise (like an examination) without due acknowledgment.

5. **Bribery (or services for a favour):** Giving assignment answers, exam answers or quiz answers for money or for any other favour. Changing grades or marks in return for money of for any other favour. Giving undue advantage to any student in return for money or for any other favour.

6. **Sabotage:** Acting to prevent others from completing their work. This includes cutting pages out of library books, or willfully disrupting the experiments of others.

7. **Professorial misconduct:** Professorial acts that are academically fraudulent, amount to academic fraud and/or grade fraud.

8. **Impersonation:** Assuming a student's identity with intent to provide an advantage for the student.

Source: `http://en.wikipedia.org/wiki/Academic_dishonesty`

If anybody is suspected to be guilty of breaking the code of ethics, the onus will be on her/him to prove her/his innocence.

Those proved to be guilty of breaking the code of ethics will be meted out the severest form of academic punishment, including, if necessary, suspension from the Institute.

Contents

List of Figures

List of Tables

1 CS101 Course Introduction and Methodology

The course covers efficient programming in high level languages like C and C++. This course will develop programming skills, and will help them solve day to day engineering, science, and technology related problems.

1.1 Topics Covered in the Course (Tentative)

The following topics are covered in the course. There will be some changes in the title.

1. Introduction to Programming
2. Rules of the game
3. Basic features of C++
4. Conditional Execution
5. Iterative Algorithms
6. Iterative Solutions
7. Functions in C++
8. Arrays
9. Applications of two-dimensional arrays
10. Searching for values in arrays
11. Strings
12. Structures
13. Files
14. Object Oriented Programming / Classes

1.2 Conduct of the Course

The course consists of pre-recorded lectures which the students need to watch before the class session schedule. It will be conducted using the edX platform and all TAs should get familiar with it. The classroom session will be more of problem solving and discussion rather than mere delivery of lecture. Apart from this, the course has practice lab sessions, makeup lab sessions, and weekly quizzes. A student needs to perform all the mentioned activities. More details are given below.

1.2.1 Lab handouts

A lab handout contains 3 to 4 program questions with the solutions, based on the topics covered during the previous weeks lecture. The purpose of this lab handout is to familiarize the students with different issues like, problems that can be solved using programming, style of coding, using the correct syntax, and method for coding, etc.. This helps the students in tackling varied problems by enforcing on style and methodology in coding for different and unseen areas. Every lab requires solving problems based on certain concepts covered in the class sessions.

1.2.2 Quizzes

Quizzes will be conducted twice every week i.e. Tuesday and Thursday from 08:30 hrs to 09:25 hrs (Quiz1-08:30hrs to 08:50) and (Quiz2-09:00 to 09:20). The quiz questions/programs are based on the same topic covered in the lab handout. The students are supposed to answer the quizzes / write programs, and submit on edX Platform. Quizzes are scheduled every week, so that the student develops a better understanding and their knowledge and level of understanding can be continuously determined.

1.2.3 Mid-Semester and End-Semester Exams

Mid-Sem and End-Sem exams will be conducted online and on the dates are fixed by the institute. They are conducted in the middle and end of the semester, respectively. Mid-Semester results help in changing the way the course has been taught. The Course incharge can choose specific topics not clear to many students, and target those concepts which are not clearly understood. This can help in changing the pace of the course. Feedback gathered from the quizzes and exams not only help in improving the teaching style of the current course, but also helps in the future course taken by the same course in-charge.

1.2.4 Project

A student has to undertake a project in this course. In this the student explores the subject and learns more than what he/she would have done during the normal course. This benefits the students in thinking professionally, and prepares them to tackle real-life problems. The objective is to prepare them for the professional world.

1.3 Course Schedule Autumn 2014

Large number of students enroll for this course, hence the students are divided into 2 slots, i.e. Slot 6 and Slot 11. Lectures are conducted twice a week for both the slots. The course commences from Tuesday, 22 July 2014. The 1st lab session i.e. Zeroth lab will be conducted on Monday, 28 July 2014. This lab will be conducted to familiarize the students with simple computer concepts, 'Ubuntu' Operating System, linux scripting commands, edX platform for submitting quizzes, / project, and finally revising the concepts taught in the lecture by the course in-charge, the previous week.

1.3.1 Course Slot and Venue

Course No.	Div.	Department	No. of Stud.	Lecture Slot	Lecture Venue	Quiz Slot	Quiz Venue
CS101		1st Yr M. Sc(MA + ASI)	67	11A, 11B	Hall 1	3C	OSL, NSL Annex.
	D1	CL, CS	211 **(278)**				
		1st Yr GS + GP	55	6A, 6B		4B	
	D3	ME, EP, CH	212 **(267)**				
		Total	**545**				

Table 1: Course Slot and Venue

1.3.2 Lecture and Quiz Timings

Day / Time	**Mon**	**Tue**	**Wed**	**Thu**	**Fri**	**Sat**	**Sun**
08:30		Quiz Slot 4B		Quiz Slot 3C			
09:00							
09:30							
10:00							
10:30							
11:00			Lecture Slot 6		Lecture Slot 6		
11:30							
12:00							
12:30							
13:00							
13:30							
14:00							
14:30							
15:00							
15:30		Lecture Slot 11			Lecture Slot 11		
16:00							
16:30							
17:00							
17:30							
18:00							
18:30							
19:00							
19:30							
20:00	Lab	Lab	Lab	Lab	Lab	Make-up Lab	Make-upLab
20:30							
21:00							
21:30							

Table 2: Lecture/Quiz/Lab Timings

D3 +GS+GP are allocated to Tuesday(Slot 4B) and D1+M.Sc(MA+ASI) are allocated to Thursday(Slot 3C) for quizzes.

