CHAPTER-9

APPENDICES

9.1 APPENDIX-A: SAMPLE SOURCE CODE

Main.py

```
from django.http import HttpResponse
from django.shortcuts import get_object_or_404, render, redirect
from django.contrib.auth.models import User
from django.contrib.auth import login,authenticate,logout
from django.contrib.auth.decorators import login_required
from django.contrib import messages
from .models import EvaluationResult, ExamSubmission,Exam
from .evaluation.ocr import generate_ocr
from .evaluation.extract_question_answerkey import question_answer_content
from .evaluation.preprocess_ocr import preprocess_ocr_question_wise
from .evaluation.evalution import evaluate_exam_with_ocr_to_json
from .evaluation.report import generate_report
from.evaluation.proper_json import parse_json_string
import json

def home(request):
    return render(request, 'home.html')

def signup_view(request):
    if request.method == "POST":
        username = request.POST['username']
        email = request.POST['email']
        password1 = request.POST['password1']
        password2 = request.POST['password2']

        if password1 != password2:
            messages.error(request, "Passwords do not match!")
            return redirect('signup')

        if User.objects.filter(username=username).exists():
            messages.error(request, "Username already taken!")
            return redirect('signup')

        if User.objects.filter(email=email).exists():
            messages.error(request, "Email is already in use!")
            return redirect('signup')

        user = User.objects.create_user(username=username, email=email, password=password1)
        login(request, user)
```

```
            messages.success(request, "Account created successfully!")
            return redirect('login')

        return render(request, 'authentication/signup.html')

def login_view(request):
    if request.method == "POST":
        username = request.POST['username']
        password = request.POST['password']
        user = authenticate(request, username=username, password=password)

        if user is not None:
            login(request, user)
            messages.success(request, "Login successful!")
            return redirect('student_dashboard')
        else:
            messages.error(request, "Invalid username or password!")

    return render(request, 'authentication/login.html')

def student_dashboard(request):
    exams = ExamSubmission.objects.filter(student=request.user)  # Fetch exams created by
logged-in student
    return render(request, 'dashboard/student/student_dashboard.html', {'exams': exams})

def logout_view(request):
    logout(request)
    messages.success(request, "Logged out successfully!")
    return redirect('login')

def student_exam_fill(request):
    if request.method == "POST":
        subject = request.POST.get("subject")
        exam_type = request.POST.get("exam_type")
        year = request.POST.get("year")
        staff_name = request.POST.get("staff_name")

        # Check if an exam exists with these details
        exam = Exam.objects.filter(year=year).first()

        if not exam:
            messages.error(request, "❌ No matching exam found. Please check the details.")
            return redirect("student_exam_fill")  # Prevent saving if exam doesn't exist

        # Create a new submission linked to this exam
        submission = ExamSubmission.objects.create(
```

```
            exam=exam,  # Assigning the required exam field
            student=request.user,
            subject=subject,
    if request.method == "POST":
        subject = request.POST.get("subject")
        exam_type = request.POST.get("exam_type")
        year = request.POST.get("year")
        staff_name = request.POST.get("staff_name")            exam_type=exam_type,
            year=year,
            staff_name=staff_name,
        )

        messages.success(request, "✅ Exam submission successful!")
        return redirect("student_dashboard")

    return render(request, "dashboard/student/exam_fill.html")

def teacher_login(request):
    if request.method == "POST":
        username = request.POST["username"]
        password = request.POST["password"]
        user = authenticate(request, username=username, password=password)

        if user is not None:
            if user.is_superuser:  # Allow only superusers
                login(request, user)
                messages.success(request, "Welcome, Teacher!")
                return redirect("teacher_dashboard")  # Redirect to teacher dashboard
            else:
                messages.error(request, "Access Denied! Only teachers (superusers) can log in.")
        else:
            messages.error(request, "Invalid Username or Password!")

    return render(request, "dashboard/teacher/teacher_login.html")

@login_required
def teacher_dashboard(request):
    if not request.user.is_superuser:
        return redirect("home")  # Redirect unauthorized users

    exams = Exam.objects.all().order_by("-id")  # Fetch all exams
    return render(request, "dashboard/teacher/teacher_dashboard.html", {"exams": exams})

@login_required
def create_exam(request):
    if not request.user.is_superuser:
```

```
        messages.error(request, "❌ Unauthorized access!")
        return redirect("home")


        question_paper = request.FILES.get("question_paper")
        answer_key = request.FILES.get("answer_key")

        if not all([subject, exam_type, year, staff_name, question_paper, answer_key]):
            messages.error(request, "⚠️ All fields are required!")
            return redirect("create_exam")

        Exam.objects.create(
            subject=subject,
            exam_type=exam_type,
            year=year,
            staff_name=staff_name,
            question_paper=question_paper,
            answer_key=answer_key
        )

        messages.success(request, "✅ Exam successfully created!")
        return redirect("teacher_dashboard")

    return render(request, "dashboard/teacher/create_exam.html")

@login_required
def view_submissions(request, exam_id):
    exam = get_object_or_404(Exam, id=exam_id)
    submissions = ExamSubmission.objects.filter(year=exam.year)

    if request.method == "POST":
        for submission in submissions:
            file_field_name = f"answer_sheet_{submission.id}"
            if file_field_name in request.FILES:
                if submission.answer_sheet:
                    messages.warning(request, f"⚠️ Answer sheet for {submission.student.username}
already uploaded.")
                else:
                    submission.answer_sheet = request.FILES[file_field_name]
                    submission.save()
                    messages.success(request, f"✅ Answer sheet uploaded for
{submission.student.username}.")

        return redirect('view_submissions', exam_id=exam.id)
```

```
    return render(request, "dashboard/teacher/view_submissions.html", {"exam": exam,
"submissions": submissions})

def evaluate_submission_view(request, submission_id):
    submission = get_object_or_404(ExamSubmission, id=submission_id)

    # 🔍 Check if the submission is already evaluated
    # Render the evaluation results page
    return render(request, 'dashboard/teacher/evaluate_submission.html', {
        'submission': submission,
        'formatted_report': formatted_report,
        'total_score': total_score,
        'max_score': max_score
    })     evaluation = EvaluationResult.objects.filter(submission=submission).first()

    if evaluation:
        messages.info(request, "This submission has already been evaluated.")
        formatted_report = parse_json_string(evaluation.formatted_report)

        total_score = evaluation.total_score
        max_score = evaluation.max_score
    else:
        #OCR text from uploaded answer sheet
        ocr_text = generate_ocr(submission.answer_sheet.path)

        # Extract question paper and answer key
        question_paper_text = question_answer_content(submission.exam.question_paper.path)
        answer_key_text = question_answer_content(submission.exam.answer_key.path)

        # Preprocess OCR text to align with question numbers
        structured_ocr_text = preprocess_ocr_question_wise(ocr_text, question_paper_text)

        # Evaluate answers using Gemini API
        evaluation_result_json = evaluate_exam_with_ocr_to_json(structured_ocr_text,
answer_key_text)

        formatted_report = generate_report(evaluation_result_json)
        formatted_report = parse_json_string(formatted_report)
        print(formatted_report)
        total_score = formatted_report["summary"]["user_total_score"]
        max_score =  formatted_report["summary"]["total_possible_score"]

        # Save the evaluation result in the database
        evaluation = EvaluationResult.objects.create(
            submission=submission,
            evaluated_by=request.user,
```

```
            formatted_report=json.dumps(formatted_report),
            total_score=total_score,
            max_score=max_score,
        )
        submission.is_graded = True
        submission.save()

        messages.success(request, "Evaluation completed successfully!")



def view_results(request,exam_id):
    submission = get_object_or_404(ExamSubmission, id=exam_id)

    # Check if the submission is already evaluated
    evaluation = EvaluationResult.objects.filter(submission=submission).first()

    if evaluation:
        messages.info(request, "This submission has already been evaluated.")
        formatted_report = parse_json_string(evaluation.formatted_report)

        total_score = evaluation.total_score
        max_score = evaluation.max_score

    return render(request, 'dashboard/teacher/evaluate_submission.html', {
        'submission': submission,
        'formatted_report': formatted_report,
        'total_score': total_score,
        'max_score': max_score
    })
```

Urls.py

```
from django.contrib import admin
from django.urls import path
from app import views
from django.conf import settings
from django.conf.urls.static import static

urlpatterns = [
    path("admin/", admin.site.urls),
    path('', views.home, name='home'),
    path('signup/', views.signup_view, name='signup'),
    path('login/', views.login_view, name='login'),
    path('logout/', views.logout_view, name='logout'),
    path('student_dashboard/', views.student_dashboard, name='student_dashboard'),
    path('view-results/<int:exam_id>/', views.view_results, name='view_results'),
```

```
    path('student_exam_fill/', views.student_exam_fill, name='student_exam_fill'),
    path('teacher-login/', views.teacher_login, name='teacher_login'),
    path('teacher-dashboard/', views.teacher_dashboard, name='teacher_dashboard'),
    path('create-exam/', views.create_exam, name='create_exam'),
    path('view-submissions/<int:exam_id>/', views.view_submissions, name='view_submissions'),
    path('evaluate/<int:submission_id>/', views.evaluate_submission_view,
name='evaluate_submission'),
]+ static(settings.MEDIA_URL,document_root=settings.MEDIA_ROOT)

urlpatterns+= static(settings.STATIC_URL,document_root=settings.STATIC_ROOT)
```

