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# EXCEL SHEET ASSESSMENT XBLOCK

Enhancements to IIT BombayX Platform

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## 2 Introduction

### 2.1 Current state of online learning:

Massive Open Online Courses (MOOCs) is overpowered the area of online education everywhere. Professors from world class institutes are making online content \*(and assessments) available both in free and (increasingly) paid courses. Renowned institutions are accepting these credits as part of their curriculum. MOOC learning currently revolves around videos, text and images used by students to grab the subjective knowledge which is then assessed by subjective, objective or numerical based tests. In the US, school education is undergoing a transformation. More and more schools are adopting hybrid models of learning over the traditional classroom based (rote) approach. Assessment of learning is a weak area especially in MOOCs where physical assessment is impossible. In the hybrid models as well, physical assessments (as against the e-Assessments) bring in a subjective element. An e-Assessment has the risk of large scale 'copying' thus is not an appropriate parameter of judging the concepts of student.

### 2.2 edX Platform

edX is a massive open online course (MOOC) provider. It hosts online university level courses in a wide range of disciplines to a worldwide student body, including some courses at no charge. It also conducts research into learning based on how people use its platform. EdX differs from other MOOC providers such as coursera or Udacity, in that it is a non profit organization and runs on the open edX open-source software.

The Massachusetts Institute of Technology and Harvard University created edX in May 2012. More than 70 schools, non profit organizations, and corporations offer to plan to offer courses on the edX website. As of 29 December, 2016, edX has around 10 million students taking more than 1270 courses online.

### 2.3 XBlocks

XBlock is the SDK for the edX MOOC platform, written in python2 and announced and released publicly on March 14, 2013. It aims to enable the global software development community to participate in the construction of edx educational platform and the next generation of online and blended courses.

XBlock is a component architecture that enables developers to create independent course components, or XBlocks, that are able to work seamlessly with other components in the construction and presentation of an online course. Course authors are able to combine

XBlocks from a variety of sources — from text and video to sophisticated wiki-based collaborative learning environments and online laboratories — to create rich engaging online courses.

## 2.4 Objective

The purpose of our project is to create an exam system in which the teacher uploads a question paper written in the excel file in a certain format and the student uploads his answer file in the same format. The answer file of the student is then automatically graded. The student can also see his progress in the progress bar.

## 2.5 Purpose

1. To enhance the platform of IIT BombayX.
2. To reduce the workload of the teacher when large number of students are present.

## 2.6 The future of learning in the world:

In the future with advanced technology, we can allow not only excel files but also text, image and other possible files.

## 2.7 Scope of Project

This system will be Excel Sheet Management System for a School/University. This system will be designed to maximize the examination productivity by providing tools to assist in automating the correction of answer sheets and publishing grade process, which would otherwise have to be performed manually. This system can be quite useful in accounting exams and also in other exams which can involve excel comparisons.

## 2.8 Glossary

Open edx::Open edx is the open source platform supporting the edx courses.

Student::Person who will give the exam and upload his answer sheet.

Database::Collection of all the information monitored by this system.

Teacher::Person who is conducting the exam.

Software Requirements Specification::describes the functions of a system and its constraints.

User::Teacher or Student

OpenPyxl::It is a Python library for reading and writing Excel 2010 xlsx files.

