

Prutor Interface and Database Improvements

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Introduction

Prutor is a tutoring system for introductory programming courses. In recent times, there has been a hike in popularity of online courses and Prutor can be a very helpful tool for instructors who teach introductory programming courses.

We have implemented various features to Prutor's admin interface. This includes addition of two modules: One for grading task assignment to Teaching Assistants (fixed or random assignment) and other for report generation. The report can be generated for students or the lab events (individual or all). Some other features which can help an instructor were identified and implemented, for example, deadline extension, CSV support for report generation, assigning maximum marks for a problem.

We modified the interaction with database tables and queries such that no entry is deleted from the interface, but marked as inactive. If an admin accidentally deletes an entry (account, problem or event), it can be recovered with ease.

This report acts as a guide to all the features and integrations that were added by us during winter semester 2016-17. In case of any issues, you can mail us at

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List of Changes Made

- New Dashboard
- Grading Tasks Module
- Report Generation Feature in Miscellaneous Module
- Deadline Extension Feature
- Feature to Change Maximum Marks for a Problem
- Allowing Recovery of Deleted Entries from Database

Format of This Report/Guide

We will explain one by one the changes that we have made and how to use them with the help of screenshots. We will also list the name and location of files that we added/changed for that feature so that it becomes easier to understand/debug for someone who will later work on Prutor. All the screenshots are shown using the login credentials of an instructor, so some changes won't be visible to normal student users.

New Dashboard

The dashboard is the first thing that a non-student user sees when he/she logs into the system. Earlier there used to be 4 tabs in the dashboard which are now changed to 6 tabs 2 more new tabs - Grading Tasks and Miscellaneous Tasks were added.