Models.py

```
from django.db import models
from django.contrib.auth.models import User

class Exam(models.Model):
    YEAR_CHOICES = [
        (1, "First Year"),
        (2, "Second Year"),
        (3, "Third Year"),
        (4, "Fourth Year"),
    ]

    EXAM_TYPE_CHOICES = [
        ("CAT1", "CAT 1"),
        ("CAT2", "CAT 2"),
    ]

    subject = models.CharField(max_length=255)
    exam_type = models.CharField(max_length=4, choices=EXAM_TYPE_CHOICES,
default="CAT1")
    year = models.IntegerField(choices=YEAR_CHOICES)
    staff_name = models.CharField(max_length=255)
    question_paper = models.FileField(upload_to='question_papers/')
    answer_key = models.FileField(upload_to='answer_keys/')
    created_at = models.DateTimeField(auto_now_add=True)

    def __str__(self):
        return f"{self.subject} - {dict(self.YEAR_CHOICES).get(self.year, 'Unknown')} -
{self.get_exam_type_display()}"

class ExamSubmission(models.Model):
    EXAM_TYPES = [
        ('CAT1', 'CAT 1'),
        ('CAT2', 'CAT 2'),
```

```
    ]

    YEARS = [
        (1, "First Year"),
        (2, "Second Year"),
        (3, "Third Year"),
        (4, "Fourth Year"),
    ]

    exam = models.ForeignKey(Exam, on_delete=models.CASCADE)  # Remove null=True,
blank=True
    student = models.ForeignKey(User, on_delete=models.CASCADE)
    subject = models.CharField(max_length=100)
    exam_type = models.CharField(max_length=10, choices=EXAM_TYPES)
    year = models.CharField(max_length=1, choices=YEARS)
    staff_name = models.CharField(max_length=100)
    answer_sheet = models.FileField(upload_to='answer_sheets/', null=True, blank=True)
    is_graded = models.BooleanField(default=False)

    def __str__(self):
        return f"{self.subject} - {self.exam_type} ({self.get_year_display()})"

class EvaluationResult(models.Model):
    submission = models.OneToOneField(
        ExamSubmission,
        on_delete=models.CASCADE,
        related_name="evaluation"
    )
    evaluated_by = models.ForeignKey(
        User,
        on_delete=models.SET_NULL,
        null=True,
        blank=True,
        related_name="evaluations"
    )
    formatted_report = models.TextField()  # Stores only the human-readable report
    total_score = models.FloatField(default=0.0)
    max_score = models.FloatField(default=0.0)
    created_at = models.DateTimeField(auto_now_add=True)

    def __str__(self):
        exam_subject = self.submission.exam.subject if self.submission.exam else "Unknown
Exam"
        return f"Evaluation for {self.submission.student.username} {exam_subject}"
```

Admin.py

```
from django.contrib import admin
from .models import EvaluationResult,Exam

admin.site.register(EvaluationResult)

admin.site.register(Exam)
```

Student-dashboard.html

```
{% extends 'base.html' %}

{% block content %}
<div class="container mt-5">
  <div class="card shadow-lg p-4">
    <h2 class="text-center text-primary fw-bold">Welcome, {{ request.user.username
}}!</h2>
    <hr>

    <div class="d-flex justify-content-between align-items-center mb-4">
      <h3 class="text-secondary fw-semibold">📄 Your Submitted Exams</h3>
      <a href="{% url 'student_exam_fill' %}" class="btn btn-success btn-lg shadow-sm">
        + Fill Exam Details
      </a>
    </div>

    {% if exams %}
    <div class="table-responsive">
      <table class="table table-hover table-bordered text-center align-middle">
        <thead class="table-dark">
          <tr>
            <th>📚 Subject</th>
            <th>📝 Exam Type</th>
            <th>🎓 Year</th>
            <th>👩‍🏫 Staff Name</th>
            <th>📊 Status</th>
            <th>🔍 Actions</th>
          </tr>
        </thead>
        <tbody>
          {% for exam in exams %}
          <tr>
            <td class="fw-bold">{{ exam.subject }}</td>
            <td>{{ exam.get_exam_type_display }}</td>
```

```
                    <td>{{ exam.get_year_display }}</td>
                    <td>{{ exam.staff_name }}</td>
                    <td>
                        {% if exam.is_graded %}
                            <span class="badge bg-success px-3 py-2">Graded</span>
                        {% else %}
                            <span class="badge bg-warning text-dark px-3 py-2">Pending</span>
                        {% endif %}
                    </td>
                    <td>
                        {% if exam.is_graded %}
                            <a href="{% url 'view_results' exam.id %}" class="btn btn-primary btn-sm
shadow-sm">
                                View Results
                            </a>
                        {% else %}
                            <button class="btn btn-secondary btn-sm shadow-sm" disabled>Awaiting
Grading</button>
                        {% endif %}
                    </td>
                </tr>
                {% endfor %}
            </tbody>
        </table>
    </div>
    {% else %}
    <div class="alert alert-info text-center">
        <p class="mb-0">🚀 No exams submitted yet. Start by filling out your first exam!</p>
    </div>
    {% endif %}

    <div class="text-center mt-4">
        <a href="{% url 'logout' %}" class="btn btn-danger btn-lg px-4 shadow-sm">🚪
Logout</a>
    </div>
  </div>
</div>

<style>
  body {
    background-color: #f8f9fa;
  }
  .card {
    border-radius: 12px;
    border: none;
    box-shadow: 0 4px 10px rgba(0, 0, 0, 0.1);
```

```
    }
    .table th {
        background-color: #212529;
        color: white;
    }
    .table td {
        vertical-align: middle;
    }
    .btn {
        border-radius: 8px;
    }
    .btn-success {
        background-color: #28a745;
    }
</style>
{% endblock %}
```

Teacher-dashboard.html

```
{% extends 'base.html' %}

{% block content %}
<div class="container-fluid">
    <div class="row">
        <!-- Sidebar -->
        <nav class="col-md-3 col-lg-2 d-md-block bg-dark sidebar vh-100 p-3">
            <h4 class="text-white text-center">📋 Teacher Panel</h4>
            <hr class="text-white">
            <ul class="nav flex-column">
                <li class="nav-item">
                    <a class="nav-link text-white" href="{% url 'teacher_dashboard' %}">
Dashboard</a>
                </li>
                <li class="nav-item">
                    <a class="nav-link text-white" href="{% url 'create_exam' %}">✏️ Create
Exam</a>
                </li>
                <li class="nav-item">
                    <a class="nav-link text-white" href="{% url 'logout' %}"> Logout</a>
                </li>
            </ul>
        </nav>

        <!-- Main Content -->
        <main class="col-md-9 ms-sm-auto col-lg-10 px-md-4 mt-4">
```

```
        <div class="d-flex justify-content-between align-items-center">
          <h2 class="text-primary">👩‍🏫 Welcome, {{ request.user.username }}</h2>
          <a href="{% url 'create_exam' %}" class="btn btn-success btn-lg shadow-sm">
            + Create Exam
          </a>
        </div>
        <hr>

        <h3 class="text-secondary">📄 Created Exams</h3>
        {% if exams %}
          <div class="table-responsive">
            <table class="table table-hover table-bordered text-center">
              <thead class="table-dark">
                <tr>
                  <th>Subject</th>
                  <th>Exam Type</th>
                  <th>Year</th>
                  <th>Actions</th>
                </tr>
              </thead>
              <tbody>
                {% for exam in exams %}
                  <tr>
                    <td class="fw-bold">{{ exam.subject }}</td>
                    <td>{{ exam.get_exam_type_display }}</td>
                    <td>{{ exam.get_year_display }}</td>
                    <td>
 <a href="{% url 'view_submissions' exam.id %}" class="btn btn-primary btn-sm">
                        📂 View Submissions
                      </a>
                    </td>
                  </tr>
                {% endfor %}
              </tbody>
            </table>
          </div>
        {% else %}
          <div class="alert alert-info text-center">
            <p class="mb-0">No exams created yet.</p>
          </div>
        {% endif %}
      </main>
    </div>
  </div>

  <style>
```

```
    /* Sidebar Styling */
    .sidebar {
        height: 100vh;
        position: fixed;
        left: 0;
        top: 0;
        width: 250px;
    }

    /* Adjust main content */
    main {
        margin-left: 260px;
    }

    /* Button Styling */
    .btn-sm {
        font-size: 0.9rem;
    }

    /* Responsive Design */
    @media (max-width: 768px) {
        .sidebar {
            position: relative;
            height: auto;
            width: 100%;
        }
        main {
            margin-left: 0;
        }
    }
</style>
{% endblock %}
```

Create_Exam.html

```
{% extends 'base.html' %}

{% block content %}
<div class="container mt-5">
    <div class="card shadow-lg p-4 rounded-4">
        <h2 class="text-center text-primary fw-bold">📄 Create Exam</h2>
        <hr class="mb-4">

        {% if messages %}
            {% for message in messages %}
                <div class="alert alert-{{ message.tags }} text-center">{{ message }}</div>
```

```
    {% endfor %}
  {% endif %}

  <form method="POST" enctype="multipart/form-data">
    {% csrf_token %}

    <div class="mb-3">
      <label class="form-label fw-bold">📚 Subject Name</label>
      <input type="text" name="subject" class="form-control rounded-3 shadow-sm"
placeholder="Enter subject name" required>
    </div>

    <div class="mb-3">
      <label class="form-label fw-bold">📌 Exam Type</label>
      <select name="exam_type" class="form-select rounded-3 shadow-sm" required>
        <option value="CAT 1">📝 CAT 1</option>
        <option value="CAT 2">📝 CAT 2</option>
        <option value="Term 1">🧮 Term 1</option>
      </select>
    </div>

    <div class="mb-3">
      <label class="form-label fw-bold">🎓 Year</label>
      <select name="year" class="form-select rounded-3 shadow-sm" required>
        <option value="1">📘 First Year</option>
        <option value="2">📗 Second Year</option>
        <option value="3">📙 Third Year</option>
        <option value="4">📕 Fourth Year</option>
      </select>
    </div>

    <div class="mb-3">
      <label class="form-label fw-bold">👩‍🏫 Staff Name</label>
      <input type="text" name="staff_name" class="form-control rounded-3 shadow-sm"
placeholder="Enter staff name" required>
    </div>

    <div class="mb-3">
      <label class="form-label fw-bold">📄 Upload Question Paper (PDF)</label>
      <input type="file" name="question_paper" class="form-control rounded-3 shadow-
sm" accept=".pdf" required>
    </div>

    <div class="mb-3">
```

```
            <label class="form-label fw-bold">📝 Upload Answer Key (PDF)</label>
            <input type="file" name="answer_key" class="form-control rounded-3 shadow-sm"
accept=".pdf" required>
        </div>

        <button type="submit" class="btn btn-success w-100 fw-bold py-2 shadow-lg">
            ☑ Submit Exam
        </button>
    </form>

    <div class="text-center mt-4">
        <a href="{% url 'teacher_dashboard' %}" class="btn btn-secondary fw-bold shadow-sm
px-4 py-2">
            🔙 Back to Dashboard
        </a>
    </div>
  </div>
</div>

<style>
  body {
    background-color: #f4f6f9; /* Light Gray Background */
  }

  .card {
    max-width: 600px;
    margin: auto;
    background: #ffffff;
    border-radius: 15px;
    box-shadow: 0px 4px 10px rgba(0, 0, 0, 0.1);
  }

  .btn-success {
    background-color: #28a745;
    border: none;
  }

  .btn-success:hover {
    background-color: #218838;
  }

  .btn-secondary {
    background-color: #6c757d;
    border: none;
  }
```

```
            .btn-secondary:hover {
                background-color: #5a6268;
            }

            .form-control {
                border-radius: 10px;
            }
        </style>
        {% endblock %}
```