1.3.3 Marks Allocation

Activity	%
Mid Semester	15
End Semester	20
Quizzes	35
Projects	30
Total	100

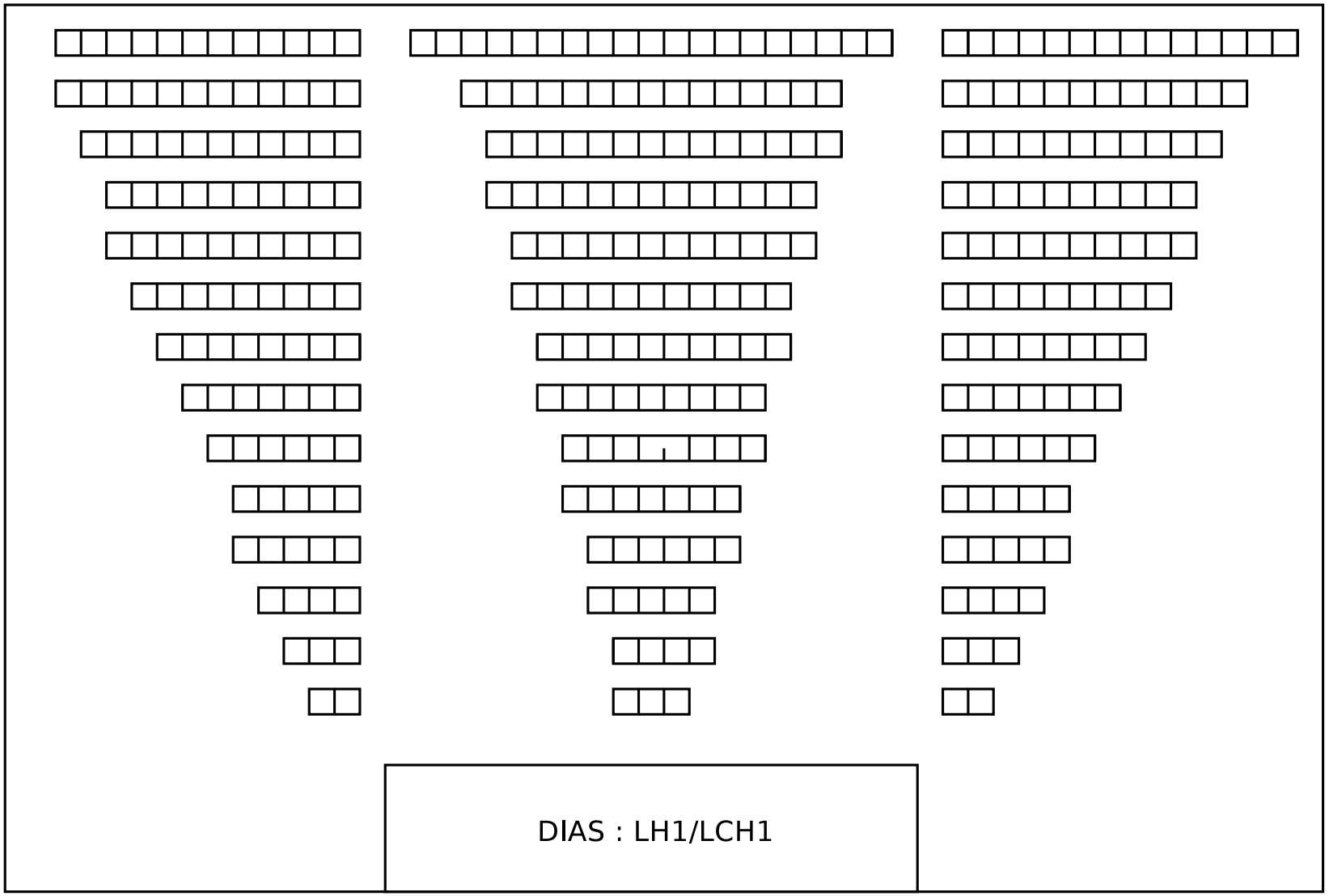
Table 3: Marks Breakup(**To Discuss**)

1.3.4 Important Dates

Day	Date	Event
Monday	21/07/14	Course commences
Sunday	07/09/14	Mid Semester Examination
Sunday	14/09/14	Mid Semester Examination
Friday	07/11/14	Last day of course
Sunday	09/11/14	End Semester Examination
Sunday	23/11/14	End Semester Examination
Wednesday	03/12/14	Last Date for Grade Submission

Table 4: Important Dates

1.3.5 Seating Plan of Hall 1



1.3.6 Seating Plan of OSL Lab, Mathematics Department

Will put here

1.3.7 Seating Plan of NSL Annex, Old CSE Bldg.

will put here

2 Management of the Course

There are 67 Teaching Assistants for the course. To run this large class size (545 students) course, some students from B. Tech, M.Tech, and PhDs are allocated TA duty in large numbers. These TAs are divided into four teams, i.e. Senior TAs (STAs), Consulting Lab TAs (CLTAs), Quiz-Project TAs (QPTAs), Lecture Notes TAs (LNTAs), and Web TAs (WTAs). One or two coordinating TAs are chosen, who are involved in managing all the TAs and the course. Work is assigned team wise, by the coordinating TA who is a Senior TA, to the other TAs. The responsibility of each team is explained in section 4, under the title Work Allocation to TAs.

Maximum number of TAs are allocated as Consulting Lab TAs (CLTAs). They are divided into a number of sub groups, each of which is headed by one STA belonging to M. Tech II. An example is given in section 3, under the title, TA Allocation. CS101 Students are divided into 5 different batches for lab sessions i.e. from Monday to Friday (each no_of_Students / 5). Lab sessions are held every day. Saturday and Sunday are make-up labs i.e. for students who could not complete the task during the regular lab session (on a weekday). Consulting sessions are also held on Saturday and Sunday. 2 STAs and 8 CLTAs are assigned duty of monitoring the students during lab hours.

3 Tentative TA and Student Allocation

3.1 TA Allocation

Category	**No. Allotted**
CLTA	40
STA	10
QPTA	10
LNTA	4
WTA	3
Total	**67**

Table 5: TA Allocation

3.2 Possible Grouping Configuration

3.2.1 Based on Last Digit of Roll Number

This course is elected by the First Year students of different departments. Interaction of students of one department with the students of other departments helps them learn and understand different concepts and also make them aware of different task and working of each department. By interacting with different people, the thinking style and problem solving strategies improve. Thus, it should be ensured that each lab group should have students of different departments. This is being ensured by grouping them into different batches based on the last digits of their roll numbers.