Screenshot

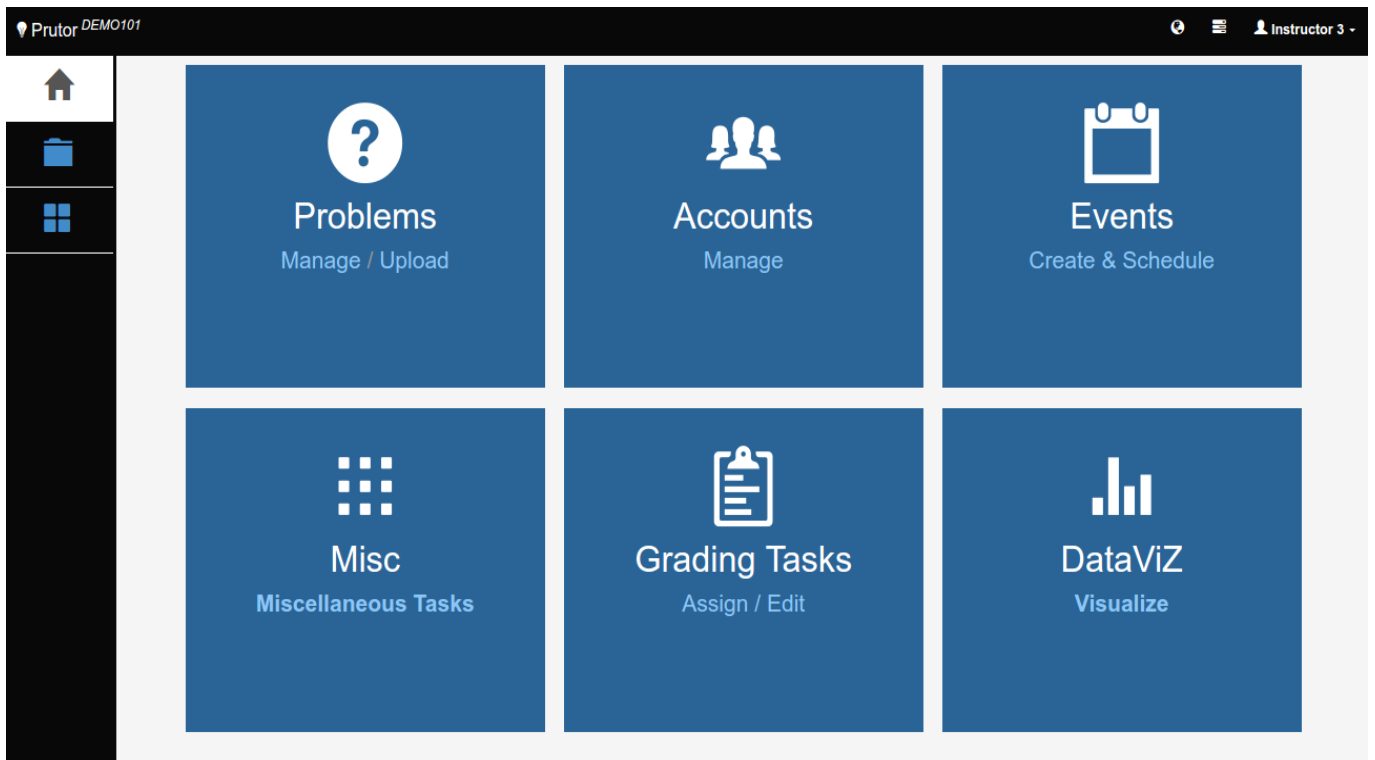


Figure 1: Dashboard

Files Modified/Added

1. codebase/webapp/views/_admin/home.dot - Modified

Grading Tasks Module

This module was made during December'16 winter vacations by Anuj Nagpal and Divyansh Singhvi.

Purpose of this module is easy grading task assignment to Teaching Assistants.