Evaluate_Submission.html

```
{% extends 'base.html' %}

{% block content %}
<div class="container mt-5">
    <h2 class="text-center text-primary">📄 Exam Report</h2>
    <hr>

    <!-- Student & Exam Info Section -->
    <div class="card shadow-sm mb-4">
        <div class="card-body">
            <h5 class="card-title text-center text-dark">📌 Exam Details</h5>
            <hr>
            <div class="row">
                <div class="col-md-6">
                    <p><strong>📚 Exam Name:</strong> {{ submission.exam.subject }}</p>
                    <p><strong>📅 Date:</strong> {{ submission.exam.created_at|date:"d M Y" }}</p>
                    <p><strong>🎯 Exam Type:</strong> {{ submission.exam.get_exam_type_display }}</p>
                </div>
                <div class="col-md-6">
                    <p><strong>👤 Student Name:</strong> {{ submission.student.username }}</p>
                    <p><strong>🎓 Roll Number:</strong> {{ submission.student.id }}</p>
                    <p><strong>🏫 Year:</strong> {{ submission.get_year_display }}</p>
                </div>
            </div>
        </div>
    </div>

    <!-- Exam Report Table -->
    <div class="table-responsive">
        <table class="table table-striped table-bordered">
            <thead class="table-dark">
                <tr>
                    <th>Q.No</th>
                    <th>Question</th>
```

```
                <th>Student Answer</th>
                <th>Correct Answer</th>
                <th>Marks Awarded</th>
                <th>Max Marks</th>
                <th>Evaluation</th>
            </tr>
        </thead>
        <tbody>
            {% for result in formatted_report.report %}
            <tr>
                <td>{{ result.question_number }}</td>
                <td>{{ result.question }}</td>
                <td class="text-danger">{{ result.student_answer }}</td>
                <td class="text-success">{{ result.correct_answer }}</td>
                <td class="text-center fw-bold">{{ result.marks_awarded }}</td>
                <td class="text-center fw-bold">{{ result.max_marks }}</td>
                <td class="text-warning">{{ result.reason }}</td>
            </tr>
            {% endfor %}
        </tbody>
    </table>
</div>

<!-- Total Score Section -->
<div class="text-center mt-4 p-3 bg-light rounded">
    <h4>Total Score: <span class="text-success">{{ total_score }}</span> / <span class="text-
primary">{{ max_score }}</span></h4>
</div>
</div>
{% endblock %}
```

View_Submissions.html

```
{% extends 'base.html' %}

{% block content %}
<div class="container mt-5">
<h2 class="text-center text-primary">📝 Submissions for {{ exam.subject }} ({{
exam.get_exam_type_display }})</h2>
<hr>

{% if messages %}
    {% for message in messages %}
        <div class="alert alert-{{ message.tags }} text-center">{{ message }}</div>
    {% endfor %}
{% endif %}
```

```
    {% if submissions %}
      <form method="POST" enctype="multipart/form-data">
        {% csrf_token %}
        <table class="table table-bordered text-center">
          <thead class="table-dark">
            <tr>
              <th>Student Name</th>
              <th>Year</th>
              <th>Answer Sheet</th>
              <th> Upload Answer Sheet</th>
              <th> Evaluate</th>
            </tr>
          </thead>
          <tbody>
            {% for submission in submissions %}
              <tr>
                <td>{{ submission.student.username }}</td>
                <td>{{ submission.get_year_display }}</td>
                <td>
                  {% if submission.answer_sheet %}
                    <a href="{{ submission.answer_sheet.url }}" class="btn btn-info btn-sm"
target="_blank"> View</a>
                  {% else %}
                    <span class="badge bg-danger">Not Uploaded</span>
                  {% endif %}
                </td>
                <td>
                  {% if submission.answer_sheet %}
                    <span class="badge bg-success"> Uploaded</span>
                  {% else %}
                    <input type="file" name="answer_sheet_{{ submission.id }}" class="form-
control form-control-sm">
                  {% endif %}
                </td>
                <td>
                  {% if submission.answer_sheet %}
                    <a href="{% url 'evaluate_submission' submission.id %}" id="evaluate-btn-{{
submission.id }}"
                       class="btn btn-warning btn-sm evaluate-btn">
                       Evaluate
                    </a>
                    <div id="loading-spinner-{{ submission.id }}" class="text-center mt-2 d-none">
                      <div class="spinner-border text-primary" role="status">
                        <span class="visually-hidden">Loading...</span>
                      </div>
```

```
                        <p class="mt-2">Processing Evaluation...</p>
                    </div>
                {% else %}
                    <button class="btn btn-secondary btn-sm" disabled>⚠ No Answer
Sheet</button>
                {% endif %}
            </td>
        </tr>
    {% endfor %}
    </tbody>
</table>
<div class="text-center">
    <button type="submit" class="btn btn-success px-4 py-2"> Upload Selected Files</button>
</div>
</form>
{% else %}
<div class="alert alert-info text-center">
    No submissions yet.
</div>
{% endif %}

<div class="text-center mt-4">
    <a href="{% url 'teacher_dashboard' %}" class="btn btn-secondary"> Back to Dashboard</a>
</div>
</div>

<script>
document.addEventListener("DOMContentLoaded", function() {
    let evaluateButtons = document.querySelectorAll(".evaluate-btn");

    evaluateButtons.forEach(function(button) {
        button.addEventListener("click", function(event) {
            let submissionId = button.id.split("-").pop();
            let loader = document.getElementById("loading-spinner-" + submissionId);

            // Show the loader and hide the button
            button.classList.add("d-none");
            loader.classList.remove("d-none");

            // Allow normal navigation to Django route (page will reload)
        });
    });
});
</script>

{% endblock %}
```