Day	Students with last digit of roll number
Monday	1 or 0
Tuesday	2 or 9
Wednesday	3 or 8
Thursday	4 or 7
Friday	5 or 6

Table 6: Grouping Students based on last digit of roll number

3.2.2 Based on Tutorial Batch

The students on the other hand can also be grouped based on the tutorial batch they are present in. The first year students are grouped into tutorial batches by the institute for performing a group activity. Being their first year in IIT, they would not have interacted with anyone else as much as they would have done with the tutorial batch. Hence, they can be grouped based on the tutorial batch.

4 Work Allocation to TAs

The chart given below explains the distribution of TAs into different groups and their reporting mechanism. Their work and responsibilities are explained in detail.

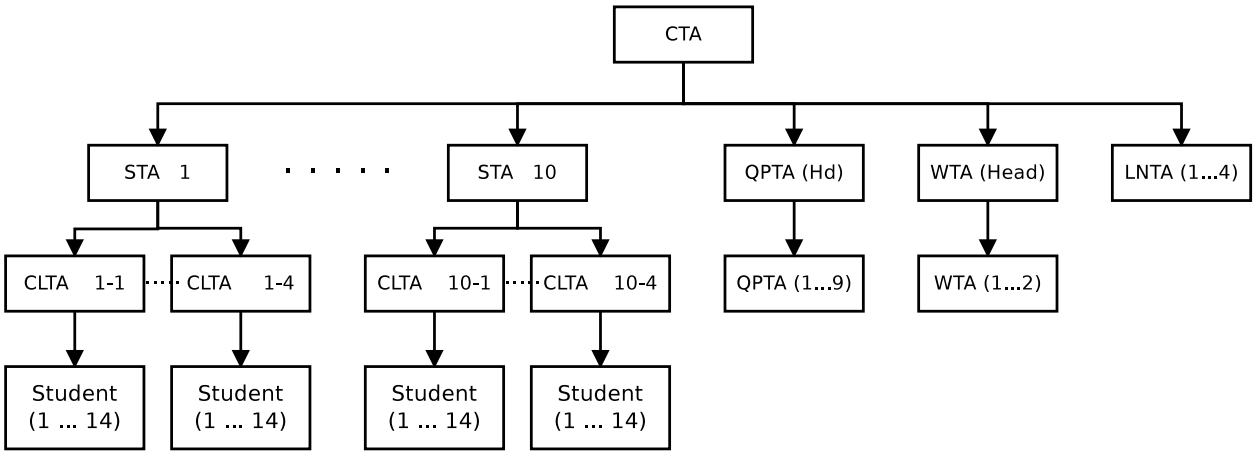


Figure 1: TA Hierarchy

4.1 Coordinating TA(CTA)

The Coordinating TA is responsible for assigning tasks to the STAs, CLTAs, WTAs and QPTA(Head). They are also responsible for holding meetings and conveying information to the all the TAs and the Course in-charge. They need to ensure that the work is carried out without any problems. If some problem arises, the problem should be solved and the course in-charge should be informed immediately.

4.2 Senior Teaching Assistants (STAs)

The STAs should ensure a smooth run of the lab. Each STA will be in charge of 4 CLTA. They should solve queries which are asked by the student or CLTA, and guide them accordingly. They should also monitor the work done by CLTA and send weekly reports / ratings to the Coordinating TA. Note:- If STA is unable to attend the lab session on the allotted day, it is the duty of the STA to inform the coordinating TA and also arrange an alternate STA for the students.

4.3 Consulting Lab Teaching Assistants (CLTAs)

Each CLTA is assigned 14 students whom he/she has to govern and guide them during lab sessions. They need to confirm whether the students understand the programs given in the lab handouts, answer queries relating to the subject / handout and ensure that all problems that arise in the lab are solved. If the CLTA is unable solve queries, then STA should be consulted. They are also responsible for evaluating the Lab assignments which a student solves during the stipulated lab hours or during the make-up lab on Saturday and Sunday. They should rate the students, after they have solved the lab assignment and also considering the students participation during the lab hours. Programs can be evaluated by checking the logic and efficiency of the program and the comments written for the same. These ratings should be sent to the respective STA. CLTA should also motivate the students by advising them to modify the program in the lab handout, accordingly to generate a different program and output.

4.3.1 Lab handouts

Lab handouts contain programs and their solutions based on the topics taught in the lectures. These are to be prepared with sample solutions for the students to practice. These handouts should be sent to the team leader, who in-turn after checking and compiling will be sent to the coordinating TA, and then to the web team after approval, so that the students can access them and practice during lab sessions. Note:- If a CLTA is unable to attend the lab session on the allotted day, it is the duty of the CLTA to inform the coordinating TA and also arrange an alternate CLTA for the students.

4.4 Lecture Notes Teaching Assistants (LNTAs)

The work of LNTAs will be mostly related to the building of course notes. This freshly prepared notes will have all the essence of live discussion on problem solving in the class for all the topics.

4.5 Quiz and Project Teaching Assistants (QPTAs)

4.5.1 Lab Quizzes

Lab quizzes contain different type of questions (MCQ, Drag and Drop, Write programs) which is based on the lecture held the previous week. The quiz questions along with their model solutions should be sent to the team leader, who in-turn after checking and compiling will send to the coordinating TA and then to the web team after approval.

4.5.2 Mid Semester and End Semester

Model questions and their solutions for mid semester and end semester exams have to be prepared with different and efficient solutions, well in advance with the marking scheme. These solutions should be sent to the team leader of this team, who in-turn after checking and compiling will send it to the coordinating TA, and then to the web team after the approval.