Screenshot

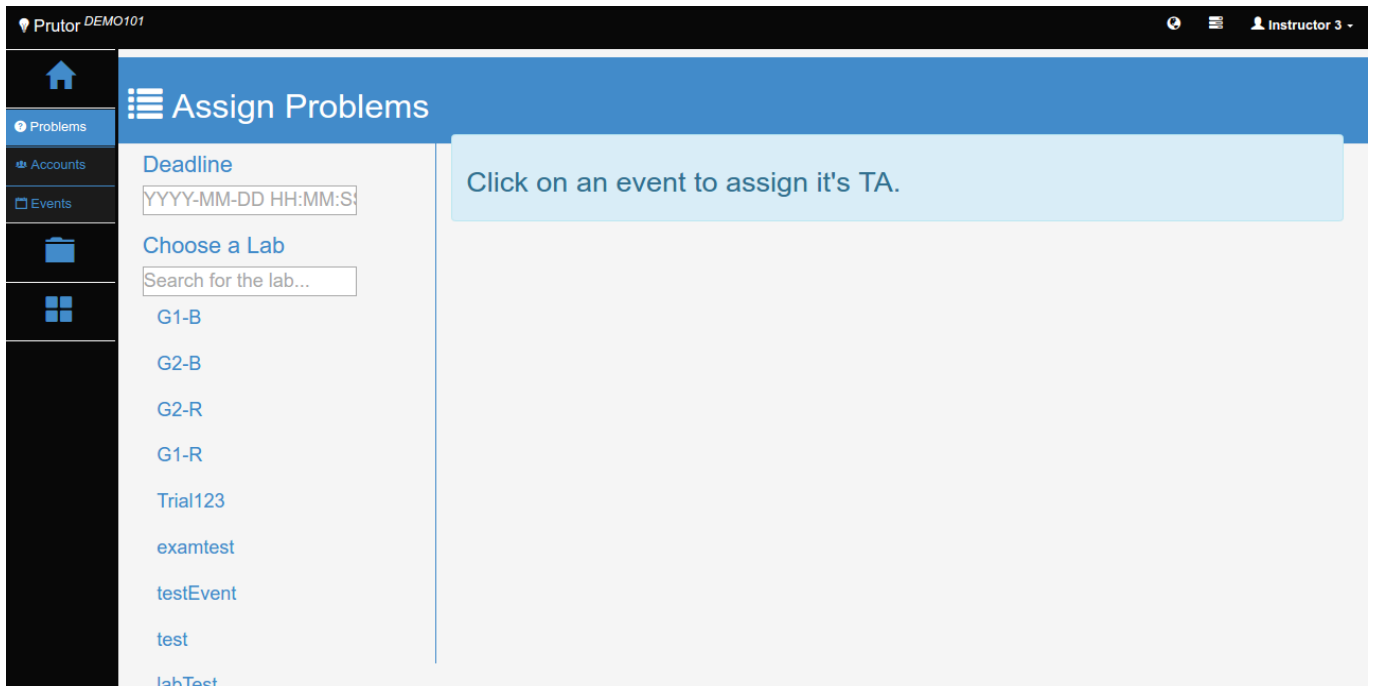


Figure 2: Grading Tasks

Step by Step Guide

- On the left there are two input boxes: one for setting the deadline and other for choosing a lab event.

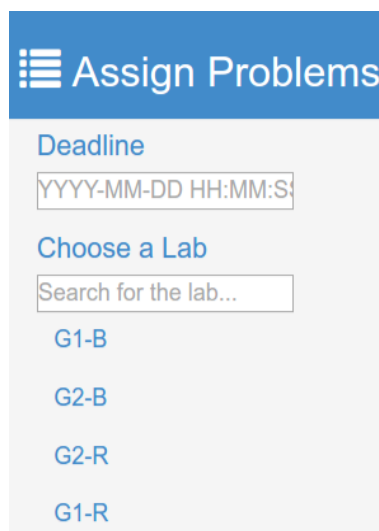


Figure 3: Input Options

- On clicking an event, you can see three columns: TA List, Problem Number Allotted and Number of Problems Allotted

Choose an Option	Specific Problem	Specific Number
TA List	Problem Number Allotted	Number of Problems Allotted
TA 1	2806	21
TA 2	2806	21
TA 3	2806	21
TA 4	2806	21
TA 5	2806	21
TA 6	2807	21
TA 7	2807	21
TA 8	2807	21
TA 9	2807	21
TA 10	2807	21
TA 11	2808	21
TA 12	2808	21
TA 13	2808	21
TA 14	2808	21
TA 15	2808	21

Figure 4: Grading Task Assigned to TAs

- You can find two options on the top of the columns: Problem Specific Assignment and Number Specific Assignment.

Choose an Option	Specific Problem	Specific Number
TA List	Problem Number Allotted	Number of Problems Allotted
TA 1	2806	21
TA 2	2807	21

Figure 5: Options for Grading Tasks

- If you want to assign specific problems to specific TAs, change the column entries in 2nd column and click on the Specific Problem option to assign the problems.
- If you want to assign specific number of problems to specific TAs, change the column entries in 3rd column and click on the Specific Number option to assign the problems.

Files Modified/Added

- codebase/webapp/public/scripts/admin/problems/assignta.js - Added
- codebase/webapp/views/_admin/problems/assignta.dot - Added
- codebase/webapp/routes/problems/assignta.js - Added
- codebase/webapp/app_modules/assignta.js - Added
- codebase/webapp/bootstrap/acl.js - Modified
- codebase/webapp/routes/problems/index.js - Modified

Miscellaneous Module

This module is added for miscellaneous tasks and looks similar to the original dashboard. Currently only one tab (ReportGen) out of six is made active and functioning.