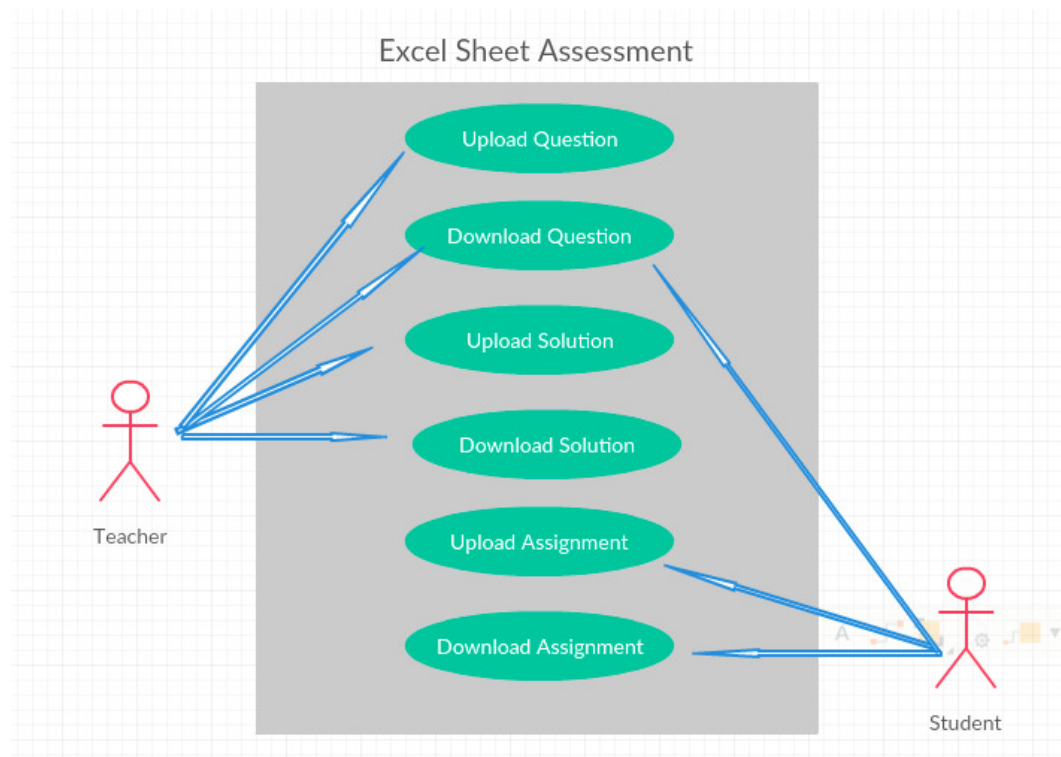
XBlock::To create rich, engaging online courses, course authors must be able to combine components from a variety of sources. XBlock, which is edX's component architecture, makes this possible. Courses are built hierarchically of pieces called XBlocks.

## 2.9 References

IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998.

## 3 Overview of the entire project

### 3.1 Use case Diagram



The system has two views-Teacher view and Student view. The teacher uploads an annotated question template which is then downloaded by the student. The student fills in the answers and uploads his answer template which is then automatically graded and can be viewed both by the teacher and the student.

### 3.2 Functional Requirements Specification-Student's View

1. Teacher uploads annotated question file.
2. Student downloads the file (from the student view).
3. Student solves the problem, makes changes to the annotated file, and uploads the answer script (from the student view).



4. Auto grader will run on the answer script. Grades will be computed.
5. The student can now view his grades.

### **3.3 Functional Requirements Specification-Teacher's View**

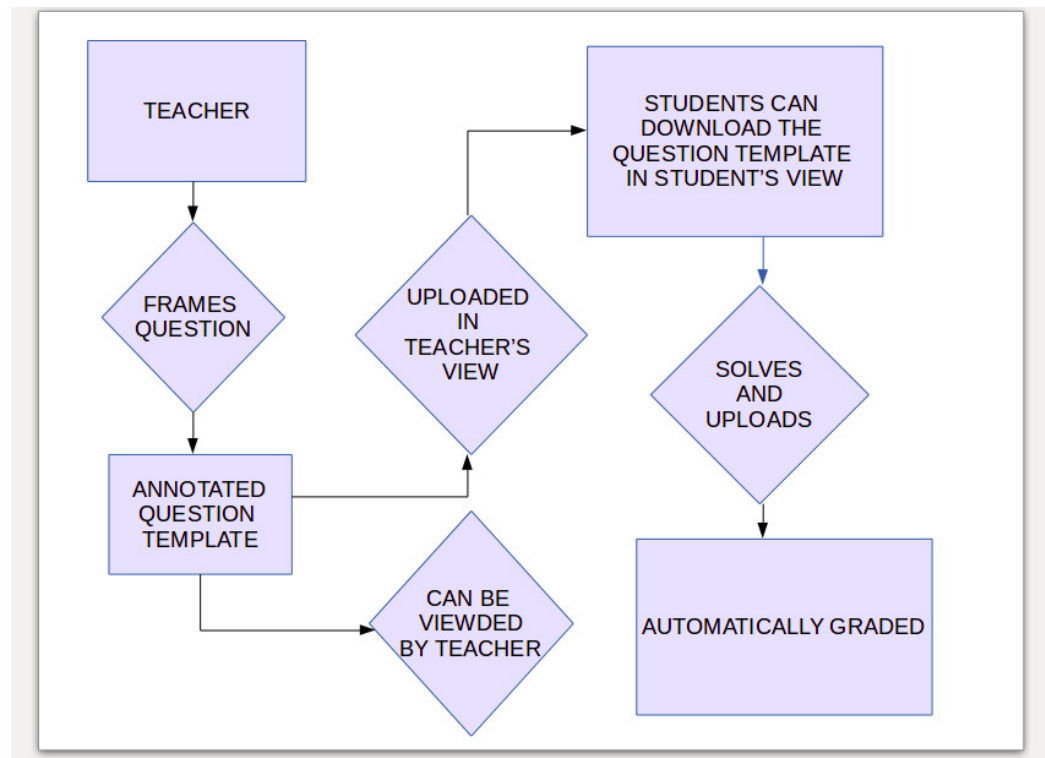
1. Teacher upload the annotated question template and answer sheet.
2. Student download the annotated question paper.
3. Student solves the problem, makes changes to the annotated file, and uploads the answer script (from the student view).
4. Auto grader will run on the answer script. Grades will be computed.
5. Both student and teacher can view the grade assigned to the student.
6. Teacher has the option to download the answer script.