9.2 APPENDIX-B: DEMO SCREENSHOTS

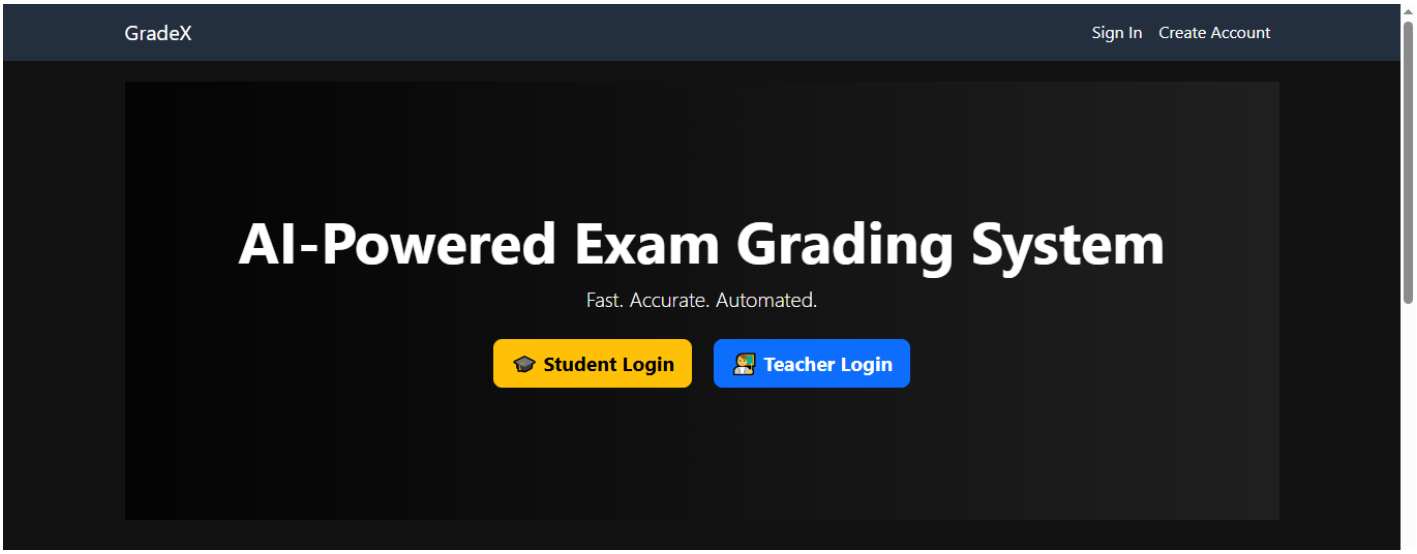


Fig: 9.1 GradeX Website

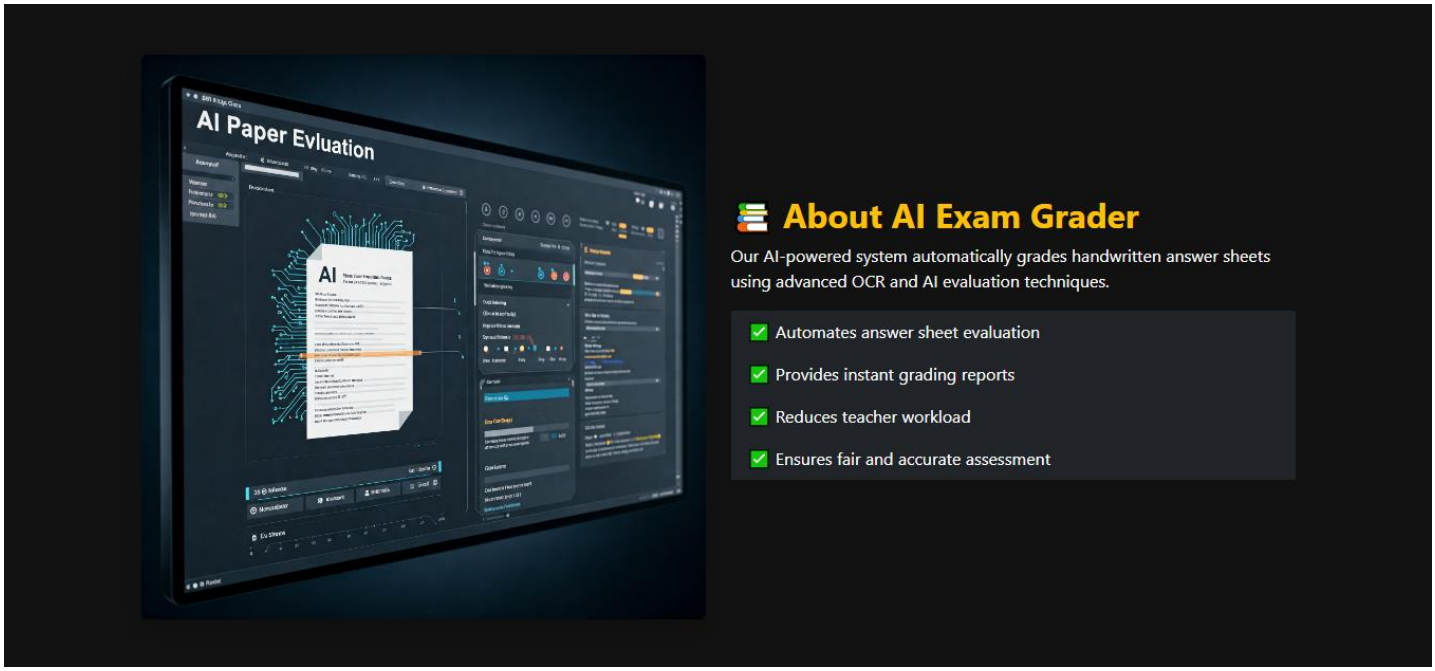


Fig: 9.2 GradeX Information

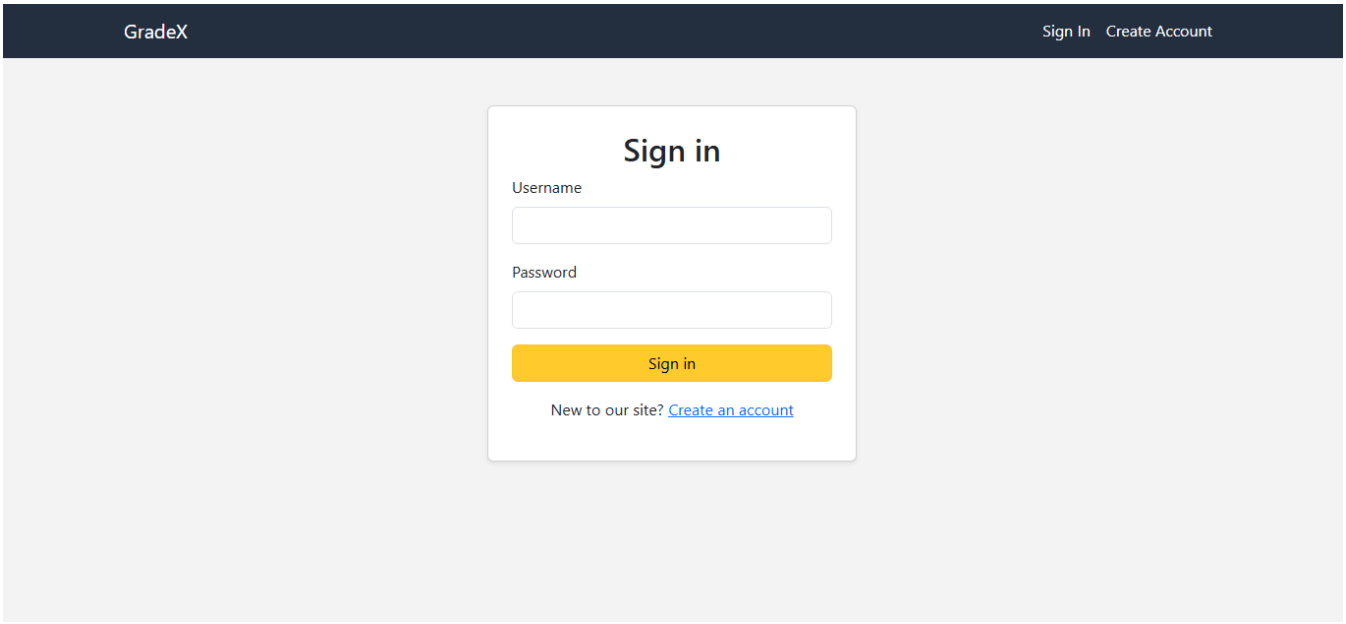


Fig: 9.3 Gradex Student Signin

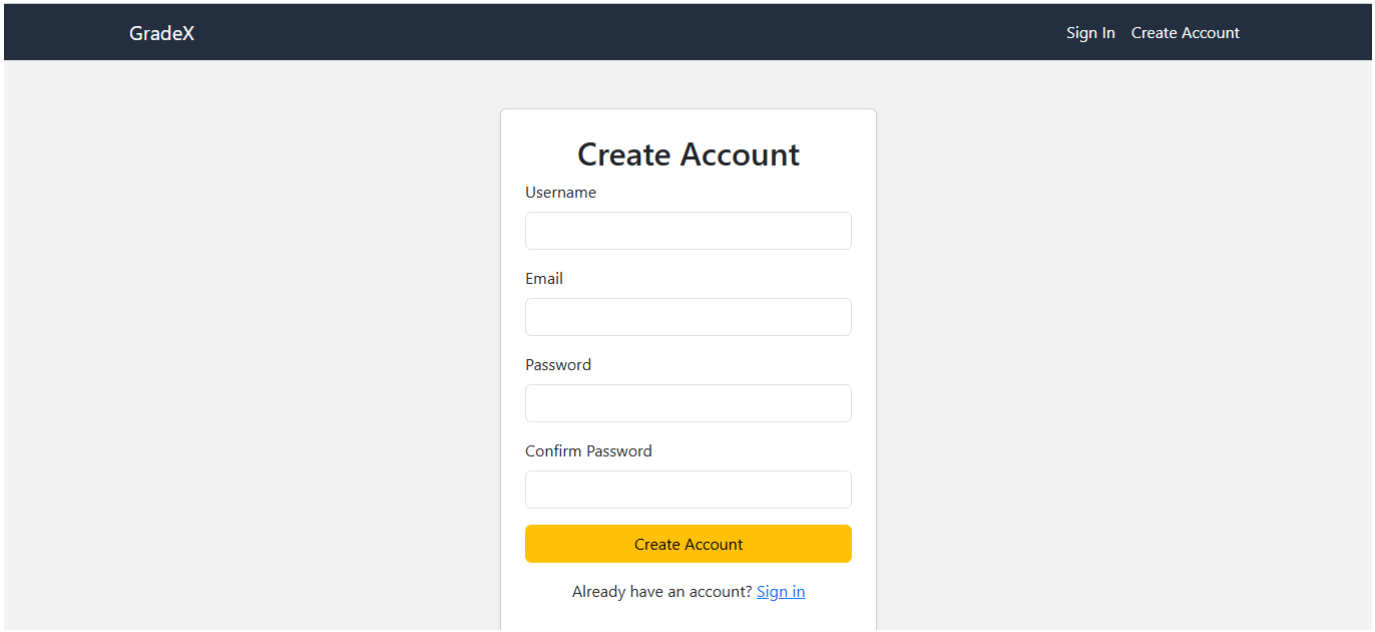


