Visvesvaraya Technological University

"Jnana Sangama", Belgavi - 590018



A PROJECT PHASE I REPORT (17ISP78) ON

"Difficult Topic Recommendation System"

submitted in partial fulfillment of the Requirements for 8th Semester of

BACHELOR OF ENGINEERING

in

INFORMATION SCIENCE & ENGINEERING

by

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Under the guidance of
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DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

Certificate

This is to certify that the project work entitled, "Difficult Topic Recommendation System", is a bonafide work carried out by Pratyush Kumar(1CR17IS069), Saurav Sagar(1CR17IS082) & Virat Bhuwania(1CR17IS108) in partial fulfillment for the award of the degree of Bachelor of Engineering in Information Science & Engineering of Visvesvaraya Technological University, Belgaum, during the year 2020-21. It is certified that all corrections/suggestions indicated during reviews have been incorporated in the report. The project report has been approved as it satisfies the academic requirements in respect of the project work prescribed for the said Degree.

Name & Signature of Guide (Mrs. Dhanya Vishwanath)
Dept. of ISE, CMRIT

Name & Signature of HOD (Dr. M. Farida Begam) Dept. of ISE, CMRIT



DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

DECLARATION

We, the bonafide students of 7th semester, Information Science & Engineering, CMR Institute of Technology, Bangalore, hereby declare that the report entitled "Difficult Topic Recommendation System" has been carried out by us under the guidance of Mrs. Dhanya Vishwanath, Assistant Professor Information Science & Engineering Department, CMRIT Bangalore. This dissertation work is submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of Engineering in Information Science Engineering, of the Visvesvaraya Technological University, Belgaum during the academic year 2020-2021. Further the matter embodied in the project report has not been submitted previously by anybody for the award of any degree or diploma to any university.

Place:Bengaluru

Date:10/08/2021

Team members:

- 1. Pratyush Kumar (1CR17IS069)
- 2. Saurav Sagar (1CR17IS082)
- 3. Virat Bhuwania (1CR17IS108)

ABSTRACT

The Aim of this project is to make a backend as well as frontend application for revolving the engineering books, notes and solving doubts of students in the college institution. It involves uploading the books, notes and doubts which are useful for them. Students of the college can either add the books or the notes or ask the doubts as well in the website. With the help of machine learning we are analysing that which topic is difficult to understand. This project has been developed using HTML, CSS, Bootstrap, Javascript, React JS, Python, Django, Django Rest Framework, MySQL, Machine Learning.

Acknowledgment

I take this opportunity to express my sincere gratitude and respect to CMR Institute of Technology, Bengaluru for providing me a platform to pursue my studies and carry out my final year project

I have a great pleasure in expressing my deep sense of gratitude to **Dr. Sanjay Jain,** Principal, CMRIT, Bangalore, for his constant encouragement.

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Virat Bhuwania(1CR17IS108)



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CHAPTER 1

INTRODUCTION

Difficult Topic Recommendation System will be used to clarify the doubts from the teachers of their own choice. It will also solve the problem of books and notes. Students can study from the notes of their choice i.e from teacher notes or student notes. We will analyse the doubts of the students. By doing that teachers will get to know that in which topic the students are getting more doubt and from next time teachers will put more effort on that topic.



CHAPTER 2

LITERATURE SURVEY

Paper 1:-

<Reference to the paper>

11th CIRP Conference on Industrial Product-Service Systems:-

College Library Personalized Recommendation System Based on Hybrid Recommendation Algorithm.

Yonghong Tian, Bing Zheng, Yanfang Wang, Yue Zhang, Qi Wu

<Takeaway from the paper>

When the number of books provided by library is relatively large, it becomes difficult for user to select appropriate book from a lot of candidate books. Aiming to help user overcome the problem, this article proposed a hybrid algorithm, which is based on the collaborative filtering algorithm and content based algorithm. On this basis, Spark big data platform is combined to achieve the personalized book recommendation system and improve the utilization rate of book resources. The main contributions of this paper include: (1) describe the architecture of the hybrid recommender system and the details of all procedures of recommender system; (2) several studies empirically compare the performance of the hybrid with the pure collaborative and content-based methods; (3) demonstrate that the hybrid methods can provide more accurate recommendations than pure approaches. In the future, we will study the following two aspects: (1) Investigate different technologies for improving the performance of system. (2) Solve the problem of user cold start.

Paper 2:-

<Reference to the paper>

A Novel Approach for Book Recommendation using Fuzzy based Aggregation.

Article in Indian Journal of Science and Technology · February 2017



Shahab Saquib Sohail1, Jamshed Siddiqui1 and Rashid Ali2

DOI: 10.17485/ijst/2017/v10i19/96787

<Takeaway from the paper>

Fuzzy techniques have been used widespread for various scientific and daily life problems. Ordered Weighted Averaging (OWA) operator is a well-known fuzzy based averaging operator. A variety of its applications have been presented in the literature.

Several authors have used OWA operator for various applications. The author (Beg, 2005) used OWA operator based novel fuzzy queries for web searching. The researchers have also applied the OWA operator's application in several GIS environments..

Paper 3:-

<Reference to the paper>

An improvement of supplementary book suggestion system

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Chonburi, 20130, Thailand,
komate@gmail.com

<Takeaway from the paper>

In this paper, an efficient supplementary book suggestion system, called eSBS (efficient Supplementary Book Suggestion) system, is introduced to improve efficiency of the current system on discovering books relevant to a course description of a course. eSBS collects more course descriptions and terminologies, revises text processing, adds two new procedures: i)



adjective removal and ii) subset removal. Besides, some linguistic rules are updated. These three changes can help to correctly identify important contents (i.e. reserved word and keywords) contained in a course description (also in a book). Last, three new similarity matching techniques and a new similarity calculation are designed and applied to increase accuracy of identifying books relevant to a course description. Based on the experiments, the results show that the new proposed eSBS system outperforms the existing SBS system and the other two well-know keyword extraction algorithms in the terms of accuracy, recall, precision and F-measure on keyword extraction. Moreover, the percentages that suggested books from the eSBS system can cover course contents are also improved.



CHAPTER 3

PROBLEM DEFINITION

3.1 Objective:- Difficult Topic Recommendation System using Machine Learning.

3.2 Description:-

In Difficult Topic Recommendation System, B stands for Book, D stands for Doubt, N stands for Notes. This is web development project in which we are using machine learning.

3.3 Problem:-

- Doubt during exam times.
- Teacher clarify the common doubt separately to the students which is time consuming.
- Only teachers notes are available.
- Shortage of the book in the library.

3.4 Solution:-

- Doubt can be solved by using audio solution, video solution or by document solution.
- Teacher will have to clarify the common doubt only once.
- Toppers notes will also be available and students can study the notes whichever they want.
- Shortage of books can be solved.

3.5 How?

Difficult Topic Recommendation System will be used to clarify the doubts from the teachers of their own choice. It will also solve the problem of books and notes. Students can study from the notes of their choice i.e from teacher notes or student notes. We will analyse the doubts of the students. By doing that teachers will get to know that in which topic the students are getting more doubt and from next time teachers will put more effort on that topic.