### **3.4 Non-functional Requirements**

To use our system, the user must have edx platform installed in their local server. Also, the project preferably runs on web browsers like google chrome and Mozilla Firefox.

## 4 Workflow of the entire system

### 4.1 Logical Structure of data



## 4.2 Steps to be followed by the student

### 1. Log into the student's view and enter your course.

In question file, each cell has its corresponding marks indicated within angled brackets. To answer a particular cell, overwrite the marks and fill in with just your answer. Only .xlsx files are accepted.

For further reference, you can download [a sample question file here](#) and [a sample solution file here](#).

#### PROBLEM STATEMENT

You are given a trial balance. You have to complete the blanks in the balance sheet using the trial balance.

[Click here to download the answer template](#)

#### YOUR SUBMISSIONS

You have not attempted this question.

You have 5 of 5 attempts remaining.

To attempt the question, choose your answer file below

No file selected.

### 2. Choose your answer file through the browse button.

In question file, each cell has its corresponding marks indicated within angled brackets. To answer a particular cell, overwrite the marks and fill in with just your answer. Only .xlsx files are accepted.

For further reference, you can download [a sample question file here](#) and [a sample solution file here](#).

#### PROBLEM STATEMENT

You are given a trial balance. You have to complete the blanks in the balance sheet using the trial balance.

[Click here to download the answer template](#)

#### YOUR SUBMISSIONS

You have not attempted this question.

You have 5 of 5 attempts remaining.

To attempt the question, choose your answer file below

Now, upload it.

3. Your grade will be displayed along with the number of attempts you have left.

In question file, each cell has its corresponding marks indicated within angled brackets. To answer a particular cell, overwrite the marks and fill in with just your answer. Only .xlsx files are accepted.

For further reference, you can download [a sample question file here](#) and [a sample solution file here](#).

#### PROBLEM STATEMENT

You are given a trial balance. You have to complete the blanks in the balance sheet using the trial balance.

[Click here to download the answer template](#)

#### YOUR SUBMISSIONS

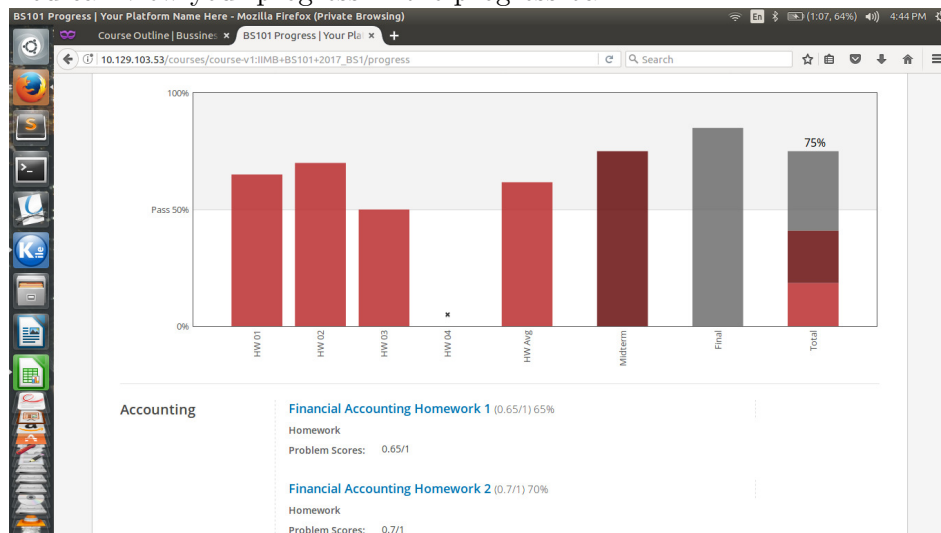
You submitted the file [sol1.xlsx](#) and been awarded a score of 65 for this submission.

You have 4 of 5 attempts remaining.

To attempt the question, choose your answer file below

No file selected.