Screenshot of Miscellaneous Section

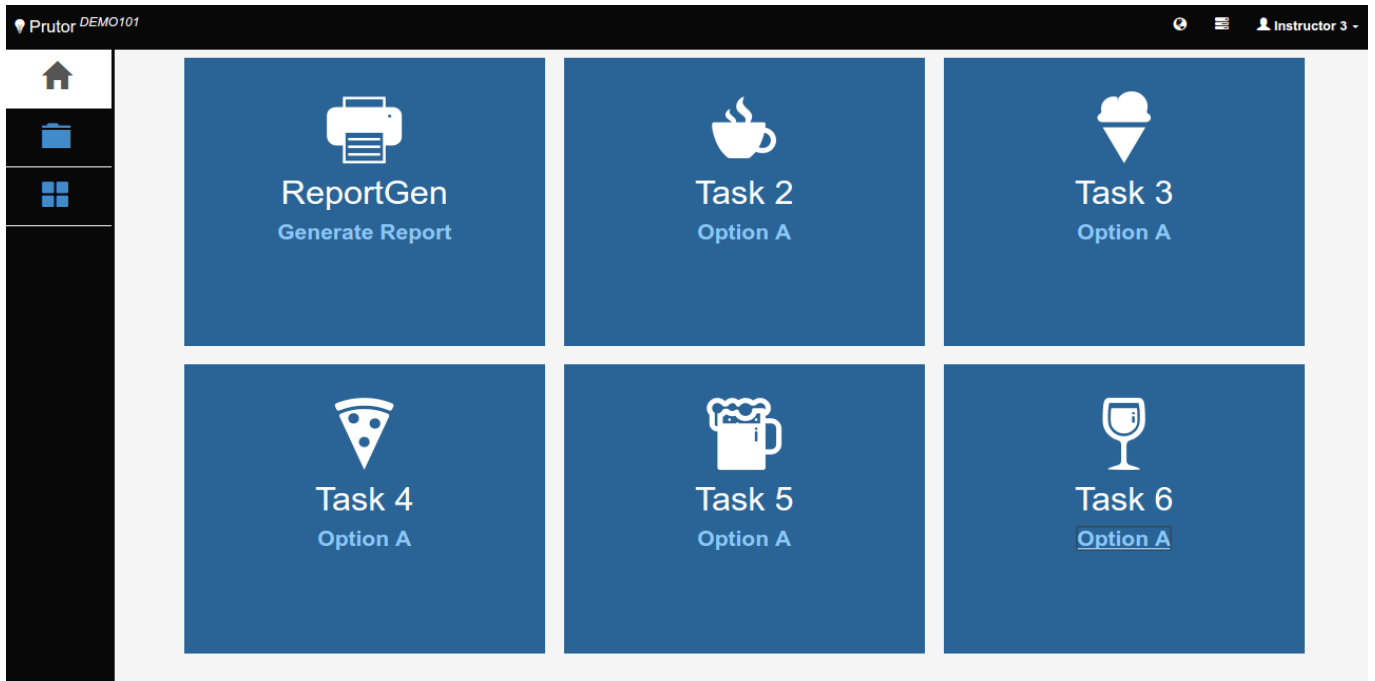


Figure 6: Misc

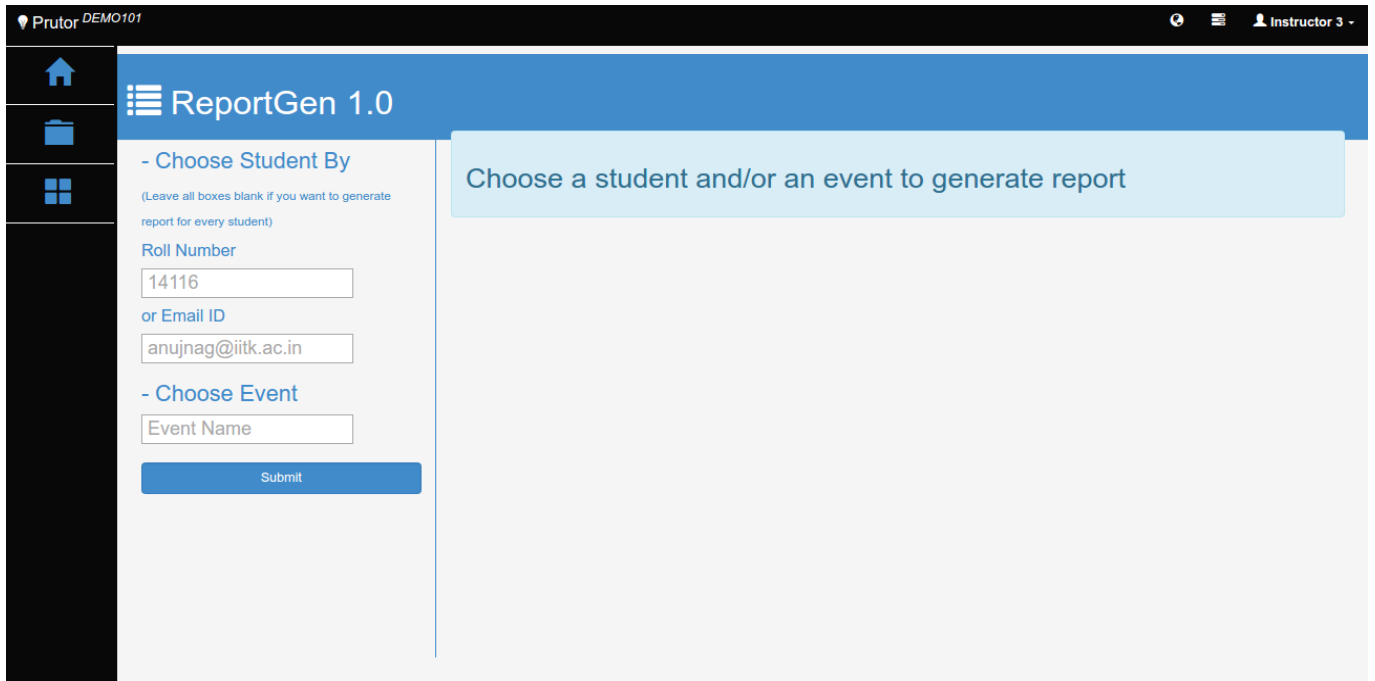
Files Modified/Added

- codebase/webapp/bootstrap/acl.js - Modified
- codebase/webapp/routes/miscellaneous.js - Added
- codebase/webapp/app.js - Modified
- codebase/webapp/views/_admin - Modified

ReportGen

ReportGen feature generates marks report for students for individual as well as all lab events. The module is provided with CSV support also i.e. you can download the report as a csv file.

Screenshot



Prutor DEMO101

Instructor 3

ReportGen 1.0

- Choose Student By
(Leave all boxes blank if you want to generate report for every student)

Roll Number
14116

or Email ID
anujnag@iitk.ac.in

- Choose Event
Event Name

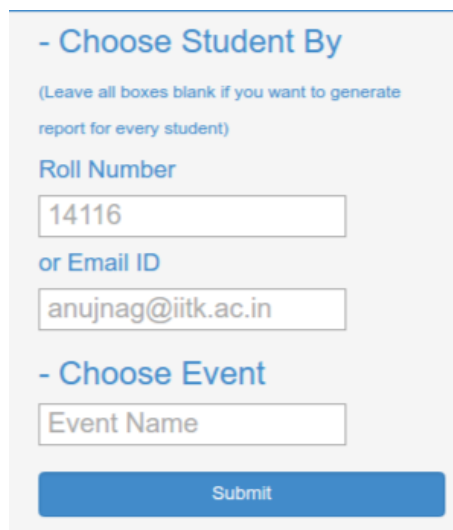
Submit

Choose a student and/or an event to generate report

Figure 7: ReportGen

Step By Step Guide

- You have to provide two inputs, student's roll number or email ID and the event name