Fig: 9.4 Gradex Student Sign up

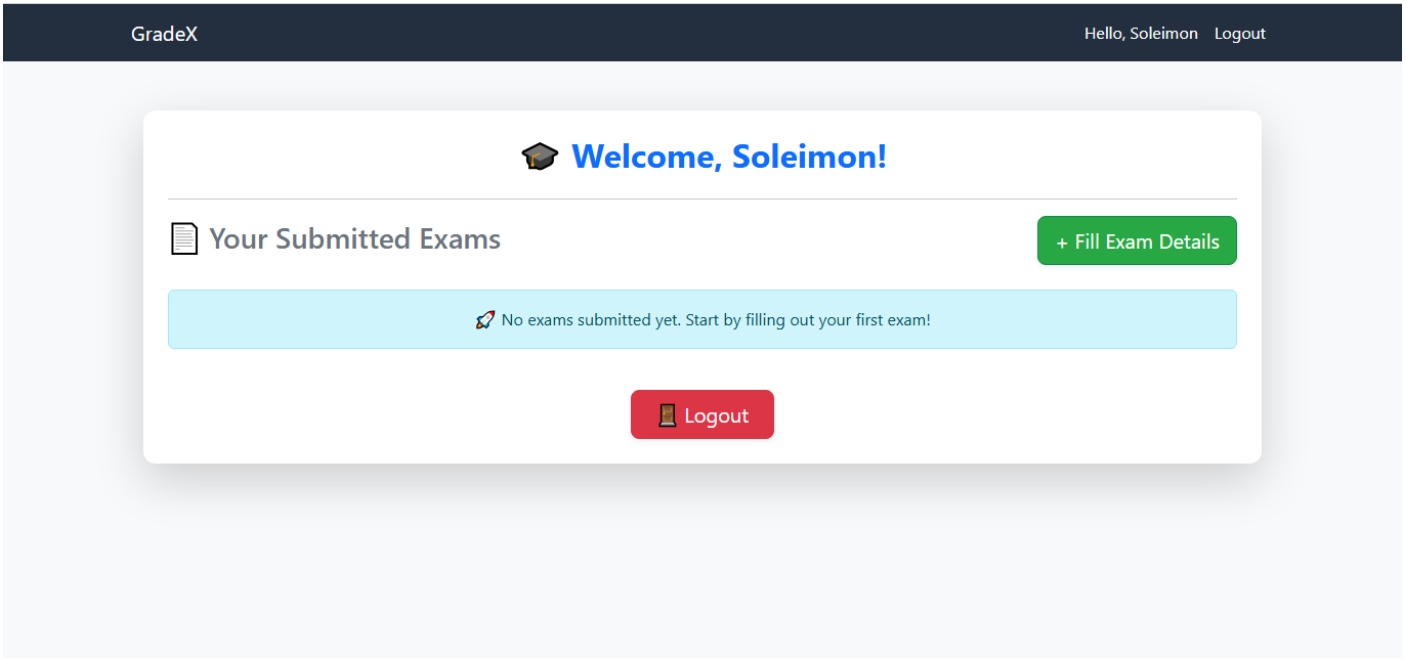


Fig: 9.5 Gradex Student Dashboard

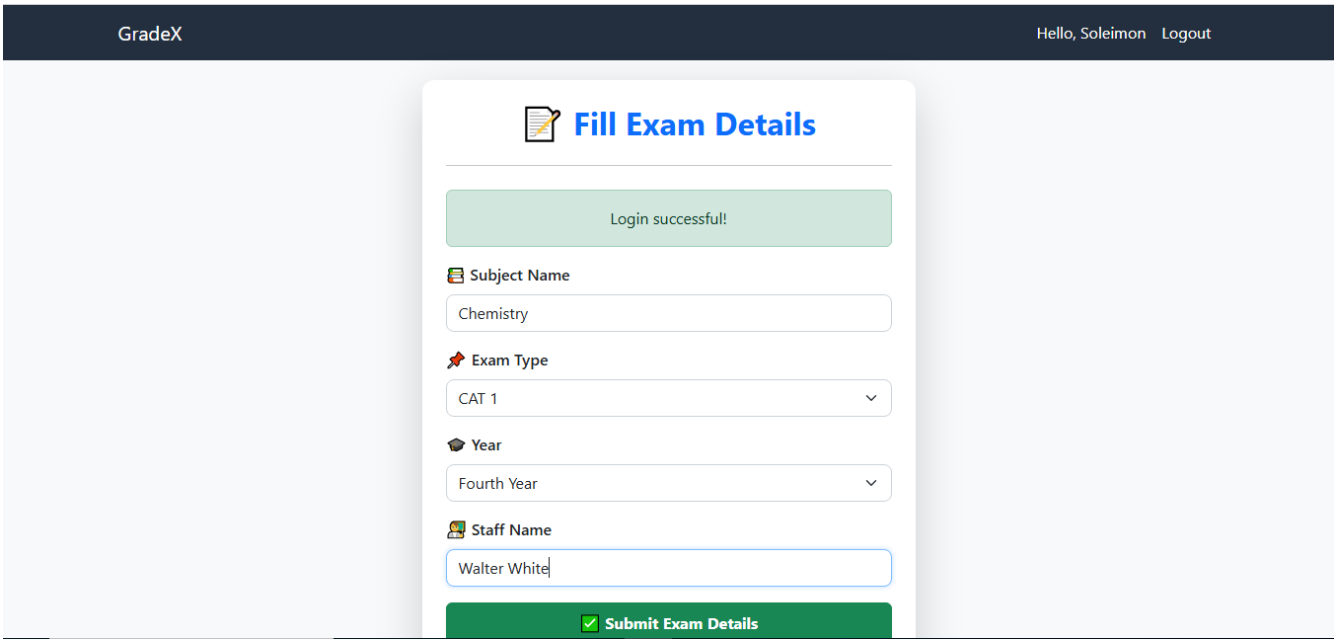


Fig: 9.6 Gradex Student Exam Fill

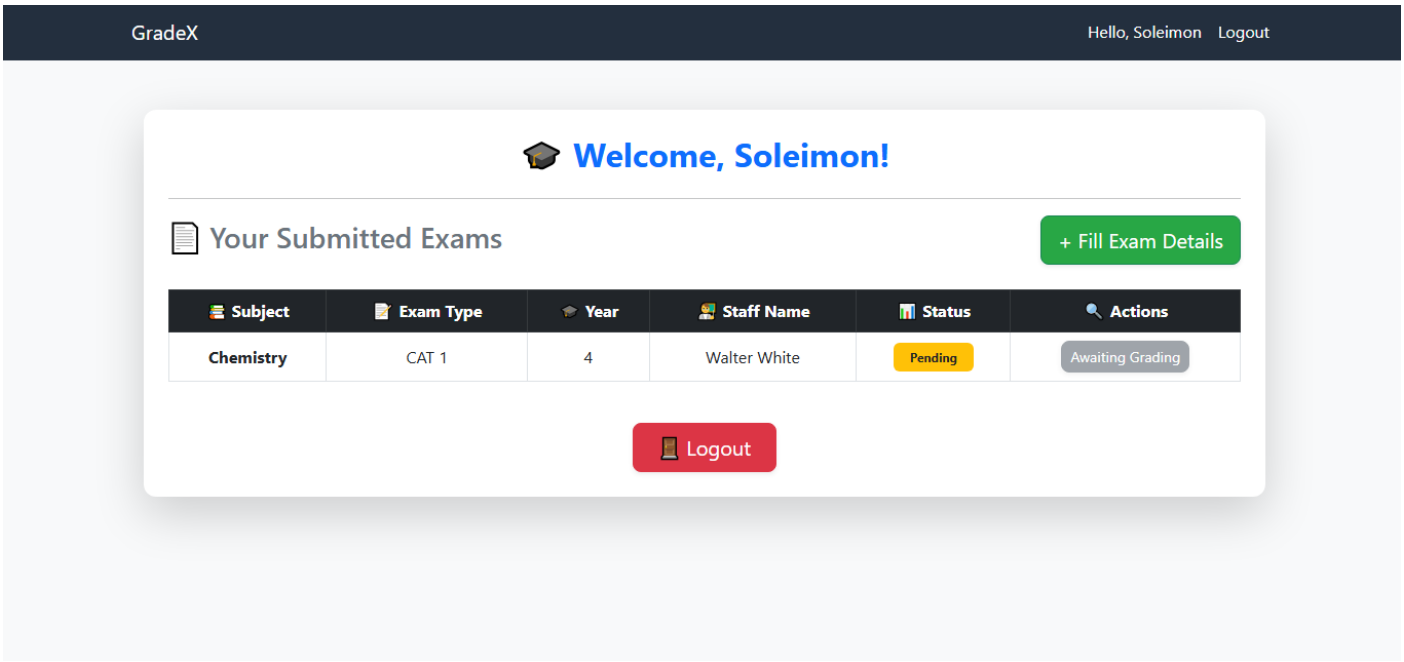


Fig: 9.7 Gradex Student Awaiting Exam Status

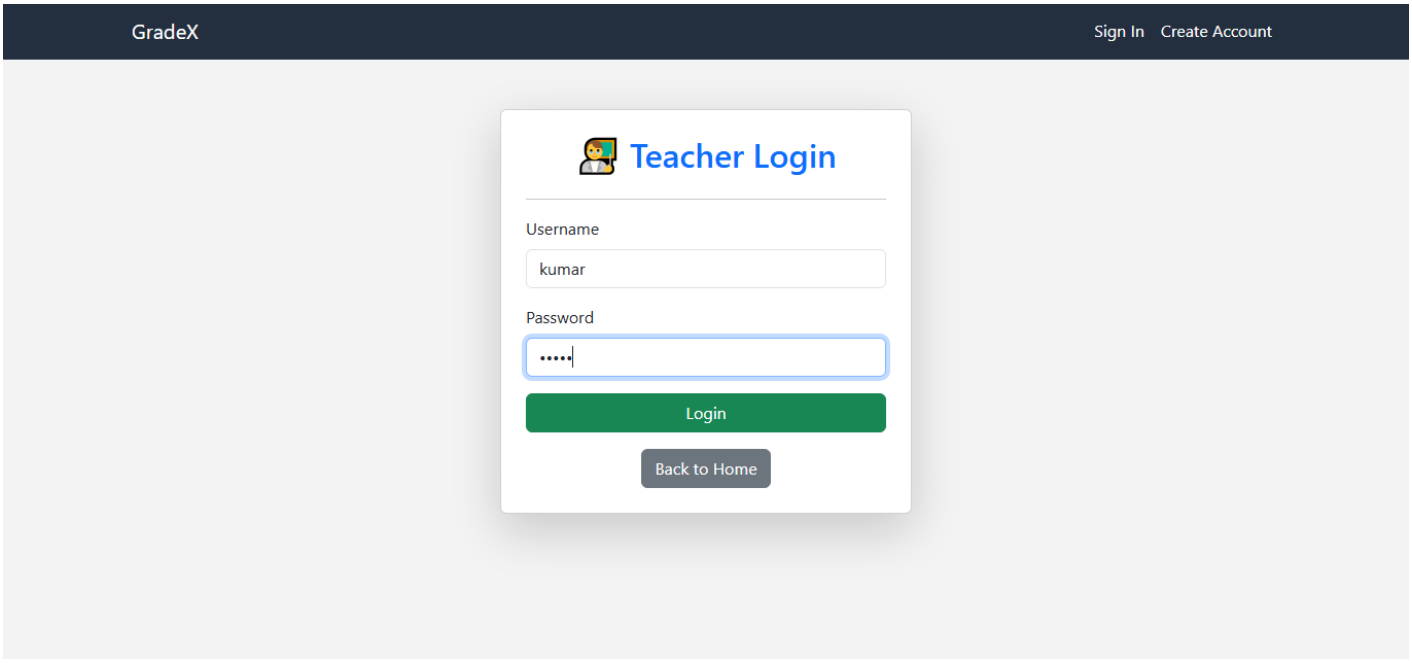