4.5.3 Projects

In the second half of the semester, all the students need do a project. The project team will be their lab group. They need to utilize the concepts that have been taught and complete the project in due time. The project can be built using two different approaches:

a) Building Project from Scratch The students need to do a project right from scratch. Usually, a list of topics is given by the course instructor and the students choose from the list. They then start developing the project.

b) Build on Existing Open Source Project Instead of developing the project from scratch, an existing open source project is taken as an example when the course commences. This open source project is then extended as the course progresses. This extended project will then be given to all the students to build on the project and add some new functionality. A team leader is chosen from every team and he/she is responsible for smooth project development. The CLTAs need to be in constant touch with the team leader and also with the entire team. Daily diaries are maintained by every individual of the group. A combined concise diary is submitted to the course instructor at the end of the semester. Note:- The work is assigned by the team leader i.e. QPTA (head). The work normally involves preparing question and answers exams/quizzes. After completion of the work by the members of the team, the solutions should be sent to the QPTA head. The QPTA team leader should send the solutions to the coordinating TA only after proper scrutiny and marking a carbon copy (cc) to the course in-charge. If any modifications are required, the team leader will be notified and the same procedure will be followed. Deadline for every task should be mentioned by the CLTA. If the team has not submitted the material on time, the CLTA should raise an alarm by sending a warning message and thus, record the delay time in his journal/diary.

4.6 Web Team(WTAs)

This team is responsible for uploading Course in-charges lecture slides, and videos on edX platform. They also have to upload the lab handouts, quizzes, mid and end semester questions and their model answers which are sent by the coordinating TA. Apart from uploading, they have to maintain the site by cleaning up un-necessary or irrelevant data, update news forums, time table, announcements, syllabus, book references for the course, contact us page, students and TA list with contact numbers. They also need to reply to relevant queries. Note:- All TAs are responsible for grading quizzes, mid and end semester exam papers according to the model answers provided by the QPTA team.

5 Coordination Mechanism and Roles

5.1 Meetings

Weekly meetings are held with all the TAs and Course in-charge. All TAs must ensure to attend this meeting as important discussion takes place i.e. how to conduct labs, timings of quizzes, exams, project ideas and so on. Apart from this meeting, CLTAs should hold meetings and discuss how to conduct labs, one day prior to the lab session. For example, if 13 CLTAs are assigned Tuesday lab batch, all of them should meet on Monday, discuss lab handout and assignment, find different ways this lab can be taught to the students and inform the discussions taken place by Email, to the coordinating TA and the course in-charge.

5.2 Labs

Based on the meeting taken place, the previous day, explain the lab handouts to the students and ask them to read and execute the programs. Check the output of all programs for all the assigned students. Thereafter, suggest them to modify and execute the same programs if time permits. Ask them to solve Lab Assignments. If a student does not understand the assignment, guide them but do not solve the entire program. This is the learning process, so ask them to refer notes or lecture slides or lab handouts. Rate the students on a scale of 0 to 5 and send it to the coordinating TA.

5.3 Exams / Quizzes

The schedule of the exams and quizzes will be informed by the course in-charge to all the TAs in the weekly TA meeting. TAs should help in conducting the exam by supervising the class, help in paper distribution, collecting answer sheets, preventing students from copying and so on. If any problem arises, a senior TA or the course in-charge should be contacted and informed immediately. The assignment team should prepare the model answers for the quizzes/exams along with marking scheme and should be sent to the coordinating TA, who in-turn will send it to the course in-charge. After the approval, the web team will upload these answers on the course moodle. All TAs should contribute by correcting answer sheets of the students, based on the model answers provided.

6 Reporting Mechanism

6.1 Quiz and Project Teaching Assistants

The task will be assigned by the coordinating TA to the QPTA head/team leader to prepare lab handouts and solutions, lab assignments, and model solutions to exams/quizzes. These should be prepared by the members of the assignment team. The QPTA head should interact with the Lab CLTAs/STAs and get feedback about the students, regarding the difficulty level of handouts and assignments. On the basis of this feedback, the QPTA head should ask the team members to prepare handouts and assignments. After preparing them, they should be sent to the QPTA head in .txt format. The QPTA head, should then check the programs and its solutions. After proper checking, an appropriate document should be prepared in .doc and .pdf formats. These should then be sent to the coordinating TA and the course in-charge (by Email). Each TA should send a weekly report to the QP Team Leader, who in turn, after compiling, will send to coordinating TA and then the course in-charge. Refer to Section 7.1 and 7.2, under the section title Diaries.

6.2 Web Teaching Assistants

The task of uploading handouts/assignments/model answers is assigned to the team leader of this team by the coordinating TA. This should be uploaded on time and should be informed to the CLTAs, STAs, coordinating TA and the course in-charge. A weekly report should be submitted by all TAs to the web team leader, who in turn will forward the summary to the coordinating TA and then the course in-charge. Refer to Section 7.3 and 7.4, under the section title TA Diaries.

6.3 Consulting Lab Teaching Assistants (CLTA)

CLTAs should interact with the students such that the student starts taking interest in the subject and starts asking doubts. CLTA should clear all doubts of the student. He/She should note down all the doubts asked by a student and should mention them in the weekly report along with the suggestions. They should interact with the web team to confirm that all relevant handouts and assignments are uploaded on time.

CLTAs should also hold meetings and confirm that the contents / programs given in the lab handout are correct. In case if there is any error, it should be reported to the coordinating TA, assignment team and web team, so that appropriate action is taken. This should also be sent to the course in-charge. A weekly report should be submitted to coordinating TA and course in-charge. Refer to Section 7.5, under the section title TA Diaries.

6.4 Senior Teaching Assistants (STA)

STA should gather information/reports from CLTA, compile it and send it to the coordinating TA and course in-charge. They should interact with the CLTAs and should gather feedback regarding the students. They should also interact with the students and should ensure that the lab handout and assignments are completed by the students. A weekly report should be submitted to coordinating TA and course in-charge. Refer to Section 7.5, under the section title TA Diaries.