- Choose Student By

(Leave all boxes blank if you want to generate report for every student)

Roll Number
14116

or Email ID
anujnag@iitk.ac.in

- Choose Event
Event Name

Submit

Figure 8: Input Options For Reportgen

- If you leave the event input box empty, report for all the lab events for that student will be generated.
- If you leave roll number and email ID input box empty, report for all students for that lab event will be generated.
- If you leave all boxes empty, report for all students for all lab events will be generated.
- On the top, export csv file option is also provided

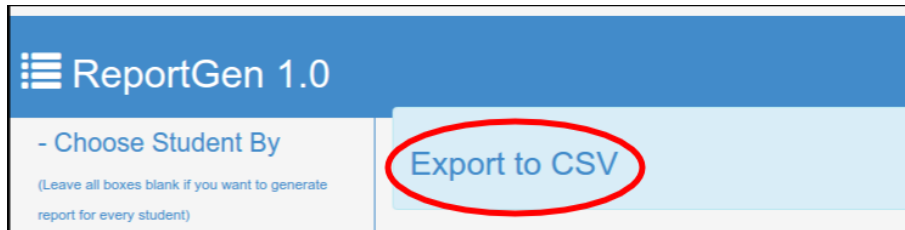


Figure 9: ReportGen

Files Modified/Added

- codebase/webapp/app_modules/reportgen.js - Added
- codebase/webapp/bootstrap/acl.js - Modified
- codebase/webapp/views/_admin/reportgen/main.dot - Added
- codebase/webapp/routes/reportgen.js - Added
- codebase/webapp/app.js -Modified
- codebase/webapp/public/scripts/admin/reportgen.js - Added