Fig: 9.8 Gradex Teacher Login

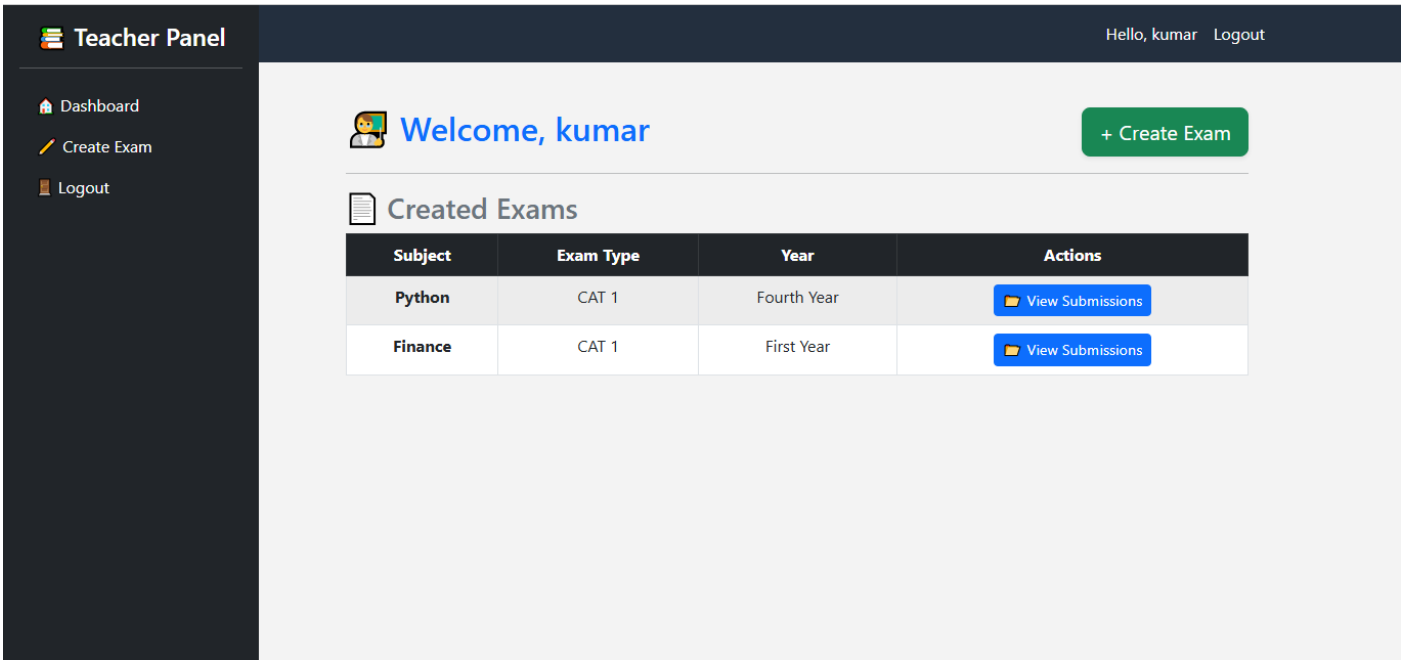


Fig: 9.9 Gradex Teacher Dashboard

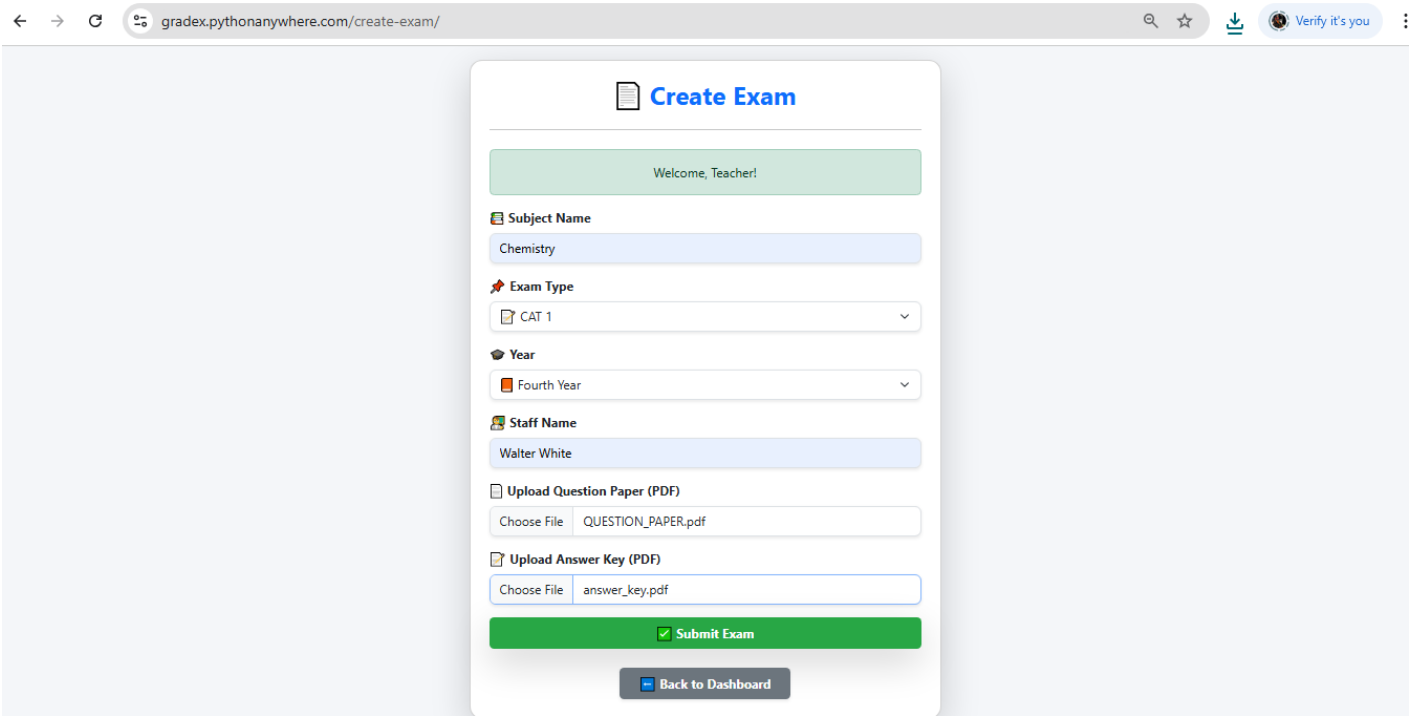


Fig: 9.10 Gradex Teacher Exam Creation

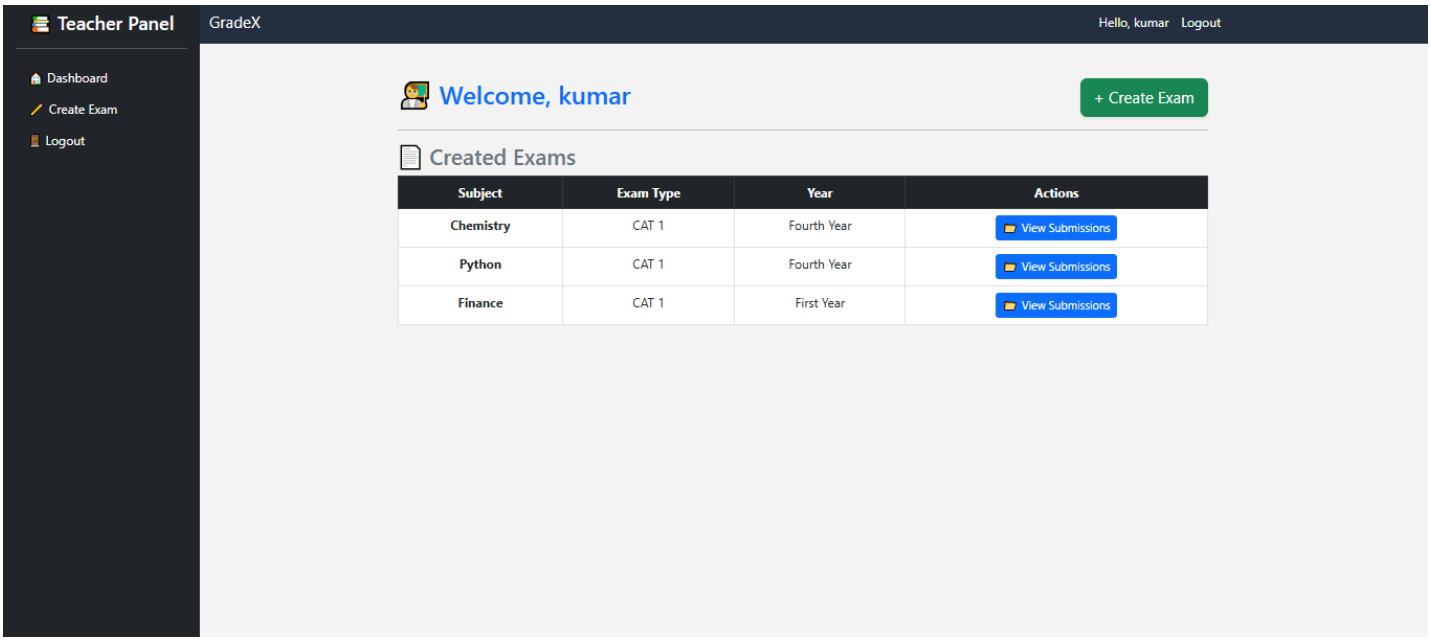


Fig: 9.11 Gradex Teacher Dashboard-Created Exams