6.5 Coordinating TA

The coordinating TA is responsible for the entire process in CS101 and managing all the TAs. He/She should interact with the TAs and find out if any problem exists. He/she should hold weekly meetings with the respective teams i.e. CLTA, STA, WTA, and QPTA. He/she should also report to the course in-charge on regular basis and give regular updates. The lab handouts / assignments / model solutions that are received from the assignment team should be sent to the course in-charge. If any change is suggested by the course in-charge, the same should be conveyed by the coordinating TA to the assignment team head.

7 TA Diaries

7) TA Diaries

7.1) QPTA (Team Leader)

Roll No.:- 10305039 **Name:-** Yogesh Kakde **(QPTA Head)** **Email:-** yogesh@cse.iitb.ac.in **Mob:-** 987654321								
Task Assigned To:-		**Roll No.:-** 08010016 **Name:-** Aniket Modi **Email:-** aniketmodi91@gmail.com **Mob:-** 987654321						
No.	**Task**	**Date Assigned**	**Due Date**	**Date Received**	**Delayed**		**Summary**	**Overall Rating (0 to 10)**
					Days	**Action Taken**		
1	Prepare lab handout with 3 questions on Topic Array	6/09/2011	09/09/2011	09/09/2011	0	N/A	Good set of question chosen	7
2	…	…	…	…	…	…	…	…

Table 7.1.1 Task Assigned by QPTA Team Leader

10305039 Yogesh Kakde (QPTA – Team Leader / Head) Received Work								
Day / Info	**Roll No.**	10305039	10305063	10305042	09103019	08005059	08005058	08010016
	Name	Yogesh	Swapnil	Abhijeet	Karthik	Ankush	Nikhil	Aniket
Mon	Work							
	Hrs							
Tues	Work							
	Hrs							

Wed	Work							
	Hrs							
Thurs	Work							
	Hrs							
Fri	Work							
	Hrs							
Sun	Work							
	Hrs							
total	Work							
	Hrs							
Remarks:- Have interacted with CLTA/STA (Name, Roll No. & Batch) & have concluded that students have difficulty in understanding operators. Hence, have prepared more number of questions on this topic.								

Table 7.1.2 Maintaining Received Work

7.2) QPTA (Members)

Roll No.:- 08010016 **Name:-** Aniket Modi (ATA) **Email:-**aniketmodi91@gmail.com **Mob:-** 987654321			
Day	**Total Hrs**	**Time Devoted**	**Work Done**
Monday	2	(10:00 - 11:00) (15:00 - 16:00)	Prepared questions and answers (1 to 2) for Lab Handout 1 (Wed Batch)
Tuesday	2	(18:00 - 20:00)	Prepared 2nd and 3rd question for lab assignment. (Wed Batch)
Wednesday	1	(17:30 – 18:30)	Weekly meetings with all TAs and *course in-charge*
Thursday	0	---	---
Friday	2	(21:00 – 23:00)	Prepared 2nd and 3rd question for lab assignment. (Fri Batch)
Sunday	(1/2)	(14:00 – 14:30)	Modified model answer of Q 3 of quiz1

Table 7.2 Daily Diary of QPTA

7.3) WTA (Team Leader)

Roll No.:- 10305913 **Name:-** Deepak Jayanth **(WTA Head)** **Email:-** deejay@cse.iitb.ac.in **Mob:-** 987654321								
Task Assigned To:-		**Roll No.:-** 10305915 **Name:-** Anup Naik **Email:-** anupnaik@cse.iitb.ac.in **Mob:-** 987654321						
No.	**Task**	**Date Assigned**	**Due Date**	**Date Received**	**Delayed**		**Summary**	**Overall Rating (0 to 10)**
					No. of Days	**Action Taken**		
1	Uploaded quizzes on edX	6/09/2011	09/09/2011	09/09/2011	0	N/A	Task completed successfully	8
2	…	…	…	…	…	…	…	…

Table 7.3.1 Task Assigned by WTA Team Leader

10305913 Deepak Jayanth (WTA – Team Leader / Head) **Received Work**								
Day / Info	**Roll No.**	10305913	10305916	10305919	10305915	10305917	11305R009	11305R010
	Name	Deepak	Nitin	Anjali	Anup	Pratik	Snehalesh	Navin
Mon	Work							
	Hrs							
Tues	Work							
	Hrs							

Wed	Work							
	Hrs							
Thurs	Work							
	Hrs							
Fri	Work							
	Hrs							
Sun	Work							
	Hrs							
total	Work							
	Hrs							
Remarks:- Have interacted with CLTA/STA (Name, Roll No. and Batch) and have concluded that students have difficulty in understanding operators and conditional statements. Hence, have prepared more number of questions on this topic.								

Table 7.3.2 Maintaining Received Work

7.4) WTA (Members)

Roll No.:- 08010016 **Name:-** Anup Naik (WTA) **Email:-** anupnaik@cse.iitb.ac.in **Mob:-** 987654321			
Day	**Total Hrs**	**Time Devoted**	**Work Done**
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Sunday			

Table 7.4 Daily Diary of WTA

7.5) Consulting Lab Teaching Assistants (CLTA)

Roll No.:- 113050060 **Name:-** Dinesh Patil **(CLTA)** **Email:-** dineshpatil@cse.iitb.ac.in	
Roll No.:- 10305078 **Name:-** Ankita **(STA)** **Email:-** ankita@cse.iitb.ac.in	
Day	Wednesday, 07 September 2011
Time Slot	20:30 to 22:30
Batch	3
Assisted Team No.	11
Total Students	8 students

Problems Faced by Students:-

No.	Problems	Faced by No. of Students
1	Confusion between logical AND (&&) and Logical OR(||) operators.	2
2	Writing C++ program in Terminal Window and not in Gedit.	1
3	Ternary Operators not understood.	3
3	Lab 4, Program 3. (1-2+3-4+5-6+7-8……). Problem in understanding the logic of the program.	4
4	Confusion regarding Mod Operator (%).	2
5	Switch statement not understood.	1
6	C++ program on simple calculator not understood.	1

Table 7.5 Weekly Lab Diary of CLTA

7.6) Senior Teaching Assistants (STA)

Roll No.:- 10305078 **Name:-** Ankita **(STA)** **Email:-** ankita@cse.iitb.ac.in	
Day	Thursday, 08 September 2011
Time Slot	20:30 to 22:30
Assisted	Wednesday Batch
Total Students	85 students and 12CLTAs
Remarks:- Lab handouts have been completed successfully by all the students. The CLTAs have managed the lab session and have interacted with the students. Lab assignments have been completed by only 75 students. The remaining students have not completed entire program. They will be submitting during the make-up lab on Sunday. Also attaching the feedback (weekly report) of 12 CLTAs.	