4. You can view your progress in the progress bar.



### 4.3 Steps to be followed by the teacher

1. Create a course. Go to its advanced settings and add the following xblock 'agea' in its advanced module list.

2. Now go back to your course and create sections, subsections and units as required. On selecting a particular unit, you need to choose your required XBlock. In our case, it is 'Excel Autograded Assignment'.

3. Now, the teacher is shown a default structure of the student view. Click on the edit button at the top right corner.

INSTRUCTIONS

In question file, each cell has its corresponding marks indicated within angled brackets. To answer a particular cell, overwrite the marks and fill in with just your answer. Only .xlsx files are accepted.

For further reference, you can download [a sample question file here](#) and [a sample solution file here](#).

PROBLEM STATEMENT

Your Question Statement appears here

[Click here to download the answer template](#)

YOUR SUBMISSIONS

You have not attempted this question.

This question can be attempted as many times as you want.

To attempt the question, choose your answer file below

No file selected.

4. Now, you get need to fill in all the input fields, i.e. the Question Title, Question Text, Maximum Score, Problem Weight and Maximum attempts.

Editing: Excel Sheet Assessment

Settings

**Instructions**

The question file should have the marks corresponding to each of the cells that are to be answered by the students in angular brackets. The solution file should have the value of the answer corresponding to the cell as in the question file.

For further reference, you can download [a sample question file here](#) and [a sample solution file here](#).

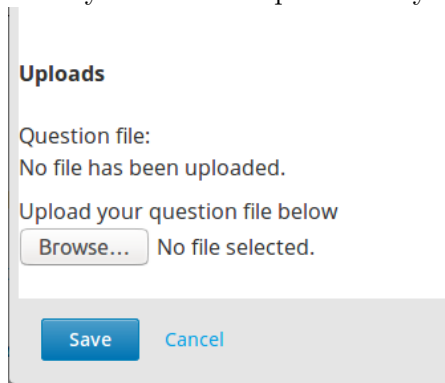
**Question Parameters**

Question title (This is the question title that appears at the top of the problem)

Question text (This is the question text that is shown to the student alongside the uploaded question file.)

Maximum score (The minimum score to be obtained by the student to be given full credit.)

5. Since you have not uploaded any question file yet, the following is displayed.



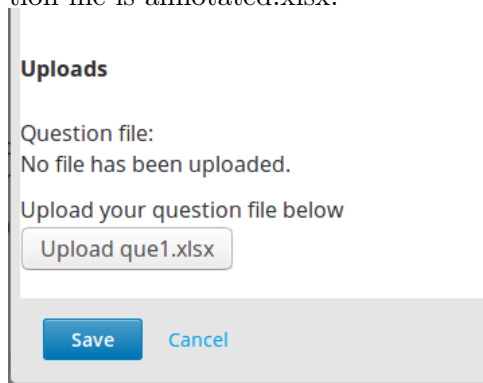
**Uploads**

Question file:  
No file has been uploaded.

Upload your question file below

No file selected.

6. Select a suitable question file using the browse button. Say, the name of your question file is annotated.xlsx.

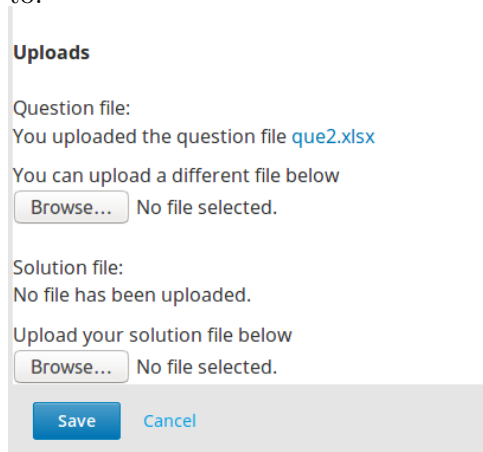


**Uploads**

Question file:  
No file has been uploaded.

Upload your question file below

7. Upload a suitable question file. You can also change it or download it if you want to.



**Uploads**

Question file:  
You uploaded the question file [que2.xlsx](#)

You can upload a different file below

No file selected.

Solution file:  
No file has been uploaded.

Upload your solution file below

No file selected.

8. In a similar manner upload your solution file.

Editing: Excel Sheet Assessment Settings

Maximum attempts permitted (Defines the number of times a student can try to answer this problem. If the value is not set, infinite attempts are allowed.)

5

**Uploads**

Question file:  
You uploaded the question file [que1.xlsx](#)

You can upload a different file below  
[Browse...](#) No file selected.