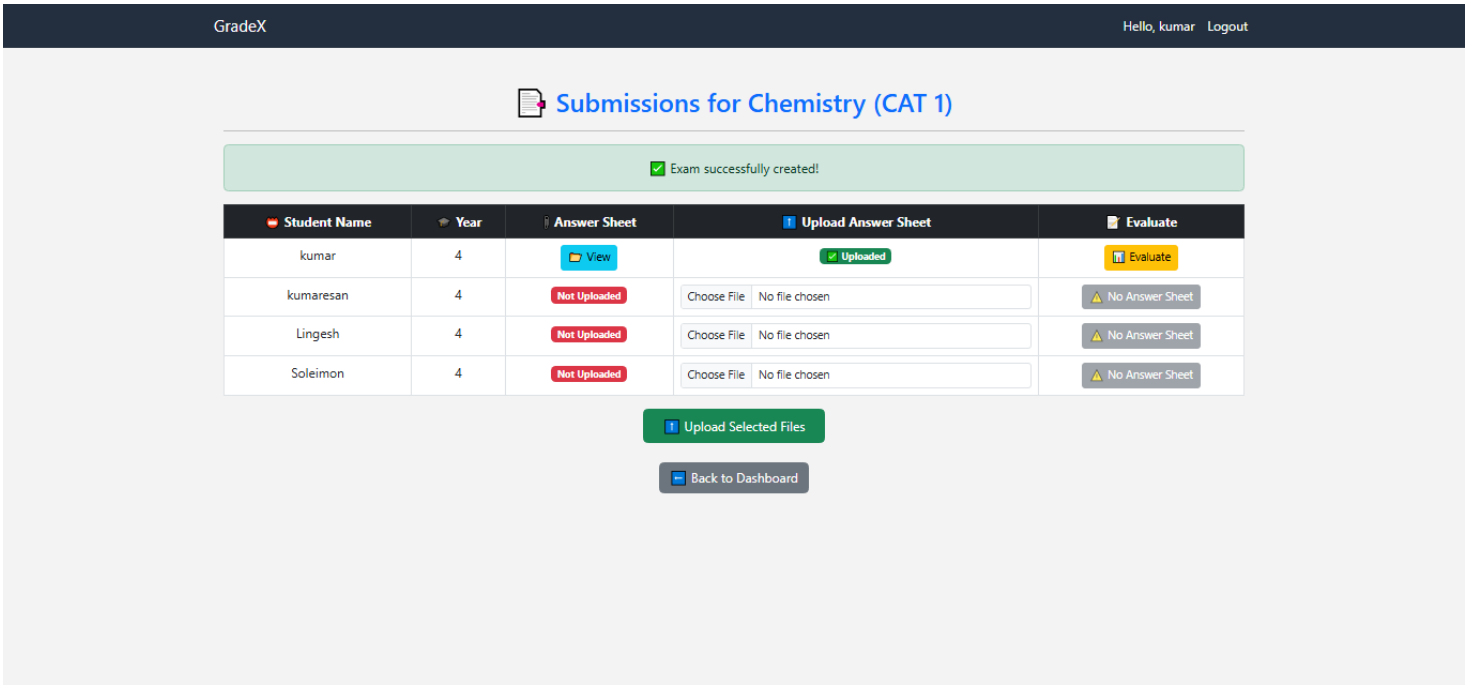


Fig: 9.12 Gradex Teacher Dashboard-Exam Submissin List

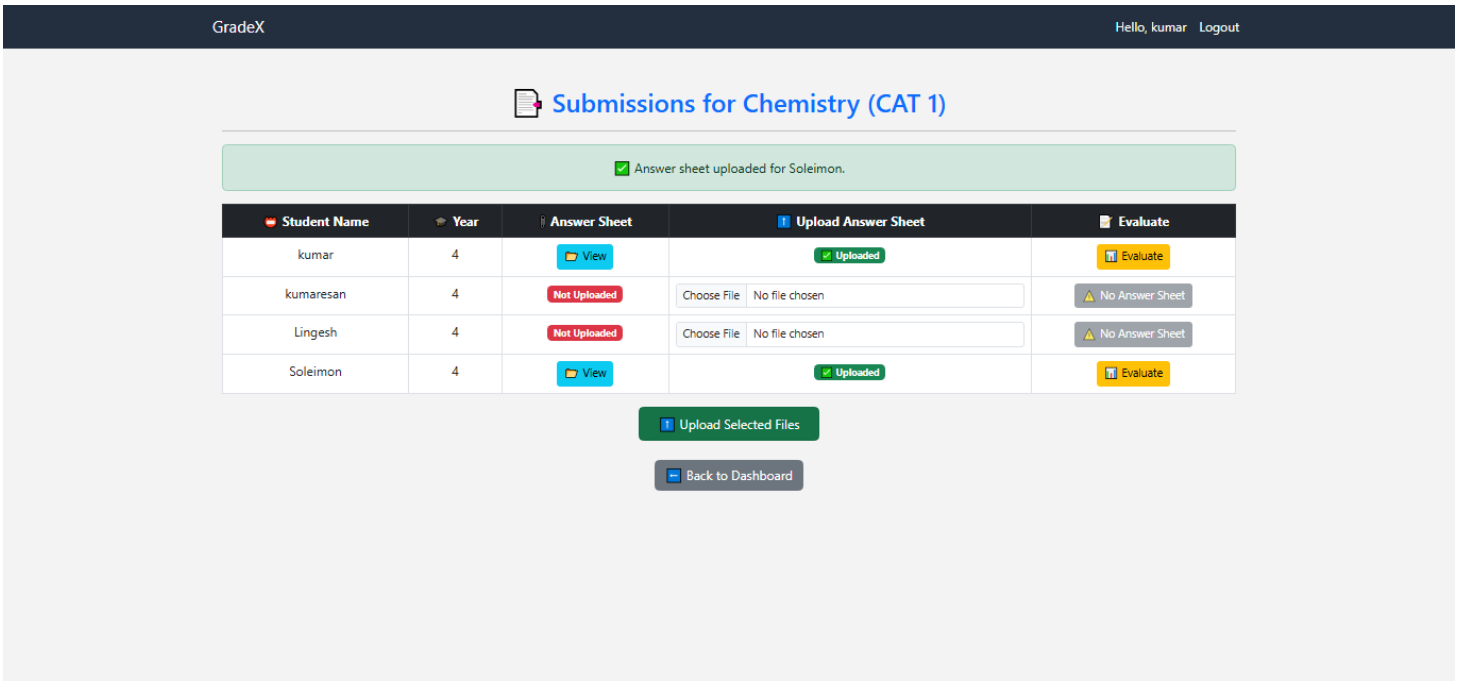


Fig: 9.13 Gradex Teacher Dashboard-Answer Sheet Upload

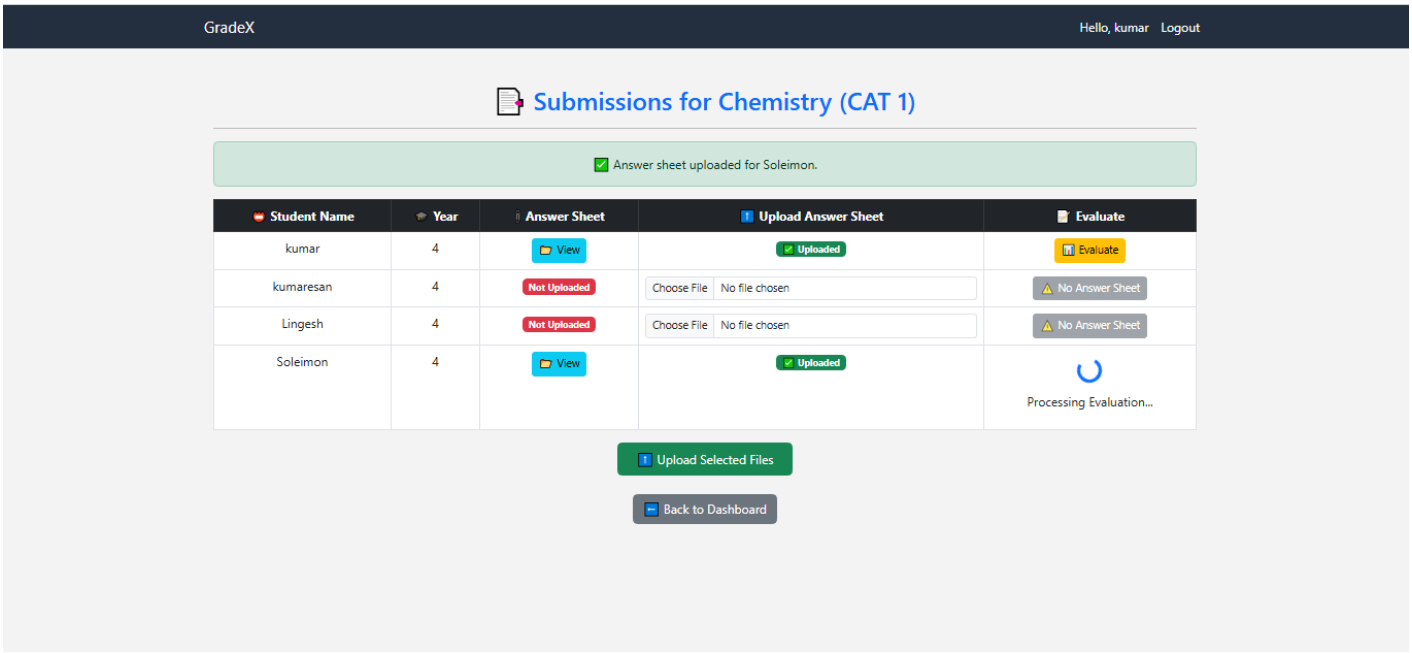
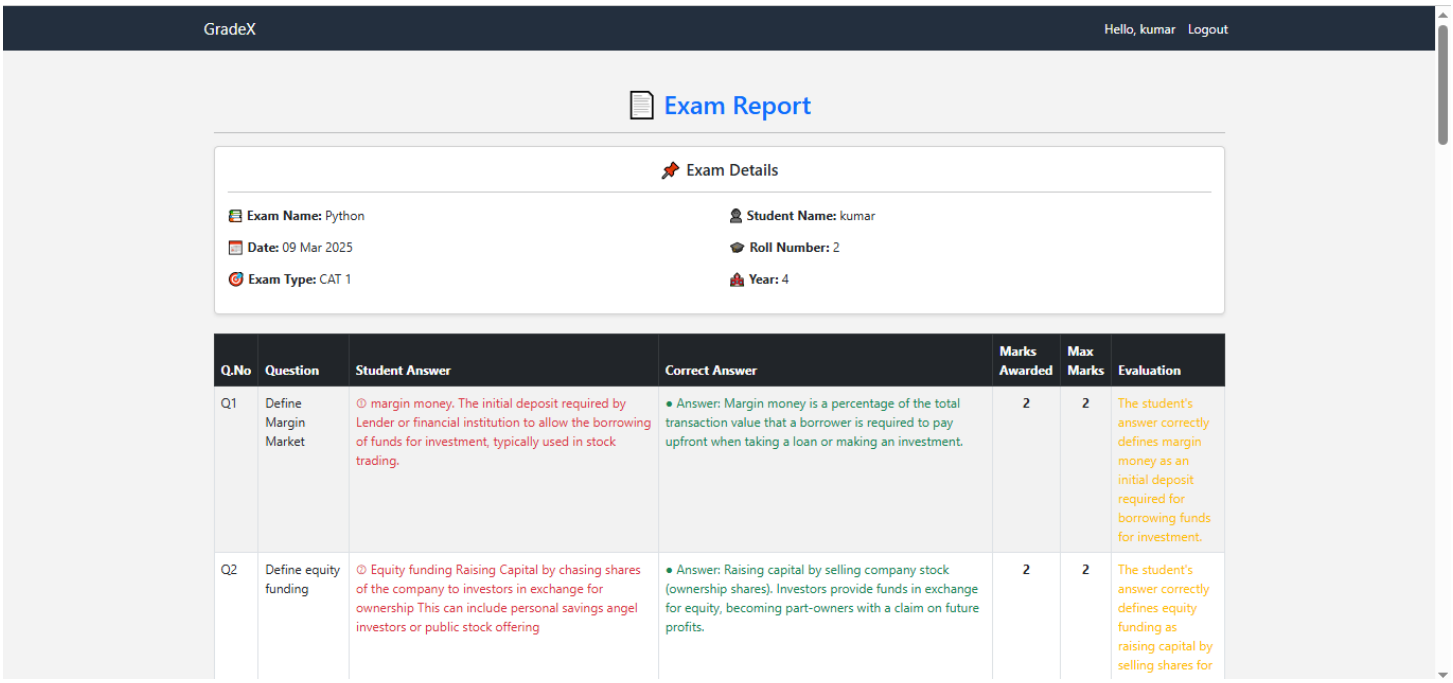
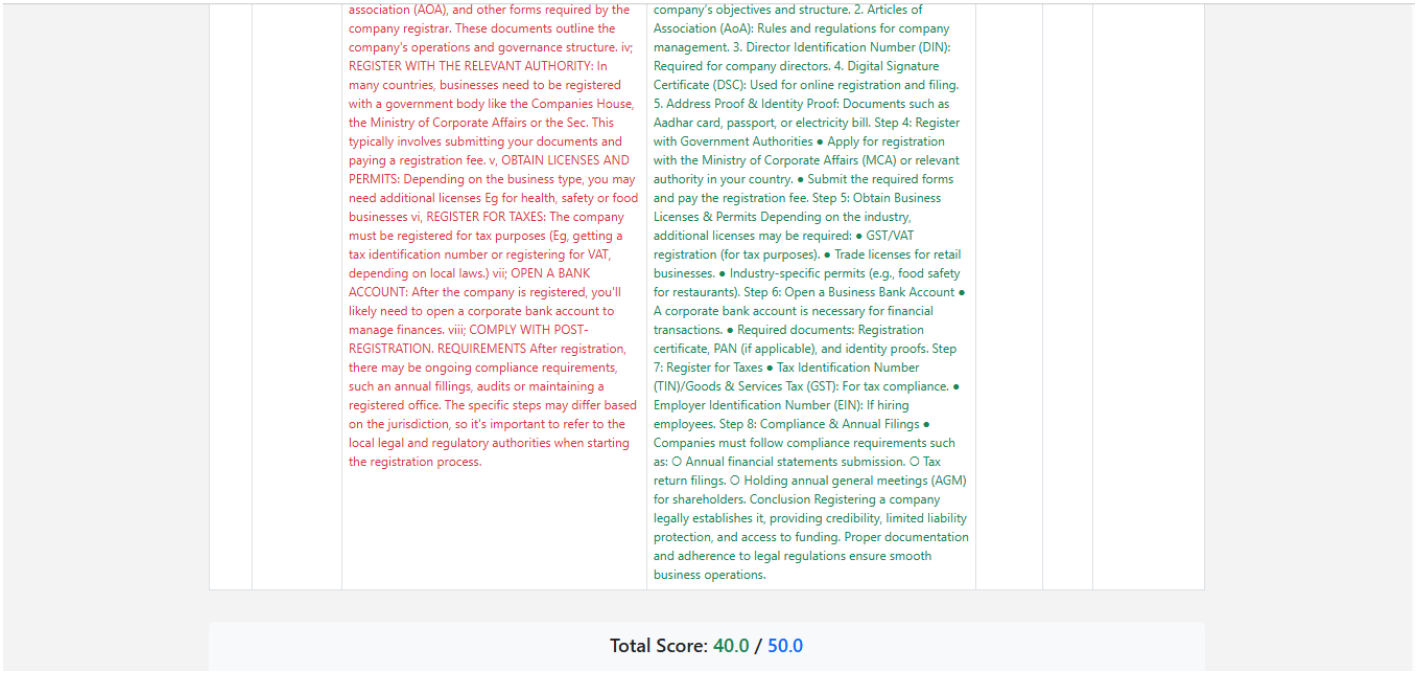