Chapter 4

REQUIREMENTS

4.1 SYSTEM REQUIREMENT

4.1.1 Hardware Requirements

Processors: Intel Core i3

Processor Speed: 1.9GHz

RAM: 4GB

Storage:500GB

4.1.2 Software Requirements

Operating System:Windows/Linux

4.2 TECHNOLOGY REQUIREMENT

- **FRONTEND**:- HTML, CSS, JAVASCRIPT, REACT JS
- BACKEND:- DJANGO, DJANGO REST FRAMEWORK
- **DATABASE** :- MYSQL
- MACHINE LEARNING



Chapter 5

PROJECT ORGANISATION & TIMELINE

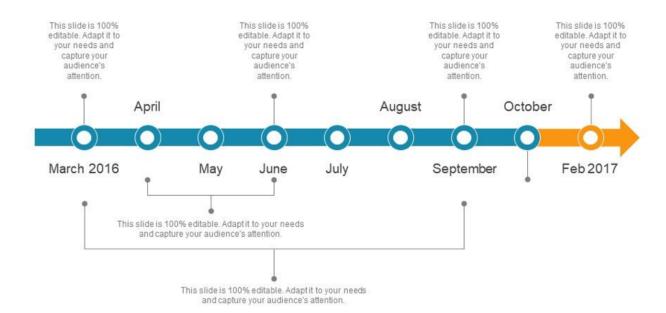
5.1 Work Breakdown

The project development team have each been assigned responsibilities. At certain phases of development, the clear demarcation of responsibilities may disappear, if necessary, to keep the project development up to speed with the decided project schedule.

- 1. Member 1
 - Database
 - Backend
- 2. Member 2
 - Literature Survey
 - Frontend
- 3. Member 3
 - Frontend
 - Database



5.2 Timeline





Implementation

```
from django.shortcuts import render
from django.db.models import Q
from Notes import models
# Create your views here.
# notes home page view
def notes home(request):
  return render(request, 'Notes/notes home.html')
# views for branch selection
def notes branch(request, sem):
  return render(request,'Notes/notes branch.html', {'sem':sem})
# views for presenting list of notes
def notes list(request,sem,subject,branch = None):
  # for searching :-- function will be implemented in future
  if request.method == 'POST':
     return render(request, 'Notes/subject list.html')
  if (sem == 1):
     module_list = models.Semester1Subject.objects.filter(subject_contains
=subject).order by('module')
     for module in module list:
       teacher = module.teacher
       break
  elif (sem == 2):
     module list = models.Semester2Subject.objects.filter(subject contains
=subject).order_by('module')
     for module in module list:
       teacher = module.teacher
       break
  elif(sem == 3):
     module list = models.Semester3Subject.objects.filter(subject contains
=subject).order by('module')
     for module in module list:
       teacher = module.teacher
       break
```



```
elif(sem == 4):
     module list = models.Semester4Subject.objects.filter(subject contains
=subject).order by('module')
     for module in module list:
       teacher = module.teacher
       break
  elif (sem == 5):
     module list = models.Semester5Subject.objects.filter(subject contains
=subject).order by('module')
     for module in module list:
       teacher = module.teacher
       break
  elif(sem == 6):
     module list = models.Semester6Subject.objects.filter(subject contains
=subject).order by('module')
     for module in module list:
       teacher = module.teacher
       break
  elif(sem == 7):
     module list = models.Semester7Subject.objects.filter(subject contains
=subject).order by('module')
     for module in module list:
       teacher = module.teacher
       break
  elif(sem == 8):
     module list = models.Semester8Subject.objects.filter(subject_contains
=subject).order by('module')
     for module in module list:
       teacher = module.teacher
       break
  return
render(request,'Notes/notes list.html', {'module list':module list,'subject':subject,'teacher':teacher
})
# views for presenting list of subject
def subject list(request,sem,branch = None):
  # for searching :-- function will be implemented in future
  if request.method == 'POST':
     return render(request, 'Notes/subject list.html')
```



```
if (sem == 1):
    subject list = models.Semester1Subject.objects.filter(semester exact = sem)
    subject set = set()
    for subject in subject list:
       subject = subject.subject.upper()
       subject set.add(subject)
  elif (sem == 2):
    subject list = models.Semester2Subject.objects.filter(semester exact = sem)
    subject set = set()
     for subject in subject list:
       subject = subject.subject.upper()
       subject set.add(subject)
  elif(sem == 3):
    branch
               = models.NotesBranch.objects.filter(branch icontains = branch)
    subject list = models.Semester3Subject.objects.filter(Q(semester exact =
sem),Q(branch exact = branch[0])
    subject set = set()
    for subject in subject list:
       subject = subject.subject.upper()
       subject set.add(subject)
  elif(sem == 4):
    branch
               = models.NotesBranch.objects.filter(branch icontains = branch)
    subject_list = models.Semester4Subject.objects.filter(Q(semester exact =
sem), Q(branch exact = branch[0])
    subject set = set()
    for subject in subject list:
       subject = subject.subject.upper()
       subject set.add(subject)
  elif(sem == 5):
               = models.NotesBranch.objects.filter(branch icontains = branch)
    subject list = models.Semester5Subject.objects.filter(Q(semester exact =
sem), Q(branch exact = branch[0])
    subject set = set()
    for subject in subject list:
       subject = subject.subject.upper()
       subject set.add(subject)
  elif (sem == 6):
               = models.NotesBranch.objects.filter(branch icontains = branch)
    branch
    subject list = models.Semester6Subject.objects.filter(Q(semester exact =
sem), Q(branch exact = branch[0])
    subject set = set()
    for subject in subject list:
       subject = subject.subject.upper()
```



```
subject set.add(subject)
  elif(sem == 7):
    branch
               = models.NotesBranch.objects.filter(branch icontains = branch)
    subject list = models.Semester7Subject.objects.filter(Q(semester exact =
sem), Q(branch exact = branch[0])
    subject set = set()
    for subject in subject list:
       subject = subject.subject.upper()
       subject set.add(subject)
  elif(sem == 8):
               = models.NotesBranch.objects.filter(branch icontains = branch)
    branch
    subject list = models.Semester8Subject.objects.filter(Q(semester exact =
sem), Q(branch exact = branch[0])
    subject set = set()
    for subject in subject list:
       subject = subject.subject.upper()
       subject set.add(subject)
  return render(request, 'Notes/subject list.html', {'subject list':subject set, 'sem':sem})
from django.contrib import admin
# from Notes.models import
NotesSemester, NotesBranch, NotesModule, Semester 1 Subject, Semester 2 Subject
from Notes import models
# Register your models here.
# admin for notes semester modle
class NotesSemesterAdmin(admin.ModelAdmin):
  list display = ['semester']
admin.site.register(models.NotesSemester,NotesSemesterAdmin)
# admin for notes branch modle
class NotesBranchAdmin(admin.ModelAdmin):
  list display = ['branch']
admin.site.register(models.NotesBranch,NotesBranchAdmin)
# admin for notes module modle
class NotesModuleAdmin(admin.ModelAdmin):
  list display = ['module']
```



