Here is a clear step-by-step guide to creating a Django project from scratch

1. **Install Python**
   - **First, make sure Python is installed: python --version**
   - **If not installed, download it from the official website: Python Software Foundation**
2. **Create a Virtual Environment (Recommended)**

A virtual environment keeps project dependencies isolated.

Create it:

- **python -m venv venv**
- **Activate it:**
- **On Windows:**
- **venv\Scripts\activate**

3. **Install Django**
   - **pip install django**
4. **Create a New Django Project**
   - **django-admin startproject myproject**
   - **Replace myproject with your desired project name.**
   - **Move into the project folder:**
   - **cd myproject**
5. **Run the Development Server**
   - **python manage.py runserver**
   - **Open your browser and go to:**
   - **http://127.0.0.1:8000/**
   - **You should see the Django welcome page**
6. **Create a Django App**
   - **Inside your project directory:**
   - **python manage.py startapp myapp**
   - **Example:**
     python manage.py startapp users
7. **Register the App**
   - **Open:**
   - **myproject/settings.py**
   - **Add your app inside INSTALLED_APPS:**
   - **INSTALLED_APPS = [**
   - **...**
   - **'myapp',**
   - **]**
8. **Run Migrations**

- **python manage.py makemigrations**
- **python manage.py migrate**

9. **Create Superuser (Admin)**
   - **python manage.py createsuperuser**
   - **Then visit:**
   - **http://127.0.0.1:8000/admin/**
10. **Python in web development (frontend/backend)**
    - **Frontend = HTML templates + CSS. Example: crud_app/templates/crud_app/student_form.html.**
    - **Backend = Python views + models. Views handle requests and return templates in crud_app/views.py.**
    - **Frontend <>Backend connection**
      - **The template form submits to a URL route, which calls a view that saves data.**
      - **Example: student_create receives POST data, validates with StudentForm, and saves. See crud_app/views.py.**
    - **URL mapping(Connect frontend to backend)**

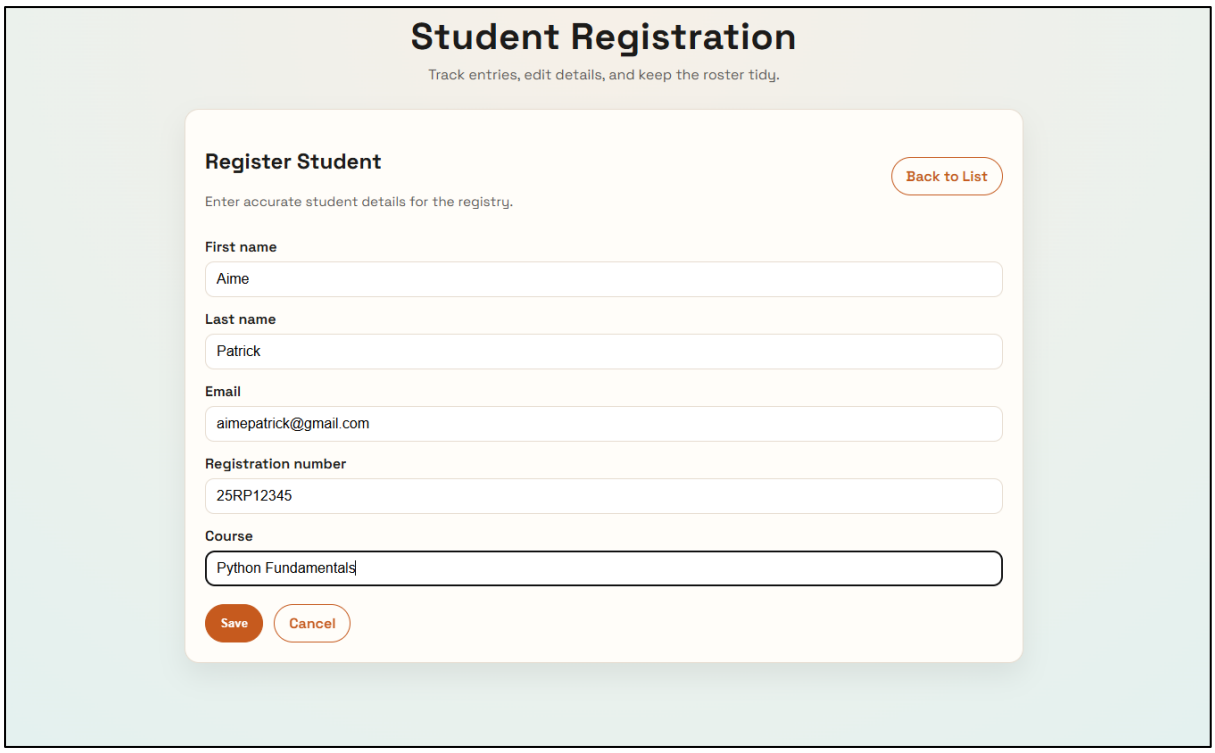
```
urlpatterns = [
    path("", views.student_list, name="student_list"),
    path("students/new/", views.student_create, name="student_create"),
    path("students/<int:pk>/edit/", views.student_update, name="student_update"),
    path("students/<int:pk>/delete/", views.student_delete, name="student_delete"),
]
```