No.	**Problems**	**Faced by No. of Students**	**Lab Batch**	**LTA *In-charge***	**Solved**	**Suggestions**
1	Not understood looping	5	21, 22	ABC, DEF	Yes/No	Require more problems on this topic.
2	…..					
3	…..					

Table 7.6 Weekly Lab Diary of STA

7.6) Coordinating TA

a) Assigning and Maintaining Work of QPTA

Roll No.:- 10305052 **Name:-** Ashutosh Shukla **(CTA)** **Email:-** ashutoshds@cse.iitb.ac.in **Mob:-** 987654321								
Task Assigned To:-		**Roll No.:-** 10305039 **Name:-** Yogesh Kakde **(ATA Head)** **Email:-** yogesh@cse.iitb.ac.in **Mob:-** 987654321						
No.	**Task**	**Date Assigned**	**Due Date**	**Date Received**	**Delayed**		**Summary**	**Overall Rating (0 to 10)**
					No. of Days	**Action Taken**		
1	Prepare lab handout with 3 questions on Topic Array	6/09/2011	09/09/2011	09/09/2011	0	N/A	Good set of question chosen	7
2	Prepare 5 lab assignments with 2 questions in each assignment. Topic: Arrays	6/09/2011	09/09/2011	10/09/2011	1	Informed the *course in-charge*	Did not receive on time, but the final result is good.	5
3	…	…	…	…	…	…	…	…

Table 7.6.a Assigning and Maintaining Work of QPTA

b) Assigning and Maintaining Work of WTA

Roll No.:- 10305052 **Name:-** Ashutosh Shukla **(CTA)** **Email:-** ashutoshds@cse.iitb.ac.in **Mob:-** 987654321								
Task Assigned To:-		**Roll No.:-** 10305913 **Name:-** Deepak Jayanth **(WTA Head)** **Email:-** deejay@cse.iitb.ac.in **Mob:-** 987654321						
No.	Task	Date Assigned	Due Date	Date Received	Delayed		Summary	Overall Rating (0 to 10)
					No. of Days	Action Taken		
1	Upload 5th lectures slide and video on course moodle and course home page	12/09/2011	13/09/2011	15/09/2011	2	???	????	3
2	Upload 5th lab handout on moodle and course home page	12/09/2011	13/09/2011	12/09/2011	0	N/A	???	6

Table 7.6.b Assigning and Maintaining Work of WTA

c) Meetings Held with QPTA

Roll No.:- 10305052 **Name:-** Ashutosh Shukla **(CTA)** **Email:-** ashutoshds@cse.iitb.ac.in **Mob:-** 987654321								
Meeting Held with QPTA								
No.	Date	Work Assigned (Y/N)	Problem Exists (Y/N)	Problem Solved (Y/N)	Solution	Further Action Required (Y/N)	State Action Taken	Summary
1	12/09/2011	Yes. See 7.5.a	Yes	Yes	…			
2								
3								
Attendance of QPTAs								
10305039	10305063	10305042	09103019	08005059	08005058	08010016		
Yogesh (H)	Swapnil	Abhijeet	Karthik	Ankush	Nikhil	Aniket		
Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.		
…	…	…	…	…	…	…		

Table 7.6.c Meetings Held with QPTA

d) Meetings Held with WTA

Roll No.:- 10305052 **Name:-** Ashutosh Shukla **(CTA)** **Email:-** ashutoshds@cse.iitb.ac.in **Mob:-** 987654321								
Meeting Held with WTA								
No.	Date	Work Assigned (Y/N)	Problem Exists (Y/N)	Problem Solved (Y/N)	Solution	Further Action Required (Y/N)	State Action Taken	Summary
1	12/09/2011	Yes. See 7.5.b	Yes	Yes	…			
2								
3								

Attendance of WTAs							
10305913	10305916	10305919	10305915	10305917	11305R009	11305R010	10305913
Deepak	Nitin	Anjali	Anup	Pratik	Snehalesh	Navin	Deepak
Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.	Sign + Dt.
…	…	…	…	…	…	…	…

Table 7.6.d Meetings Held with WTA

e) Meetings Held with CLTA and STA

Roll No.:- 10305052 **Name:-** Ashutosh Shukla **(CTA)** **Email:-** ashutoshds@cse.iitb.ac.in **Mob:-** 987654321								
Meeting Held with STA and CLTAs of Monday Batch								
No.	Date	Work Assigned (Y/N)	Problem Exists (Y/N)	Problem Solved (Y/N)	Solution	Further Action Required (Y/N)	State Action Taken	Summary
1								
2								

Attendance of STA and CLTAs												
STA	LTA1	LTA2	LTA3	LTA4	LTA5	LTA6	LTA7	LTA8	LTA9	LTA10	LTA11	LTA12

Table 7.6.e Meetings Held with CLTA and STA

8 Annexure

8.1 Lab Handout

Lab handouts are prepared by the lab team, based on the topics covered in the lectures of the previous week. For example, the lab handout for Lab 3, scheduled from 08/08/2011 to 14/08/2011, is based on the topics covered in the previous week i.e. 02/08/2011 and 03/08/2011. The list determining this is shown below.:-

The process for creating the lab handout is given below:-

8.1.1 Determine the Topic by CTA

The CTA should communicate with the course in-charge and confirm the topics which he/she will teach during the current week. The lab handout should be prepared on the topic, confirmed by the course in-charge.