admin.site.register(models.NotesModule,NotesModuleAdmin)

```
# admin for semester 1 subject modle
class Semester1SubjectAdmin(admin.ModelAdmin):
  list display = ['subject', 'semester', 'module', 'teacher', 'file']
admin.site.register(models.Semester1Subject,Semester1SubjectAdmin)
# admin for semester 2 subject modle
class Semester2SubjectAdmin(admin.ModelAdmin):
  list display = ['subject', 'semester', 'module', 'teacher', 'file']
admin.site.register(models.Semester2Subject,Semester2SubjectAdmin)
# admin for semester 3 subject modle
class Semester3SubjectAdmin(admin.ModelAdmin):
  list display = ['subject', 'semester', 'branch', 'module', 'teacher', 'file']
admin.site.register(models.Semester3Subject,Semester3SubjectAdmin)
# admin for semester 4 subject modle
class Semester4SubjectAdmin(admin.ModelAdmin):
  list display = ['subject', 'semester', 'branch', 'module', 'teacher', 'file']
admin.site.register(models.Semester4Subject,Semester4SubjectAdmin)
# admin for semester 5 subject modle
class Semester5SubjectAdmin(admin.ModelAdmin):
  list display = ['subject', 'semester', 'branch', 'module', 'teacher', 'file']
admin.site.register(models.Semester5Subject,Semester5SubjectAdmin)
# admin for semester 6 subject modle
class Semester6SubjectAdmin(admin.ModelAdmin):
  list display = ['subject', 'semester', 'branch', 'module', 'teacher', 'file']
admin.site.register(models.Semester6Subject,Semester6SubjectAdmin)
# admin for semester_7_subject modle
class Semester7SubjectAdmin(admin.ModelAdmin):
  list display = ['subject', 'semester', 'branch', 'module', 'teacher', 'file']
```