Solution file:  
You uploaded the solution file [ans1.xlsx](#)

You can upload a different file below  
[Browse...](#) No file selected.

[Save](#) [Cancel](#)

9. Save and publish your changes.

10. You can view the grades of the students in the grade book.

Your Platform Name Here - Mozilla Firefox (Private Browsing)

Course Outline | Bussine... | Your Platform Name He... | 10.129.103.53/courses/course-v1:3MB+BS101+2017\_BS1/instructor/api/gradebook

Gradebook

Search students

	HW 02	HW 03	HW 04	HW Avg	Midterm	Final	Total
agniveshadhikari	100	50	0	72	100	85	86
shreyasaha1997	100	100	0	100	100	100	100
ss	100	100	0	100	75	100	93
student	70	50	0	62	75	85	75
teacher_the_first	0	0	0	0	0	0	0

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## 4.4 User Requirement

The Student and the Teacher are expected to be Internet literate and be able to use a search engine.



## 5 Limitations

1. The grading is based on cell comparison only.
2. All the files uploaded should be in xlsx format.
3. Also,there will be error if we duplicate sections or subsections.
4. There should not be any videos or pictures in the excel file.
5. The author view is not working.That is why we have shown the instructions(originally intended to be the content of the author view) is shown in the studio view.

## 6 Appendix

### 6.1 Description of the various Fields

#### 6.1.1 display\_name

**Purpose:**

It displays the name of the course at the top of the student view and studio view.

**Scope:**

Scope.settings

#### 6.1.2 question

**Purpose:**

This is the problem statement given by the teacher. It is shown in student's view and it tells the student what to do.

**Scope:**

Scope.settings

#### 6.1.3 weight

**Purpose:**

It defines the number of points each problem is worth. If the value is not set, the problem is worth the sum of the option point values. For example, if  $\text{weight} = 100$ , then the exam will be graded out of 100.

**Scope:**

Scope.settings

#### 6.1.4 points

**Purpose:**

It is the maximum score that can be obtained by a student on a particular assignment.

**Scope:**

Scope.settings

**6.1.5 score****Purpose:**

It is the score given to the student. It is calculated by the autograder.

**Scope:**

Scope.user\_state

**6.1.6 attempts****Purpose:**

No. of times the student uploads the answer file.

**Scope:**

Scope.user\_state

**6.1.7 max\_attempts****Purpose:**

No. of times the student is allowed to upload the answer file. If this field is not filled by the teacher, then the student can submit the answer file infinite number of times.

**Scope:**

Scope.settings

**6.1.8 raw\_answer****Purpose:**

It refers to the answer excel file uploaded by the student.

**Scope:**

Scope.user\_state

**6.1.9 raw\_question****Purpose:**

It refers to the question excel file uploaded by the teacher.

**Scope:**

Scope.settings

**6.1.10 raw\_solution****Purpose:**

It refers to the solution excel file uploaded by the teacher.

**Scope:**

Scope.settings

**6.2 Description of the Class Methods****6.2.1 get\_submission(self)**

It returns the class field raw\_answer.

**6.2.2 get\_question(self)**

It returns the class field raw\_question.

**6.2.3 get\_solution(self)**

It returns the class field raw\_solution.

**6.2.4 student\_view(self, context=None)**

It renders the content of cms.It stores student\_state,id and max\_file\_size in context and passes it to the html file.It integrates the html,js and css files in a variable fragment and returns it.

**6.2.5 studio\_view(self, context=None)**

It stores display\_name,question,points,weight and max\_attempts in edit\_fields.It stores edit\_fields in context along with studio\_state,max\_file\_size and id and passes it to the html file.It integrates the html,js and css files in a variable fragment and returns it.

**6.2.6 studio\_state(self)**

It returns the following to be used in studio\_view::

- 1.display\_name
- 2.self.question
- 3.quploaded
- 4.suploaded
- 5.self.raw\_question

6.suploaded  
7.self.raw\_solution  
8.self.weight

### **6.2.7 student\_state(self)**

It returns the following to be used in studio\_view:: 1.display\_name  
2.self.question  
3.uploaded  
4.raw\_answer  
5.raw\_question  
6.score  
7.weight  
8.attempts  
9.max\_attempts

## **6.3 Description of the Miscellaneous Methods**

### **6.3.1 \_get\_sha1(file\_descriptor)**

It returns a hash value that is unique for every file.

### **6.3.2 \_resource(path)**

It is used to render the template.

### **6.3.3 load\_resource(resource\_path)**

It is used to load the template.

### **6.3.4 render\_template(template\_path, context=None)**

It is used to render the template.