8.1.2 Assigning of Work by CTA to CLTA Head

The work should be assigned to the CLTA head, i.e. to lab questions based on the topic conveyed by the course in-charge. The work should be assigned to the CLTA Head, by sending an Email to him/her and the course in-charge. The work should be maintained by the CTA in the diary i.e. See 7.5.a.

8.1.3 Assigning of Work by CLTA Head to CLTA Team Members

The information conveyed by the CLTA should be conveyed by the CLTA head to its team members. The CLTA team member should interact with the STAs and find out the complexity of the handout. The difficulty level and the topic should be conveyed by the CLTA head to its team members. This work should be maintained in the TA diary. See 7.1.

Topic	Lecture Date	Lab Date
Introduction to Programming	26/07/2011 and 27/07/2011	31/07/11
Rules of the game	29/07/11	1/08/2011 - 07/08/2011
Basic features of C++	02/08/2011 and 03/08/2011	08/08/2011 - 14/08/2011
Conditional Execution	05/08/11	15/08/2011 - 21/08/2011

8.1.4 Completing the Task Assigned and sending to CLTA Head

The CLTA team member to whom the work is assigned, should prepare a certain number of questions and solutions for the lab handout.

Example:-

Task assigned by the CLTA Head:- Prepare a program based on for loop.
CLTA Member:- Prepare a program for finding factorial of a number.

```
 //Prepared and Executed this program. File name:- prgFact.cpp
#include<iostream>
using namespace std;
int main() {
  int n,i,fact=1;
  cout<<"Enter a natural number : ";
  cin>>n;
  if(n<0) {
    cout<<"We cannot find factorial for -ve numbers "<<endl;return 0;
  }
  else if(n==0){
    cout<<"Factorial of "<<n<<" is 1"<<endl;
    return 0;
  }
  else{
    for(i=1;i<=n;i++){
      fact=fact*i;
    }
  }
  cout<<"Factorial of "<<n<<" is "<<fact<<endl;
  return 0;
  }
```

Sent this program .cpp file to the QPTA head.

8.1.5 Receiving Work from Team Members

The respective team members, after completing the work will send the programs to the CLTA head. Now, the CLTA head will scrutinize the programs. If any change is to be done, the same will be conveyed to the respective member and the same process from 8.1.3 to 8.1.5. will be followed. If all goes well, the team leader will prepare the lab handout containing the programs and solution. The lab handout will contain the following:-

a) General Information:- This will contain the institutes name, course name, semester, year, lab handout number, date, and file reference.

b) Objective:- This will contain the information regarding, what the lab handout contains.

c) Introduction:- This contains information, from where the files/programs have to be downloaded and executed.

d) Programs:- Here, different programs and their solutions will be given. This document should be submitted by the CLTA head to the CTA in .pdf and .doc format. Apart from this, the .cpp files should also be submitted.

8.1.6 Receiving Work from CLTA Head

The lab handout document prepared by the CLTA team is received by the CTA. The CTA should read the document and find if some errors exist. If yes, then send the comments to the CLTA head, and the same process is followed. If all is well, the CTA should send this document to the course in-charge, and ask for his comments. If the course in-charge asks to modify the document, the same should be conveyed to the CLTA head. If no modifications are suggested by the course in-charge, then, the CTA should send this document, along with the .cpp files, to the Web Team head, for uploading on moodle and course home page.

Indian Institute of Technology Bombay

Department of CSE, KRESIT

CS101, Computer Programming and Utilization,
Autumn Semester 2011-2012

Handout for Lab 4 for the week 15/08/11 to 21/08/11

Objective: This lab is to make you practice and test the understanding of while, for, do...while concepts as discussed by Sir in class. After one hour, an assignment will be uploaded which contains 1-2 Questions. You are supposed to solve the questions within the stipulated time of the lab and submit the single tar file on moodle. This will be graded. Instructions of submission of assignment are there in the assignment itself. We have senior students working as Teaching Assistants [TA]. They will help you in case of any difficulty. Please do not hesitate to ask them for assistance, if you get stuck at any stage or in submission.

Instructions: Visit the course moodle or the course home page. Locate the appropriate link for lab4 and copy the file lab4files.tar.gz in some appropriate directory. Un-bundle the files ($ tar -zxvf lab4files.tar.gz). Study the following problems and also study the sample programs written by our TAs to solve these. Compile and execute the programs. Think of modifications which you would like to make. Edit the programs, recompile and execute each one again. Test each program with different values of input. You should note down the execution results.

Problem-01: (Based on while loop) Write a program that reads numbers are entered one after another as input, terminated by a value 0. Add those numbers and display the sum.
Input: Numbers given one after another. Last number is 0.
Output : Sum of the numbers.

// **program lab4q1.cpp**

```
#include<iostream>
using namespace std;
int main(){
        int i, sum;
        cout<<"This program will print the sum of numbers you entered."<<endl;
        cout<<"Press enter after each number."<<endl;
        cout<<"Enter 0 to quit the program and see the result."<<endl;
        cout<<"Start entering numbers : ";
        sum=0;
        cin>>i;
        while(i != 0){
                sum = sum + i;
                cout << "Enter the next number : ";
                cin>>i;
         }
         cout<<"The sum of the numbers is : "<<sum<<endl;
         return 0;
}
```

Problem-02: (Based on for loop) Write a program to find factorial of a given number.
Input : Number
Output : Factorial of the number

// program lab4q2.cpp

```
#include<iostream>
using namespace std;
int main(){
 int n,i,fact=1;
 cout<<"Enter a natural number : ";
 cin>>n;
 if(n<0){
        cout<<"We can not find factorial for -ve numbers "<<endl;return 0;
 }
 else if(n==0){
        cout<<"Factorial of "<<n<<" is 1"<<endl;
        return 0;
 }
 else{
        for(i=1;i<=n;i++){
        fact=fact*i;
        }
 }
cout<<"Factorial of "<<n<<" is "<<fact<<endl;
return 0;
}
```