admin.site.register(models.Semester7Subject,Semester7SubjectAdmin)

```
# admin for semester 8 subject modle
class Semester8SubjectAdmin(admin.ModelAdmin):
  list display = ['subject', 'semester', 'branch', 'module', 'teacher', 'file']
admin.site.register(models.Semester8Subject,Semester8SubjectAdmin)
from django.db import models
# Create your models here.
# model for semester
class NotesSemester(models.Model):
  semester = models.PositiveIntegerField()
  def str (self):
    return str(self.semester)
# model for branch
class NotesBranch(models.Model):
            = models.CharField(max length = 20)
  def str (self):
    return str(self.branch)
# model for module
class NotesModule(models.Model):
            = models.PositiveIntegerField()
  module
  def str_(self):
    return str(self.module)
# model for 1st semester subject
class Semester1Subject(models.Model):
  semester = models.ForeignKey(NotesSemester,on_delete=models.CASCADE)
  subject = models.CharField(max length = 30)
            = models.ForeignKey(NotesModule,on_delete=models.CASCADE)
  module
           = models.CharField(max length = 30)
  teacher
          = models.FileField(upload to='Semester 1 Notes')
  file
```



```
# model for 2nd semester subject
class Semester2Subject(models.Model):
  semester = models.ForeignKey(NotesSemester,on_delete=models.CASCADE)
  subject = models.CharField(max length = 30)
           = models.ForeignKey(NotesModule.on_delete=models.CASCADE)
  module
  teacher = models.CharField(max length = 30)
  file
         = models.FileField(upload to='Semester 2 Notes')
# model for 3rd semester subject
class Semester3Subject(models.Model):
  semester = models.ForeignKey(NotesSemester,on delete=models.CASCADE)
          = models.ForeignKey(NotesBranch,on_delete=models.CASCADE)
  branch
  subject = models.CharField(max length = 30)
           = models.ForeignKey(NotesModule,on_delete=models.CASCADE)
  module
           = models.CharField(max length = 30)
  teacher
  file
         = models.FileField(upload to='Semester 3 Notes')
# model for 4rd semester subject
class Semester4Subject(models.Model):
  semester = models.ForeignKey(NotesSemester,on delete=models.CASCADE)
          = models.ForeignKey(NotesBranch,on_delete=models.CASCADE)
  branch
  subject = models.CharField(max length = 30)
           = models.ForeignKey(NotesModule,on delete=models.CASCADE)
  module
           = models.CharField(max length = 30)
  teacher
  file
         = models.FileField(upload to='Semester 4 Notes')
# model for 5rd semester subject
class Semester5Subject(models.Model):
  semester = models.ForeignKey(NotesSemester,on delete=models.CASCADE)
           = models.ForeignKey(NotesBranch,on_delete=models.CASCADE)
  branch
  subject = models.CharField(max length = 30)
           = models.ForeignKey(NotesModule,on_delete=models.CASCADE)
  module
         = models.CharField(max length = 30)
  teacher
  file
         = models.FileField(upload to='Semester 5 Notes')
# model for 6rd semester subject
class Semester6Subject(models.Model):
  semester = models.ForeignKey(NotesSemester,on_delete=models.CASCADE)
           = models.ForeignKey(NotesBranch,on_delete=models.CASCADE)
  branch
          = models.CharField(max length = 30)
  subject
          = models.ForeignKey(NotesModule,on_delete=models.CASCADE)
  module
  teacher
           = models.CharField(max length = 30)
         = models.FileField(upload to='Semester 6 Notes')
  file
```



```
class Semester7Subject(models.Model):
  semester = models.ForeignKey(NotesSemester,on_delete=models.CASCADE)
           = models.ForeignKey(NotesBranch,on_delete=models.CASCADE)
  branch
  subject
           = models.CharField(max length = 30)
            = models.ForeignKey(NotesModule,on delete=models.CASCADE)
  module
           = models.CharField(max length = 30)
  teacher
  file
         = models.FileField(upload to='Semester 7 Notes')
# model for 8rd semester subject
class Semester8Subject(models.Model):
  semester = models.ForeignKey(NotesSemester,on delete=models.CASCADE)
  branch
           = models.ForeignKey(NotesBranch,on_delete=models.CASCADE)
          = models.CharField(max length = 30)
  subject
            = models.ForeignKey(NotesModule,on_delete=models.CASCADE)
  module
           = models.CharField(max length = 30)
  teacher
  file
         = models.FileField(upload to='Semester 8 Notes')
{% extends "Book/base.html" %}
{% block home %} <a class="nav-link" href="/Book/after login home"><button type="button"
class="btn btn-outline-success">Home <span class="sr-only">(current)</span></button></a>
{% endblock %}
{% block logout %} <a class="nav-link" href="/accounts/logout"><button type="button"
class="btn btn-outline-success">Logout</button></a> {% endblock %}
{% block dropdown %}
<a class="nav-link dropdown-toggle" href="#" id="navbarDropdown" role="button"
data-toggle="dropdown" aria-haspopup="true" aria-expanded="false" style="border-left:red
solid 2px;border-right:red solid 2px;border-radius:50%;">
  <b>{{login user|upper}}</b>
</a>
<div class="dropdown-menu" aria-labelledby="navbarDropdown">
 <a class="dropdown-item" href="/Book/uploaded book">Books</a>
 <div class="dropdown-divider"></div>
 <a class="dropdown-item" href="/accounts/logout">Logout</a>
</div>
{% endblock %}
{% block head %}
  <style>
   body{
    font-style:italic;
  </style>
```



```
{% endblock %}
{% block body %}
<br><br><br><br>>
<div class="container my-5" style="border-left:solid 7px red;border-right:solid 7px</pre>
red;border-radius:10%;"><br>
  <h2>Add your unused Book to help others</h2><hr>
 <form method="post">
 <div class="form-group row">
  <label for="bname" class="col-sm-2 col-form-label">Book Name</label>
  <div class="col-sm-10">
   <input type="text" class="form-control" id="bname" placeholder="Book Name"</pre>
name="bname" required>
  </div>
 </div>
 <div class="form-group row">
  <label for="bsemester" class="col-sm-2 col-form-label">Semester</label>
  <div class="col-sm-10">
   <input type="text" class="form-control" id="bsemester" placeholder="Semester"</pre>
name="bsemester" required>
  </div>
  {% if flag semester %}
   {{msg|lower}}
  {% endif %}
 </div>
 <div class="form-group row">
  <label for="bauthor" class="col-sm-2 col-form-label">Book Author</label>
  <div class="col-sm-10">
   <input type="text" class="form-control" id="bauthor" placeholder="Book Author"</pre>
name="bauthor" required>
  </div>
 </div>
 <div class="form-group row">
  <label for="bbranch" class="col-sm-2 col-form-label">Branch</label>
  <div class="col-sm-10">
   <input type="text" class="form-control" id="bbranch" placeholder="Branch"</pre>
name="bbranch" required>
  </div>
  {% if flag branch %}
   {{msg|lower}}
  {% endif %}
 </div>
```



```
{% csrf token %}
  <center><button type="submit" class="btn btn-success" id="add book">Add
Book</button></center>
</form>
<script type="text/javascript">
 $("#add book").on('dblclick',function(){
  alert('If you filled all details then your details is submitted')
 })
</script>
{% endblock %}
<!DOCTYPE html>
{% extends "Book/base.html" %}
{% load staticfiles %}
 {% block head %}
  <style>
   img{
    height:200px;
   h5,span{
    color:white;
  </style>
 {% endblock %}
{% block logout %} <a class="nav-link" href="/accounts/logout"><button type="button"
class="btn btn-outline-success">Logout</button></a> {% endblock %}
{% block home %} <a class="nav-link" href="/Book/after login home"><button type="button"
class="btn btn-outline-success">Home <span class="sr-only">(current)</span></button></a>
{% endblock %}
{% block dropdown %}
<a class="nav-link dropdown-toggle" href="#" id="navbarDropdown" role="button"
data-toggle="dropdown" aria-haspopup="true" aria-expanded="false" style="border-left:red
```



```
solid 2px;border-right:red solid 2px;border-radius:50%;">
  <b>{{login user|upper}}</b>
</a>
<div class="dropdown-menu" aria-labelledby="navbarDropdown">
 <a class="dropdown-item" href="/Book/uploaded book">Books</a>
 <div class="dropdown-divider"></div>
 <a class="dropdown-item" href="/accounts/logout">Logout</a>
</div>
{% endblock %}
{% block search %}
 <form class="form-inline my-2 my-lg-0" method="post">
  <input class="form-control mr-sm-2" type="search" placeholder="book name,semester"</pre>
name="search" aria-label="Search">
  <button class="btn btn-outline-success my-2 my-sm-0" type="submit">Search</button>
  {% csrf token %}
 </form>
{% endblock %}
{% block body %}
<div class="row my-2 jumbotron" style="background-color:rgba(235, 254, 255,0);">
 {% if books %}
 {% for book in books %}
 <div class="col-sm mx-2 my-3">
  <div class="card" style="width: 18rem;border-radius:50%;">
    \{\% \text{ if book.semester} == 1 \%\}
    <img src="{% static "image/sem1.png" %}" class="card-img-top" alt="...">
    \{\% \text{ elif book.semester} == 2 \%\}
   <img src="{% static "image/sem2.png" %}" class="card-img-top" alt="...">
    \{\% \text{ elif book.semester} == 3 \%\}
   <img src="{% static "image/sem3.png" %}" class="card-img-top" alt="..."</pre>
style="border-radius:50%;">
    {% elif book.semester == 4 %}
    <img src="{% static "image/sem4.png" %}" class="card-img-top" alt="...">
    \{\% \text{ elif book.semester} == 5 \%\}
    <img src="{% static "image/sem5.png" %}" class="card-img-top" alt="...">
    \{\% \text{ elif book.semester} == 6 \%\}
    <img src="{% static "image/sem6.png" %}" class="card-img-top" alt="...">
    \{\% \text{ elif book.semester} == 7 \%\}
    <img src="{% static "image/sem7.png" %}" class="card-img-top" alt="...">
    {% elif book.semester == 8 %}
    <img src="{% static "image/sem8.png" %}" class="card-img-top" alt="...">
    {% endif %}
```



```
<div class="card-body">
    <h5 class="card-title">{{book.bname|upper}}</h5>
    AUTHOR : <span>{{book.bauthor|upper}}</span>
    SEMESTER : <span>{{book.semester}}</span>
    BRANCH : <span>{{book.branch}}</span>
    <a href="/Book/borrow/{{book.id}}"><button type="button" class="btn"
btn-warning">Borrow</button></a>