Fig: 9.14 Gradex Teacher Dashboard-Answer Sheet Evaluating



Q.No	Question	Student Answer	Correct Answer	Marks Awarded	Max Marks	Evaluation
Q1	Define Margin Market	① margin money. The initial deposit required by Lender or financial institution to allow the borrowing of funds for investment, typically used in stock trading.	• Answer: Margin money is a percentage of the total transaction value that a borrower is required to pay upfront when taking a loan or making an investment.	2	2	The student's answer correctly defines margin money as an initial deposit required for borrowing funds for investment.
Q2	Define equity funding	② Equity funding Raising Capital by chasing shares of the company to investors in exchange for ownership This can include personal savings angel investors or public stock offering	• Answer: Raising capital by selling company stock (ownership shares). Investors provide funds in exchange for equity, becoming part-owners with a claim on future profits.	2	2	The student's answer correctly defines equity funding as raising capital by selling shares for

Fig: 9.15 Gradex Teacher Dashboard-Results-1



		association (AOA), and other forms required by the company registrar. These documents outline the company's operations and governance structure. iv; REGISTER WITH THE RELEVANT AUTHORITY: In many countries, businesses need to be registered with a government body like the Companies House, the Ministry of Corporate Affairs or the Sec. This typically involves submitting your documents and paying a registration fee. v, OBTAIN LICENSES AND PERMITS: Depending on the business type, you may need additional licenses Eg for health, safety or food businesses vi, REGISTER FOR TAXES: The company must be registered for tax purposes (Eg, getting a tax identification number or registering for VAT, depending on local laws.) vii; OPEN A BANK ACCOUNT: After the company is registered, you'll likely need to open a corporate bank account to manage finances. viii; COMPLY WITH POST-REGISTRATION. REQUIREMENTS After registration, there may be ongoing compliance requirements, such an annual fillings, audits or maintaining a registered office. The specific steps may differ based on the jurisdiction, so it's important to refer to the local legal and regulatory authorities when starting the registration process.	company's objectives and structure. 2. Articles of Association (AoA): Rules and regulations for company management. 3. Director Identification Number (DIN): Required for company directors. 4. Digital Signature Certificate (DSC): Used for online registration and filing. 5. Address Proof & Identity Proof: Documents such as Aadhar card, passport, or electricity bill. Step 4: Register with Government Authorities • Apply for registration with the Ministry of Corporate Affairs (MCA) or relevant authority in your country. • Submit the required forms and pay the registration fee. Step 5: Obtain Business Licenses & Permits Depending on the industry, additional licenses may be required: • GST/VAT registration (for tax purposes). • Trade licenses for retail businesses. • Industry-specific permits (e.g., food safety for restaurants). Step 6: Open a Business Bank Account • A corporate bank account is necessary for financial transactions. • Required documents: Registration certificate, PAN (if applicable), and identity proofs. Step 7: Register for Taxes • Tax Identification Number (TIN)/Goods & Services Tax (GST): For tax compliance. • Employer Identification Number (EIN): If hiring employees. Step 8: Compliance & Annual Filings • Companies must follow compliance requirements such as: O Annual financial statements submission. O Tax return filings. O Holding annual general meetings (AGM) for shareholders. Conclusion Registering a company legally establishes it, providing credibility, limited liability protection, and access to funding. Proper documentation and adherence to legal regulations ensure smooth business operations.			

Total Score: 40.0 / 50.0

Fig: 9.16 Gradex Teacher Dashboard-Results-2

Chapter 10

Future Enhancement

While the Gradex system has successfully streamlined the process of evaluating handwritten student answer sheets using OCR and AI, the current workflow still requires manual scanning or photographing of the answer sheets before processing. A major area for improvement lies in automating this input step to make the system more seamless and scalable.

The primary future enhancement will focus on digitizing the answer sheet collection process. Instead of manually scanning or converting student-written sheets into PDFs or image formats, the system can be integrated with school digital infrastructure to automatically ingest answer sheets directly from:

- **Smart exam papers** written on digital pads or tablets with stylus input
- **Mobile app-based capture systems** where teachers simply click pictures, and the app auto-converts and uploads them to the backend
- **Scanner integration APIs** that trigger evaluation as soon as papers are scanned

This would eliminate delays, reduce human effort, and improve the overall efficiency of the system from input to evaluation.

In addition to this, several other enhancements are planned for the Gradex platform:

- **Multilingual Answer Sheet Support**
  Expanding OCR and NLP capabilities to evaluate responses written in regional languages.
- **Real-time Evaluation via Digital Input Devices**
  Supporting direct writing on tablets to allow instant feedback and auto-evaluation.
- **Learning Feedback Loop for Scoring Adjustment**
  Using machine learning models to learn from teacher corrections and adapt future scoring.
- **Advanced Student Performance Analytics**
  Generating detailed reports with topic-wise analytics, progress tracking, and feedback suggestions.
- **Plagiarism Detection**
  Adding modules to detect similar or copied content between students' answers.
- **LMS and Mobile Integration**
  Integrating with Learning Management Systems (LMS) and offering mobile apps for easy access by both students and teachers.

By focusing on automating the initial input step, Gradex will not only become more efficient but also truly scalable for large-scale educational deployments.

REFERENCES

[1] Y. LeCun, Y. Bengio, and G. Hinton, "Deep learning," *Nature*, vol. 521, no. 7553, pp. 436–444, 2015.

[2] A. Graves, S. Fernández, M. Liwicki, H. Bunke, and J. Schmidhuber, "Unconstrained online handwriting recognition with recurrent neural networks," in Proc. 20th Int. Conf. Neural Inf. Process. Syst. (NIPS), 2008, pp. 577–584.

[3] S. Hochreiter and J. Schmidhuber, "Long short-term memory," Neural Computation, vol. 9, no. 8, pp. 1735–1780, 1997.

[4] M. D. Zeiler and R. Fergus, "Visualizing and understanding convolutional networks," in Proc. European Conf. Computer Vision (ECCV), 2014, pp. 818–833.

[5] R. Smith, "An overview of the Tesseract OCR engine," in Proc. Int. Conf. Document Anal. Recognit. (ICDAR), 2007, pp. 629–633.

[6] OpenAI, "GPT-4 technical report," arXiv preprint arXiv:2303.08774, 2023.

[7] R. S. Sutton and A. G. Barto, Reinforcement Learning: An Introduction, 2nd ed. Cambridge, MA, USA: MIT Press, 2018.

[8] N. Dalal and B. Triggs, "Histograms of oriented gradients for human detection," in Proc. IEEE Comput. Soc. Conf. Comput. Vis. Pattern Recognit. (CVPR), 2005, vol. 1, pp. 886–893.

[9] D. Bahdanau, K. Cho, and Y. Bengio, "Neural machine translation by jointly learning to align and translate," in Proc. Int. Conf. Learn. Represent. (ICLR), 2015.

[10] K. He, X. Zhang, S. Ren, and J. Sun, "Deep residual learning for image recognition," in Proc. IEEE Conf. Comput. Vis. Pattern Recognit. (CVPR), 2016, pp. 770–778.

CONFERENCE CERTIFICATES

CERTIFICATE OF APPRECIATION

This is to certify that Mr.K.P.Kumaresan, Kings College of Engineering, has presented a paper entitled on AI-Powered Answer Sheet Evaluation Using OCR and Large Language Models for Automated Grading in International Conference on "Sustainable Innovations in Management, Technology & Advanced Computing-SIMTAC'25" in association with SEGi University, KL, Malaysia organized by School of Management Studies & School of Computer Applications, on 4th April 2025 at Karpagam College of Engineering, Coimbatore.

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Head - Learning & Quality assurance
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Mohamed Asick A
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Instructors **Bert Gollnick**

Kumaresan

Date **12 Feb 2025**
Length **19 total hours**