Deadline Extension Feature

A new event dashboard which supports extending deadline by any amount (by few minutes or by many days, anything) has been made which is there on the right of events page.

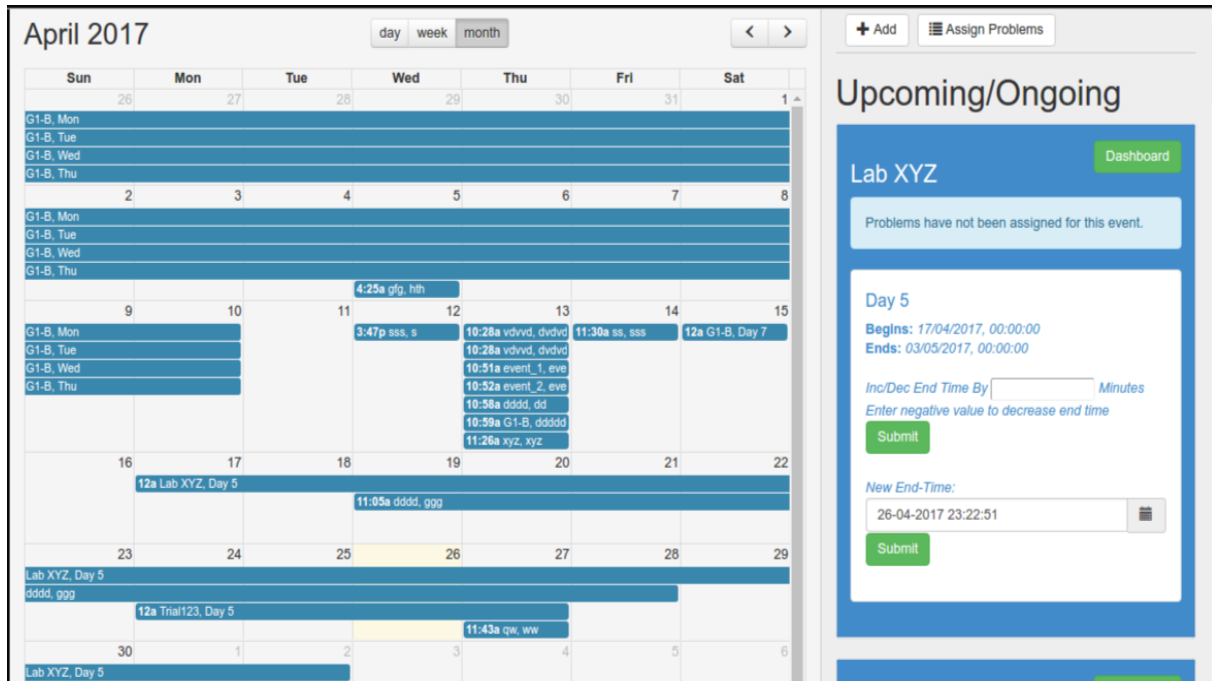


Figure 10: Events Page

There are two options:

- Extend deadline by some days

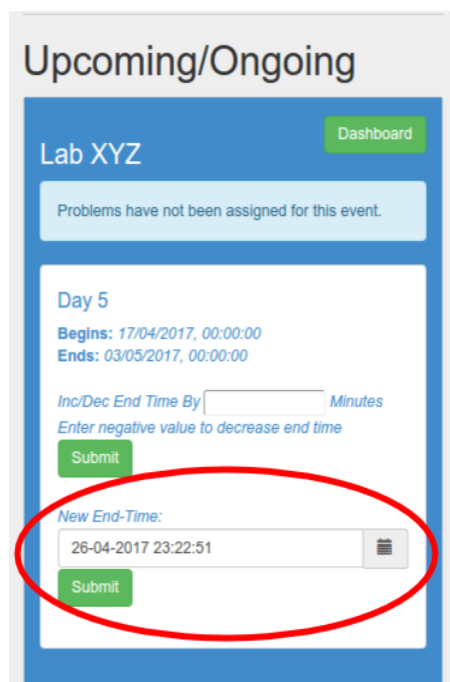
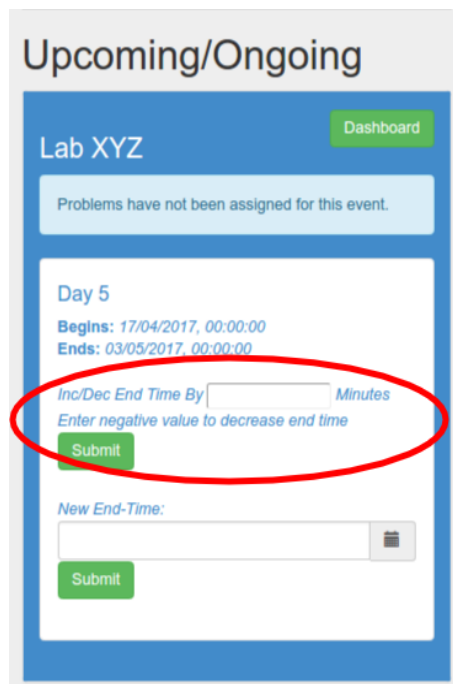


Figure 11: Deadline Extension By Days

- Extend deadline by some minutes (negative time also allowed)



The screenshot shows a web application interface titled "Upcoming/Ongoing". Below the title is a blue header bar with "Lab XYZ" on the left and a green "Dashboard" button on the right. A light blue message box states "Problems have not been assigned for this event." Below this is a white box with a blue border containing the following information:

- Day 5**
- Begins:** 17/04/2017, 00:00:00
- Ends:** 03/05/2017 00:00:00
- A form labeled "Inc/Dec End Time By" with a text input field and the word "Minutes" to its right. Below the input field is the text "Enter negative value to decrease end time".
- A green "Submit" button.
- A section labeled "New End-Time:" with a date-time input field and a calendar icon to its right.
- A green "Submit" button.

A red oval highlights the "Inc/Dec End Time By" input field and the "Submit" button below it.

Figure 12: Deadline Extension By Minutes

Files Modified/Added

- codebase/webapp/public/scripts/admin/events.js - Modified

Feature to Change Maximum Marks

On the manage problems page, a small new feature has been added which allows you to change maximum marks for a problem