   </div>
  </div>
 </div>
 {% endfor %}
 {% else %}
 <h1 class="container jumbotron">No Books Are Available...</h1>
 {% endif %}
</div><br><br>>
{% endblock %}
{% extends "Book/base.html" %}
{% load staticfiles %}
{% block logout %} <a class="nav-link" href="/accounts/logout"><button type="button"
class="btn btn-outline-success">Logout</button></a> {% endblock %}
{% block home %} <a class="nav-link" href="/Book/after login home"><button type="button"
class="btn btn-outline-success">Home <span class="sr-only">(current)</span></button></a>
{% endblock %}
{% block dropdown %}
<a class="nav-link dropdown-toggle" href="#" id="navbarDropdown" role="button"
data-toggle="dropdown" aria-haspopup="true" aria-expanded="false" style="border-left:red
solid 2px;border-right:red solid 2px;border-radius:50%;">
  <b>{{login user|upper}}</b>
</a>
<div class="dropdown-menu" aria-labelledby="navbarDropdown">
 <a class="dropdown-item" href="/Book/uploaded_book">Books</a>
 <div class="dropdown-divider"></div>
 <a class="dropdown-item" href="/accounts/logout">Logout</a>
</div>
{% endblock %}
{% block head %}
```



```
<style>
  img{
   height:300px;
   width:300px;
   padding:60px;
 </style>
{% endblock %}
{% block body %}
<br>
<div class="jumbotron mx-5" style="background-color:rgba(0,0,0,0);">
 <div class="row my-4">
  <a href="/Book/after login book list/{{sem}}/cse">
   <div class="card" style="width: 26rem;border-radius:50%;">
    <img src="{% static 'image/cse.png' %}" class="card-img-top" alt="...">
   </div>
  </a>&nbsp&nbsp&nbsp&nbsp&nbsp
  <a href="/Book/after login book list/{{sem}}/ise">
   <div class="card" style="width: 26rem;border-radius:50%;">
    <img src="{% static 'image/ise.png' %}" class="card-img-top" alt="...">
   </div>
  </a>&nbsp&nbsp&nbsp&nbsp&nbsp
  <a href="/Book/after login book list/{{sem}}/eee">
   <div class="card" style="width: 26rem;border-radius:50%;">
    <img src="{% static 'image/eee.jpg' %}" class="card-img-top" alt="...">
   </div>
  </a>&nbsp&nbsp&nbsp&nbsp&nbsp
 </div>
 <div class="row my-4">
  <a href="/Book/after login book list/{{sem}}/ece">
   <div class="card" style="width: 26rem;border-radius:50%;">
    <img src="{% static 'image/ece.jfif' %}" class="card-img-top" alt="...">
   </div>
  </a>&nbsp&nbsp&nbsp&nbsp&nbsp
  <a href="/Book/after login book list/{{sem}}/me">
   <div class="card" style="width: 26rem;border-radius:50%;">
    <img src="{% static 'image/me.jpg' %}" class="card-img-top" alt="...">
   </div>
```



```
</a>&nbsp&nbsp&nbsp&nbsp&nbsp
  <a href="/Book/after login book list/{{sem}}/ce">
   <div class="card" style="width: 26rem;border-radius:50%;">
    <img src="{% static 'image/ce.jpg' %}" class="card-img-top" alt="...">
   </div>
  </a>&nbsp&nbsp&nbsp&nbsp&nbsp
 </div>
</div>
{% endblock %}
<!DOCTYPE html>
{% extends 'Book/base.html' %}
{% load staticfiles %}
{% block logout %} <a class="nav-link" href="/accounts/logout"><button type="button"
class="btn btn-outline-success">Logout</button></a> {% endblock %}
{% block home %} <a class="nav-link" href="/Book/after login home"><button type="button"
class="btn btn-outline-success">Home <span class="sr-only">(current)</span></button></a>
{% endblock %}
{% block dropdown %}
<a class="nav-link dropdown-toggle" href="#" id="navbarDropdown" role="button"
data-toggle="dropdown" aria-haspopup="true" aria-expanded="false" style="border-left:red
solid 2px;border-right:red solid 2px;border-radius:50%;">
 <b>{{login user|upper}}</b>
</a>
<div class="dropdown-menu" aria-labelledby="navbarDropdown">
 <a class="dropdown-item" href="/Book/uploaded book">Books</a>
 <div class="dropdown-divider"></div>
 <a class="dropdown-item" href="/accounts/logout">Logout</a>
</div>
{% endblock %}
{% block body %}
<div class="jumbotron" style="background-color:rgba(0,0,0,0);">
```



```
<div class="row my-4">
  <div class=" col-md-6 col-lg-3">
   <a href="/Book/after login book list/1">
     <div class="col-sm mx-5">
      <div class="card" style="width: 18rem; border-radius:50%;">
       <img src="{% static 'image/sem1.png' %}" class="card-img-top" alt="...">
       <div class="card-body">
        <!-- <button class="btn btn-outline-secondary"><h4 style="color:black;">SEMESTER
I</h3></button> -->
       </div>
      </div>
    </div>
   </a>
  </div>
  <div class=" col-md-6 col-lg-3">
   <a href="/Book/after login book list/2">
    <div class="col-sm">
      <div class="card" style="width: 18rem; border-radius:50%;">
       <img src="{% static 'image/sem2.png' %}" class="card-img-top" alt="...">
       <div class="card-body">
        <!-- <button class="btn btn-outline-secondary"><h3 style="color:black;">SEMESTER
II</h3></button> -->
       </div>
      </div>
    </div>
   </a>
  </div>
  <div class=" col-md-6 col-lg-3">
   <a href="/Book/after login branch/3">
    <div class="col-sm">
      <div class="card" style="width: 18rem;border-radius:50%">
       <img src="{% static 'image/sem3.png' %}" class="card-img-top" alt="..."</pre>
style="border-radius:50%;">
       <div class="card-body">
        <!-- <button class="btn btn-outline-secondary"><h3 style="color:black;">SEMESTER
III</h3></button> -->
       </div>
      </div>
    </div>
   </a>
  </div>
  <div class=" col-md-6 col-lg-3">
   <a href="/Book/after login branch/4">
    <div class="col-sm">
      <div class="card" style="width: 18rem;border-radius:50%;">
       <img src="{% static 'image/sem4.png' %}" class="card-img-top" alt="...">
       <div class="card-body">
        <!-- <button class="btn btn-outline-secondary"><h3 style="color:black;">SEMESTER
```



```
IV</h3></button> -->
      </div>
     </div>
    </div>
   </a>
  </div>
 </div>
 <div class="row my-4">
  <div class=" col-md-6 col-lg-3">
   <a href="/Book/after login branch/5">
    <div class="col-sm mx-5">
      <div class="card" style="width: 18rem;border-radius:50%;">
       <img src="{% static 'image/sem5.png' %}" class="card-img-top" alt="...">
       <div class="card-body">
        <!-- <button class="btn btn-outline-secondary"><h3 style="color:black;">SEMESTER
V</h3></button> -->
      </div>
     </div>
    </div>
   </a>>
  </div>
  <div class=" col-md-6 col-lg-3">
   <a href="/Book/after login branch/6">
    <div class="col-sm">
      <div class="card" style="width: 18rem;border-radius:50%;">
       <img src="{% static 'image/sem6.png' %}" class="card-img-top" alt="...">
       <div class="card-body">
        <!-- <button class="btn btn-outline-secondary"><h3 style="color:black;">SEMESTER
VI</h3></button> -->
       </div>
     </div>
    </div>
   </a>>
  </div>
  <div class=" col-md-6 col-lg-3">
   <a href="/Book/after login branch/7">
    <div class="col-sm">
      <div class="card" style="width: 18rem;border-radius:50%;">
       <img src="{% static 'image/sem7.png' %}" class="card-img-top" alt="...">
       <div class="card-body">
        <!-- <button class="btn btn-outline-secondary"><h3 style="color:black;">SEMESTER
VII</h3></button> -->
       </div>
     </div>
    </div>
   </a>
  </div>
```



```
<div class=" col-md-6 col-lg-3">
   <a href="/Book/after login branch/8">
    <div class="col-sm">
      <div class="card" style="width: 18rem;border-radius:50%;">
       <img src="{% static 'image/sem8.png' %}" class="card-img-top" alt="...">
       <div class="card-body">
        <!-- <button class="btn btn-outline-secondary"><h3 style="color:black;">SEMESTER
VIII</h3></button> -->
       </div>
     </div>
    </div>
   </a>
  </div>
 </div>
</div>
{% endblock %}
<!DOCTYPE html>
{% load staticfiles %}
<html lang="en" dir="ltr">
 <head>
  <meta charset="utf-8">
  <!-- link of bootstrapedn 4.3 -->
  link rel="stylesheet"
href="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/css/bootstrap.min.css"
integrity="sha384-ggOyR0iXCbMQv3Xipma34MD+dH/1fQ784/j6cY/iJTQUOhcWr7x9JvoRxT
2MZw1T" crossorigin="anonymous">
  k rel="stylesheet" href="{% static 'css/base.css' %}">
  <script src="https://code.jquery.com/jquery-3.3.1.slim.min.js"</pre>
integrity="sha384-q8i/X+965DzO0rT7abK41JStQIAqVgRVzpbzo5smXKp4YfRvH+8abtTE1Pi
6jizo" crossorigin="anonymous"></script>
  <script src="https://cdnjs.cloudflare.com/ajax/libs/popper.js/1.14.7/umd/popper.min.js"</pre>
integrity="sha384-UO2eT0CpHqdSJQ6hJty5KVphtPhzWj9WO1clHTMGa3JDZwrnQq4sF86dI
HNDz0W1" crossorigin="anonymous"></script>
  <script src="https://stackpath.bootstrapcdn.com/bootstrap/4.3.1/js/bootstrap.min.js"</pre>
integrity="sha384-JjSmVgyd0p3pXB1rRibZUAYoIIy6OrQ6VrjIEaFf/nJGzIxFDsf4x0xIM+B07j
RM" crossorigin="anonymous"></script>
  {% block head %} {% endblock %}
  <style>
  * {
   margin: 0;
   padding: 0;
```



```
box-sizing: border-box;
   font-family: sans-serif;
  *::-webkit-scrollbar{
   width: 0px;
  .card{
   background-color:red;
   font-style: italic;
  button{
   font-style: italic;
  </style>
  <title></title>
 </head>
 <body style="background-image:</pre>
url('https://hips.hearstapps.com/hmg-prod.s3.amazonaws.com/images/book-quotes-1531945007.j
pg?crop=1.00xw:0.753xh;0,0.247xh&resize=980:*');background-repeat:
no-repeat; background-size: cover;" >
  <!-- navbar -->
  <nav class="navbar navbar-expand-lg navbar-light fixed-top" style="background:white">
   <a class="navbar-brand" href="/"><button type="button" class="btn btn-danger"
style="border:red 8px solid;border-radius:50%;">CMRIT BOOK BANK</button></a>
   <button class="navbar-toggler" type="button" data-toggle="collapse"</p>
data-target="#navbarSupportedContent" aria-controls="navbarSupportedContent"
aria-expanded="false" aria-label="Toggle navigation">
    <span class="navbar-toggler-icon"></span>
   </button>
   <div class="collapse navbar-collapse" id="navbarSupportedContent">
    ul class="navbar-nav mr-auto">
     {% block home %} {% endblock %}
      <!-- <a class="nav-link" href="/Book">Home <span
class="sr-only">(current)</span></a> -->
     <a class="nav-link" href="/Notes"><button type="button" class="btn
btn-outline-success">Notes</button></a>
     {% block dropdown %} {% endblock %}
```