Problem-03: Write a program in C++ to ask the user to enter the positive integer divisible by 6. Display the Message "**Invalid Input, Enter again?**" if the number entered is not divisible by 6 and prompt the user to enter the number again. Continue to do so until the user enters either a valid input or attempt-limit is reached. Attempt-limit is five consecutive wrong attempts. Display the Message "**Five consecutive invalid attempts. Program Exited.**" and terminate your program using exit(0) in case the user enters five consecutive invalid inputs . Try break instead of exit(0). When User has Successfully entered the number, say N , print the sum of series:

SUM = **1 – 2 + 3 – 4 + 5 . . . . . upto N Terms**

```
//Program lab4-q3.cpp
#include <iostream>
#include <cstdlib>
using namespace std;

int main()
{
        int N,invalid_attempts = 0,sum = 0;
        bool pass=true;
        cout<<"Enter a Number divisible by 6 : ";
        do
        {
                cin >> N;
```

```
            if((N % 6) != 0)
            {
                if(invalid_attempts<4)
                {
                    cout << "Invalid Input , Enter again : ";
                    invalid_attempts += 1;
                }
                else
                {
                    cout<<"Five Consecutive Invalid attempts. Program Exited." << endl ;
                    exit(0);
                }
            }
            else
                pass = false;
        }
        while(pass);

        cout << "Input Accepted" << endl;
        // Summing the series now

        for (int i = 1 ; i<=N ; i++)
        {
            int sign = i % 2 ? 1 : -1 ;
            sum += sign * i;
        }
        cout << "Required sum is : "<< sum << endl;
        return 0;
}
```

Problem-04: Add N numbers entered by the user except the numbers which are multiples of 4. Take the value of N from the user.

Input: Value of N, N integers
Output: Addition of all the non multiples of 4 from the N integers

```
//Program lab4-q4.cpp
/*Add N numbers entered by the user except the numbers which are multiples of 4. Take the value of N from the user.
Input: Value of N, N integers
Output: Addition of all the non multiples of 4 from the N integers*/

#include <iostream>
using namespace std;
int main()
{
   int n=0;
   int sum=0;
   int i,number;
   cout<<"Enter the value of N : ";
   cin >> n;
```

```
    i = 1;
    while(i<=n)
    {
        i++;
        cout<<"Enter the next number : ";
        cin>> number;

        // if the number is divisible by 4, skip this iteration
            if ((n % 4) == 0)
                continue;
            sum+=n;
    }
    cout << "Addition is " <<sum<<endl;
    return 0;
}
```

8.2 Lab Quizzes

Lab quizzes are prepared by the quiz-project team, based on the topics covered in the lecture the previous week. For example, the lab handout for Lab 3, scheduled from 08/08/2011 to 14/08/2011, is based on the topics covered in the previous week i.e. 02/08/2011 and 03/08/2011. The method is the same as that of lab handout. The difference is that 5 lab assignments have to be prepared, i.e. for every batch (Mon-Fri). The process for creating the lab assignment is given below:-

8.2.1 Determination of the Topic by CTA

The CTA should communicate with the course in-charge and confirm the topics which he/she will teach during the current week. The lab assignment should be prepared on the topic, confirmed by the course in-charge.

8.2.2 Assigning of Work by CTA to QPTA Head

The work should be assigned to the QPTA head, i.e. to prepare lab assignments based on the topic conveyed by the course in-charge. The work should be assigned to the QPTA Head by sending an Email to him/her and the course in-charge. The work should be maintained by the CTA in the diary i.e. see 7.5.a.

8.2.3 Assigning of Work by QPTA Head to QPTA Team Members

The information conveyed by the CTA should be conveyed by the QPTA head to its team members. The QPTA team head should interact with the STAs and find out the complexity of the assignment. The difficulty level and the topic should be conveyed by the QPTA head to its team members. This work should be maintained in the TA diary. see 7.1.

8.2.4 Completing the Task Assigned, and sending it to QPTA

The QPTA team member, to whom the work is assigned, should prepare a certain number of questions for the quiz.

Example:-

Task assigned by the QPTA Head:- Prepare a program based on while loop.

QPTA Member:- Example chosen to prepare the following:- Write a program to perform arithmetic operations of n terms and determine the sum is prime or not.
E.g. (1+2+34+5+6+78+9+10+1112+13...) is prime or not.
Sent this program file to the QPTA head.

8.2.5 Receiving Work from Team Members

The respective team members, after completing the work, will send the programs to the QPTA head. The QPTA head will scrutinize the programs. If any change is to be done, the same will be conveyed to the respective member, and the same process from 8.2.3 to 8.2.5. will be followed. If all goes well, the team leader will prepare the lab assignment containing the programs. The lab assignment will contain the following:-

a) General Information:- This will contain the institutes name, course name, semester, year, lab assignment number and day, date, and file reference.

b) Problem:- This will contain the program statement to be solved by the student.

c) Assignment Submission Procedure:- This will contain information on how to submit the assignment solved by the student on edX platform. This document should be submitted by the QPTA head to the CTA in .pdf and .doc format.

8.2.6 Receiving Work from QPTA Head

The lab assignment document, prepared by the QPTA team is received by the CTA. The CTA should read the document and find if some errors exist. If yes, then send the comments to the QPTA head, and the same process is followed. If all is well, the CTA should send this document to the course in-charge and ask for his/her comments. If the course in-charge asks to modify the document, the same should be conveyed to the QPTA head. If no modifications are suggested by the course in-charge, then, the CTA should send this document, to the Web Team head, for uploading on moodle and course home page.

The lab schedule is normally from 20:30 to 22:30. During the first hour i.e. 20:30 to 21:30, the student is expected to study the lab handouts and ask difficulties and doubts to the Lab TA. During the last hour, i.e. 21:30 to 22:30, the student should solve the lab assignment. Thus, the lab assignment should be uploaded on moodle, between 21:20 to 21:30 only.