Screenshot of Problems Page

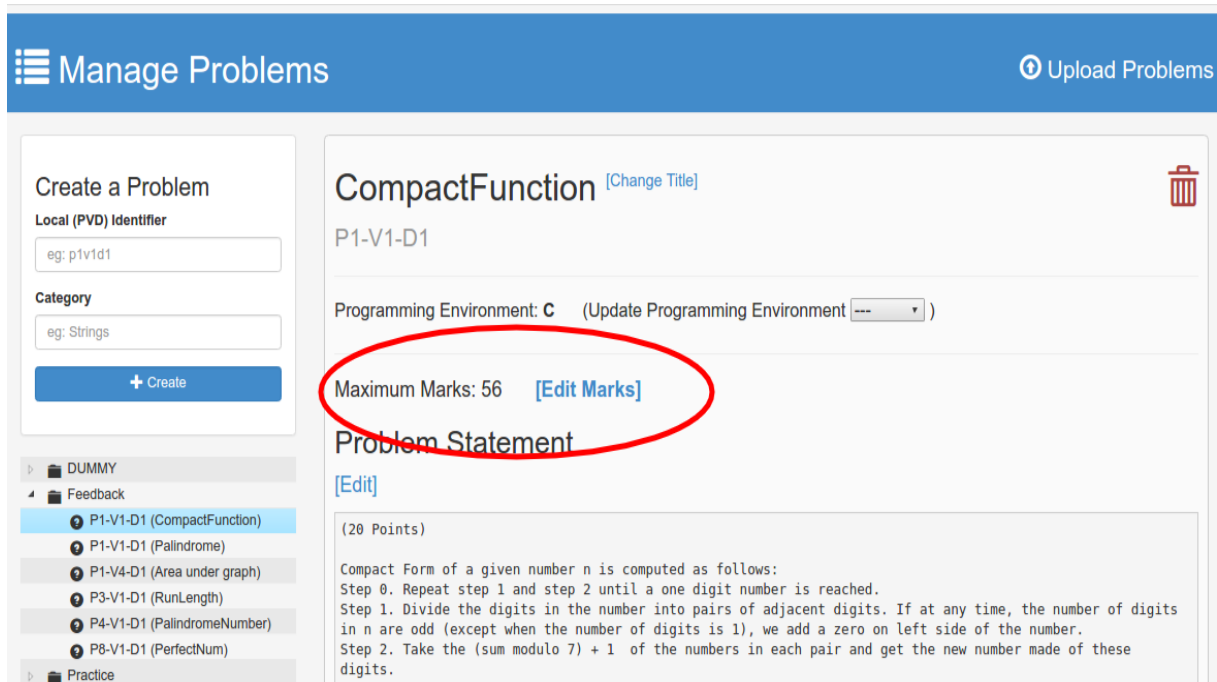


Figure 13: Manage Problems Page

On clicking the edit marks option, an input box appears with a save button. Enter the new maximum marks you want to fix for that problem and save. For achieving this task, a new attribute(column), marks was added in the table named problems.

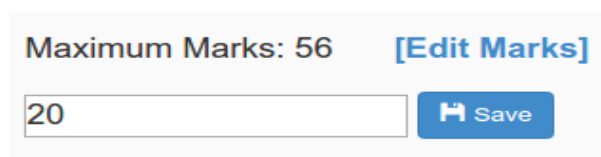


Figure 14: Edit Maximum Marks

Files Added/Modified

- prutor/rdb/schema.sql - Modified
- codebase/webapp/views/_admin/problems/problemView.dot - Modified
- codebase/webapp/public/scripts/admin/problems/manage.js - Modified

Allowing Recovery of Deleted Entries from Database

- To allow recovery of deleted entries if by chance a user deletes an entity (problem, event, account etc), we added an attribute "is_deleted" to all the appropriate tables.
- If an entity is deleted, its is_deleted entry is set to 1
- To recover an entry, change its is_deleted entry to 0 in the database
- All the queries and schema were accordingly updated to accommodate this change for all the tables.

Files Added/Modified

- prutor/rdb/schema.sql - Modified
- codebase/webapp/app_modules/tests.js - Modified
- codebase/webapp/app_modules/tasks.js - Modified
- codebase/webapp/app_modules/engine.js - Modified
- codebase/webapp/app_modules/accounts.js - Modified
- codebase/webapp/app_modules/assignments.js - Modified
- codebase/webapp/app_modules/scratchpad.js - Modified
- codebase/webapp/app_modules/statistics.js - Modified
- codebase/webapp/app_modules/feedback.js - Modified
- codebase/webapp/app_modules/grading.js - Modified
- codebase/webapp/app_modules/counts.js - Modified
- codebase/webapp/app_modules/problems.js - Modified
- codebase/webapp/app_modules/assignta.js - Modified
- codebase/webapp/app_modules/notifications.js - Modified
- codebase/webapp/app_modules/analytics.js - Modified
- codebase/webapp/app_modules/reportgen.js - Modified
- codebase/webapp/app_modules/pager.js - Modified
- codebase/webapp/app_modules/events.js - Modified
- codebase/webapp/app_modules/.js - Modified

Further Works Possible

- Data Analytics Module
- Lazy Template Assignment
- Cascading of table entries should be taken care of as deletion of one entry from a particular table can delete entries from other tables. Some of the queries need to be re-written for this purpose.
- Penetration testing of whole application for any vulnerabilities
- Step by step execution of code which will help students better understand how code runs
- Many other issues on prutor bitbucket repository