{% load staticfiles %}



```
class="nav-item">
      {% block uploaded_book %} {% endblock %}
      <!-- <a class="nav-link" href="#">About Us</a> -->
     {% block search %} {% endblock %}
    ul class="navbar-nav mx-2">
    <a href="/Book/add book"><button type="button" class="btn btn-outline-primary">Add
Book</button></a>
    class="nav-item">
     {% block login %} {% endblock %}
     <!-- <a class="nav-link" href="/accounts/login">Login</a> -->
    {% block sign_up %} {% endblock %}
     <!-- <a class="nav-link" href="/Book/sign_up">Sign_Up</a> -->
    cli class="nav-item">
     {% block logout %} {% endblock %}
     <!-- <a class="nav-link" href="/accounts/logout">Logout</a> -->
    </div>
  </nav>
<!-- body block for their child -->
  <div class="my-4">
   {% block body %}
   {% endblock %}
  </div>
 </body>
</html>
<!DOCTYPE html>
{% extends 'Book/base.html' %}
```



```
{% block logout %} <a class="nav-link" href="/accounts/logout"><button type="button" class="btn"
btn-outline-success">Logout</button></a> {% endblock %}
{% block home %} <a class="nav-link" href="/Book/after login home"><button type="button"
class="btn btn-outline-success">Home <span class="sr-only">(current)</span></button></a> {%
endblock %}
{% block dropdown %}
<a class="nav-link dropdown-toggle" href="#" id="navbarDropdown" role="button"
data-toggle="dropdown" aria-haspopup="true" aria-expanded="false" style="border-left:red solid
2px;border-right:red solid 2px;border-radius:50%;">
  <b>{{login user|upper}}</b>
</a>>
<div class="dropdown-menu" aria-labelledby="navbarDropdown">
 <a class="dropdown-item" href="/Book/uploaded book">Books</a>
 <div class="dropdown-divider"></div>
 <a class="dropdown-item" href="/accounts/logout">Logout</a>
</div>
{% endblock %}
{% block head %}
<style>
.left{
 width:30%;
 float: left;
.right{
 width:50%;
 float:right;
 margin-left:20px;
h5,span{
 color:white;
body{
 font-style: italic;
</style>
{% endblock %}
{% block body %}
<hr><hr><hr><hr><hr><
<div class="container my-3">
 <div class="left mx-4">
  <div class="card my-5" style="width: 18rem;border-radius:50%;">
```



```
\{\% \text{ if book.semester} == 1 \%\}
   <img src="{% static "image/sem1.png" %}" class="card-img-top" alt="...">
   \{\% \text{ elif book.semester} == 2 \%\}
   <img src="{% static "image/sem2.png" %}" class="card-img-top" alt="...">
   {% elif book.semester == 3 %}
   <img src="{% static "image/sem3.png" %}" class="card-img-top" alt="..."</pre>
style="border-radius:50%;">
   {% elif book.semester == 4 %}
   <img src="{% static "image/sem4.png" %}" class="card-img-top" alt="...">
   {% elif book.semester == 5 %}
   <img src="{% static "image/sem5.png" %}" class="card-img-top" alt="...">
   \{\% \text{ elif book.semester} == 6 \%\}
   <img src="{% static "image/sem6.png" %}" class="card-img-top" alt="...">
   \{\% \text{ elif book.semester} == 7 \%\}
   <img src="{% static "image/sem7.png" %}" class="card-img-top" alt="...">
   {% elif book.semester == 8 %}
   <img src="{% static "image/sem8.png" %}" class="card-img-top" alt="...">
   {% endif %}
   <div class="card-body">
     <h5 class="card-title">{{book.bname|upper}}</h5>
     AUTHOR : <span>{{book.bauthor|upper}}</span>
     SEMESTER : <span>{{book.semester}}</span>
     BRANCH : <span>{{book.branch}}</span>
   </div>
  </div>
 </div>
 <div class="right">
  <h4>Contact Details Of Book Holder</h4><hr><br>
  <button type="button" class="btn btn-outline-success btn-lg</pre>
btn-block">{{book.buser.first name|upper}}</button>
  <button type="button" class="btn btn-outline-success btn-lg</pre>
btn-block">{{user.mobile no|upper}}</button>
  <button type="button" class="btn btn-outline-success btn-lg</pre>
btn-block">{{user.address1|upper}}</button>
  <button type="button" class="btn btn-outline-success btn-lg</pre>
btn-block">{{user.address2|upper}}</button>
  <br/><br/><br/><br/><br/><br/><br/>Contact <span style="color:red">{{book.buser.first name|upper}}</span> for more
details...</b></h5>
  <h5><b>And if <span style="color:red">{{book.buser.first name|upper}}</span> agree to give, then
click on below button</b></h5><br
  <a href="/Book/book taken/{{book.id}}"><button type="submit" class="btn btn-warning btn-lg
btn-block"><span style="color:red">{{book.buser.first_name|upper}}</span> Agree To Give
Book???</button></a>
 </div>
</div>
{% endblock %}
```



```
<!DOCTYPE html>
{% extends "Book/base.html" %}
{% load staticfiles %}
{% block head %}
 <style>
  img{
   height:200px;
 h5,span{
  color:white;
 </style>
{% endblock %}
{% block login %} <a class="nav-link" href="/accounts/login"><button type="button" class="btn
btn-outline-success">Login</button></a> {% endblock %}
{% block sign up %} <a class="nav-link" href="/Book/sign up"><button type="button" class="btn
btn-outline-success">Sign Up</button></a> {% endblock %}
{% block home %} <a class="nav-link" href="/Book"><button type="button" class="btn
btn-outline-success">Home <span class="sr-only">(current)</span></button></a> {% endblock %}
{% block search %}
<form class="form-inline my-2 my-lg-0" method="post">
 <input class="form-control mr-sm-2" type="search" placeholder="book name,semester" name="search"</pre>
aria-label="Search">
 <button class="btn btn-outline-success my-2 my-sm-0" type="submit">Search</button>
 {% csrf token %}
</form>
{% endblock %}
{% block body %}
<div class="row my-2 jumbotron" style="background-color:rgba(235, 254, 255,0);">
 {% if books %}
 {% for book in books %}
 <div class="col-sm mx-2 my-3">
  <div class="card" style="width: 18rem;border-radius:50%">
   \{\% \text{ if book.semester} == 1 \%\}
   <img src="{% static "image/sem1.png" %}" class="card-img-top" alt="...">
   \{\% \text{ elif book.semester} == 2 \%\}
   <img src="{% static "image/sem2.png" %}" class="card-img-top" alt="...">
   {% elif book.semester == 3 %}
   <img src="{% static "image/sem3.png" %}" class="card-img-top" alt="..."</pre>
```



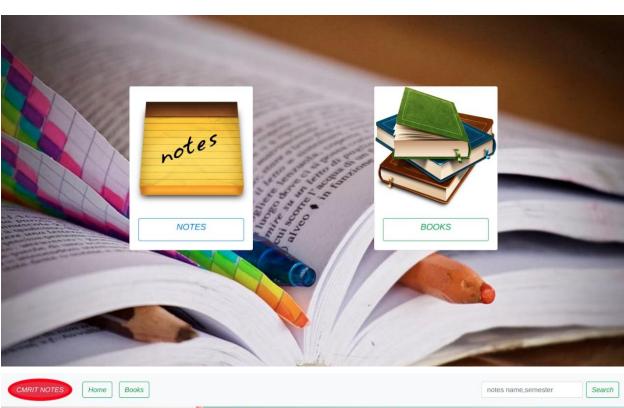
```
style="border-radius:50%;">
   \{\% \text{ elif book.semester} == 4 \%\}
   <img src="{% static "image/sem4.png" %}" class="card-img-top" alt="...">
   \{\% \text{ elif book.semester} == 5 \%\}
   <img src="{% static "image/sem5.png" %}" class="card-img-top" alt="...">
   \{\% \text{ elif book.semester} == 6 \%\}
   <img src="{% static "image/sem6.png" %}" class="card-img-top" alt="...">
   \{\% \text{ elif book.semester} == 7 \%\}
   <img src="{% static "image/sem7.png" %}" class="card-img-top" alt="...">
   {% elif book.semester == 8 %}
   <img src="{% static "image/sem8.png" %}" class="card-img-top" alt="...">
   {% endif %}
   <div class="card-body">
    <h5 class="card-title">{{book.bname|upper}}</h5>
    AUTHOR : <span>{{book.bauthor|upper}}</span>
    SEMESTER : <span>{{book.semester}}</span>
    BRANCH : <span>{{book.branch}}</span>
    <a href="/Book/borrow/{{book.id}}"><button type="button" class="btn"
btn-warning">Borrow</button></a>
   </div>
  </div>
 </div>
 {% endfor %}
 {% else %}
 <h1 class="container jumbotron">No Books Are Available...</h1>
 {% endif %}
</div><br><br>>
{% endblock %}
{% extends "Book/base.html" %}
{% load staticfiles %}
{% block head %}
 <style>
  img{
   height:300px;
   width:300px;
   padding:60px;
 </style>
{% endblock %}
{% block login %} <a class="nav-link" href="/accounts/login"><button type="button" class="btn
```



btn-outline-success">Login</button> {% endblock %} {% block sign up %} <button type="button" class="btn btn-outline-success">Sign Up</button> {% endblock %} {% block home %} <button type="button" class="btn btn-outline-success">Home (current)</button> {% endblock %} {% block body %}
<div class="jumbotron mx-5" style="background-color:rgba(0,0,0,0);"> <div class="row my-4"> <div class="card" style="width: 26rem;border-radius:50%;"> <div class="card" style="width: 26rem;border-radius:50%;"> </div> <div class="card" style="width: 26rem;border-radius:50%;"> </div> </div> <div class="row my-4"> <div class="card" style="width: 26rem;border-radius:50%;"> </div> <div class="card" style="width: 26rem;border-radius:50%;"> </div> <div class="card" style="width: 26rem;border-radius:50%;">



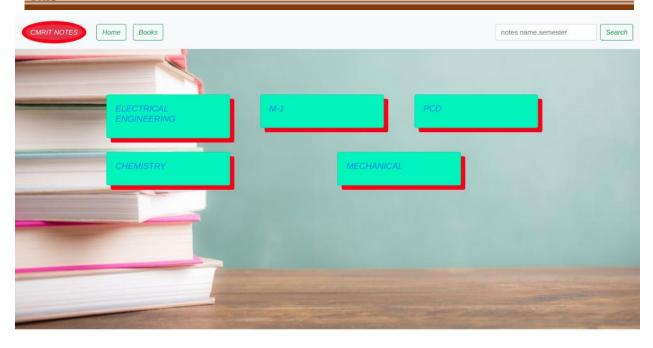
Screenshots

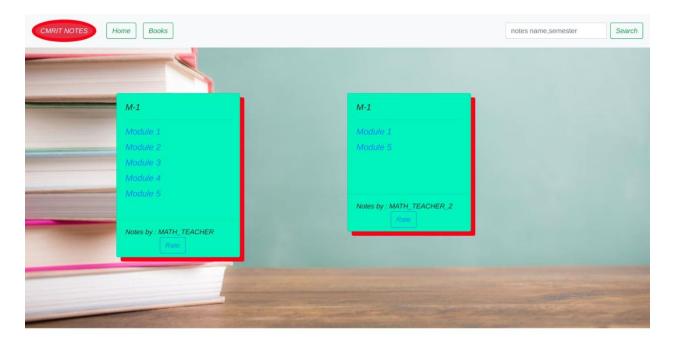






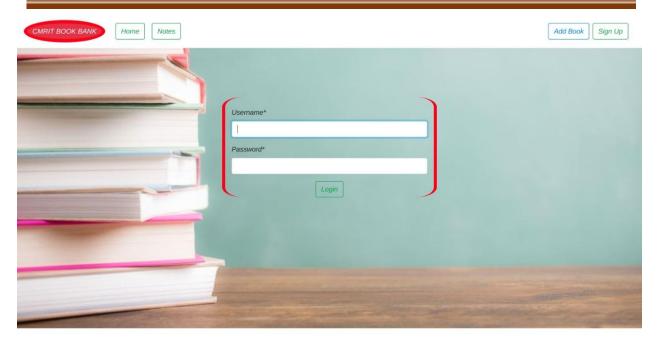
Title

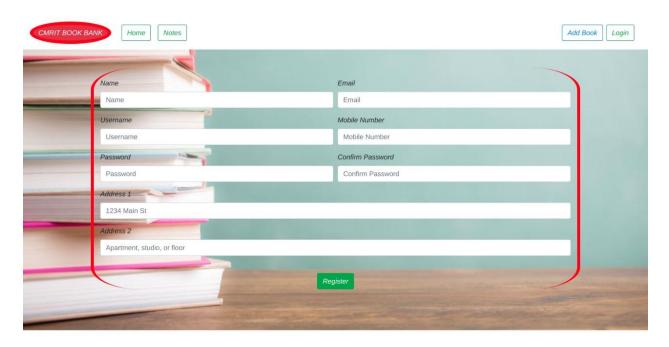






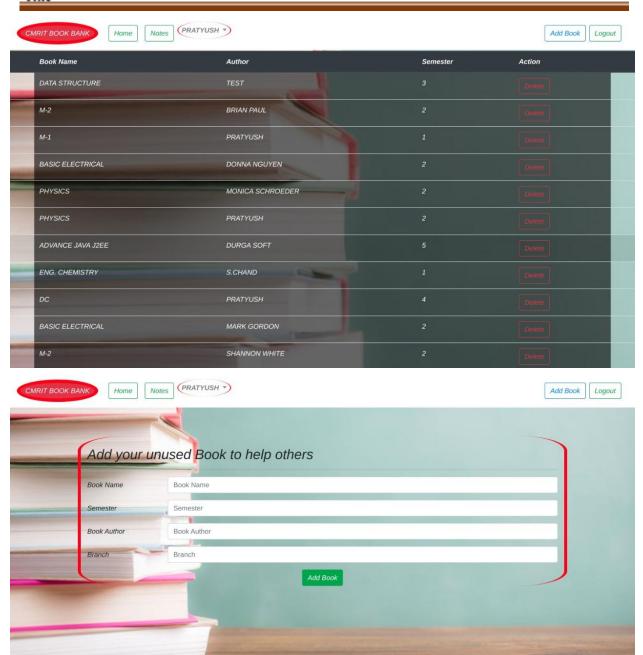
Title



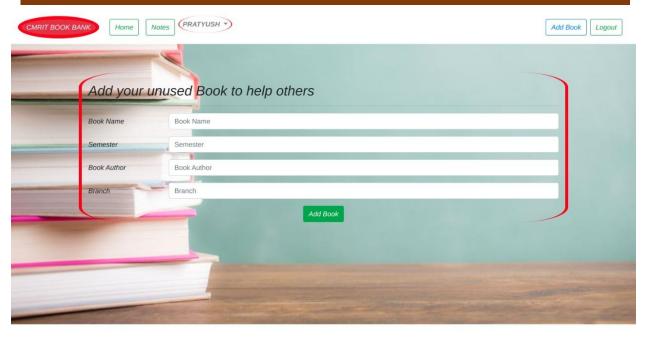


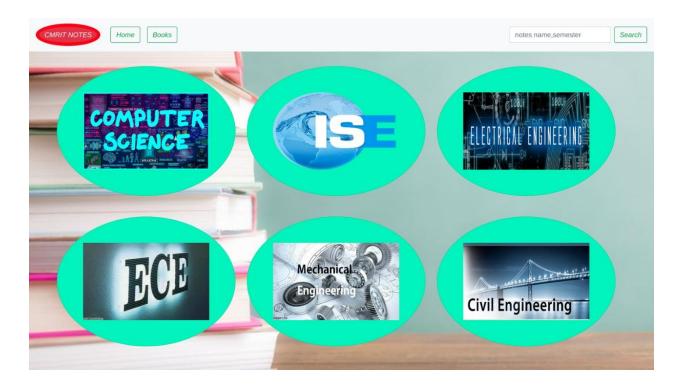






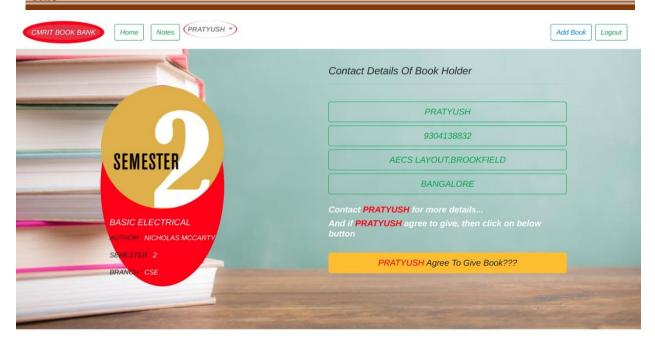


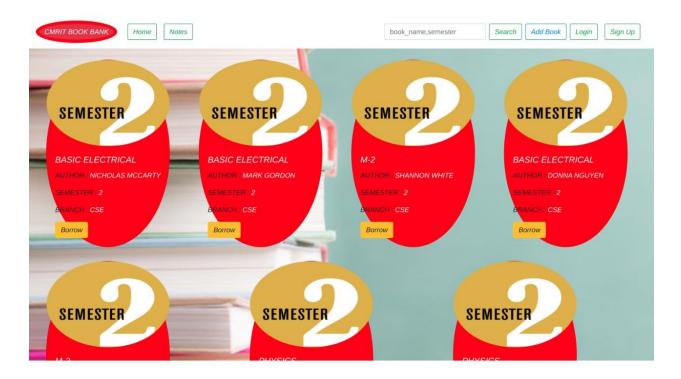






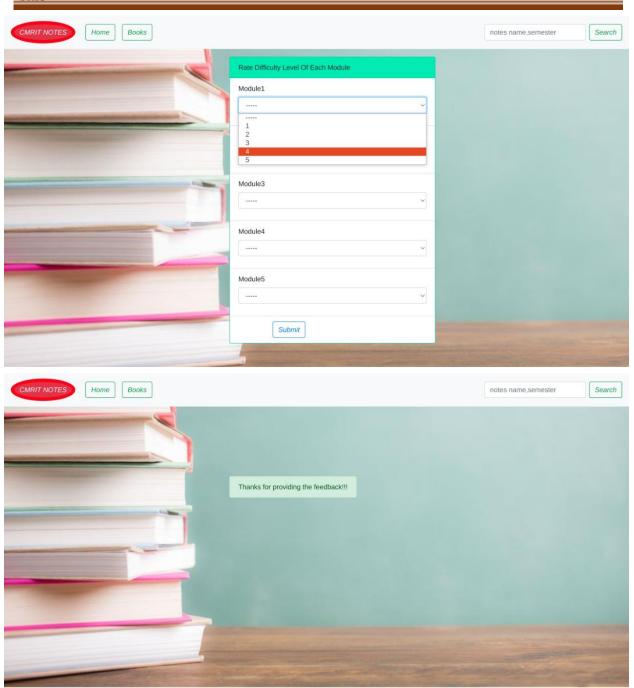








Title





Conclusion

To conclude, our project aimed at building and comparing models that are able to detect botnets in a real network traffic represented by Netflow datasets. After a strong analysis of the data and a lot of reviews of network security papers, relevant features were extracted. Their influence were then studied through a selection process but no feature was poor enough to be left aside for the training part.

The use of a bootstrap method to increase the amount of data has resulted in detecting more than 55% of the scenarios 5, 7 and 11. Only the scores of the scenarios 4 and 12 were difficult to improve

The possible improvement of the work presented here would be to try to modify the extracted features with different widths and strides for the time window and explore more hyperparameters for the difficult scenarios. Another idea would be to try to train and test several scenarios at the same time. Finally, unsupervised learning can be tested to detect the behavior of botnets without using the labels of the data.

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