11. **Frontend and backend design**
    - **HTML form design**
      - **The student registration form is built from StudentForm and rendered here: crud_app/templates/crud_app/student_form.html.**
    - **Database design**
      - **The table schema is the Student model in crud_app/models.py.**
      - **Each model field becomes a database column.**
12. **Model Database Design**

```
class Student(models.Model):
    first_name = models.CharField(max_length=100)
    last_name = models.CharField(max_length=100)
    email = models.EmailField(unique=True)
    registration_number = models.CharField(max_length=30, unique=True)
    course = models.CharField(max_length=120)
    created_at = models.DateTimeField(auto_now_add=True)
```

13. **Insert, retrieve, update, delete**

- **Insert (Create)**



- **View: crud_app/views.py**

```
def student_create(request):
    if request.method == "POST":
        form = StudentForm(request.POST)
        if form.is_valid():
            form.save()
            return redirect("student_list")
    else:
        form = StudentForm()

    return render(
        request,
        "crud_app/student_form.html",
        {"form": form, "title": "Register Student"},
    )
```

- **Form: crud_app/forms.py**

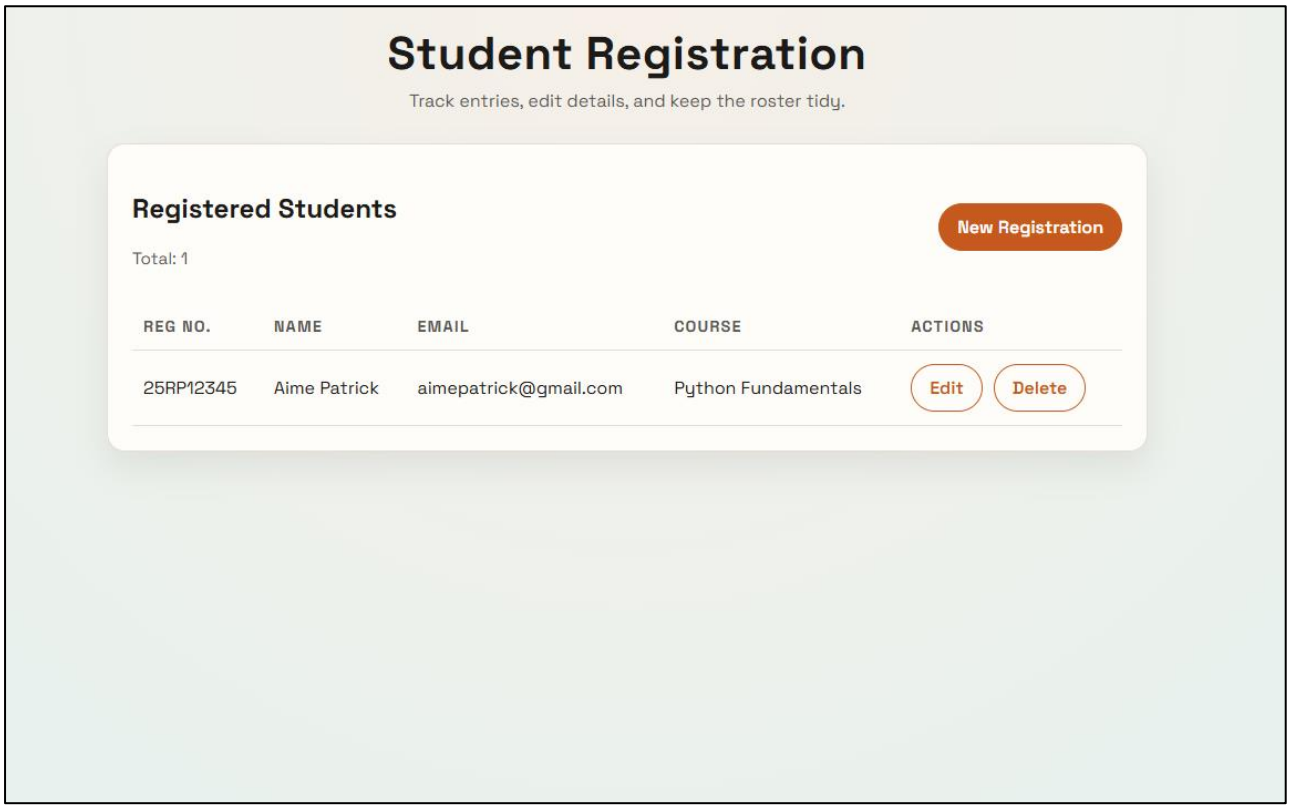
```
from django import forms

from . models import Student


class StudentForm(forms.ModelForm):
    class Meta:
        model = Student
        fields = [
```

```
            "first_name",
            "last_name",
            "email",
            "registration_number",
            "course",
        ]
        widgets = {
            "first_name": forms.TextInput(attrs={"placeholder": "First name"}),
            "last_name": forms.TextInput(attrs={"placeholder": "Last name"}),
            "email": forms.EmailInput(attrs={"placeholder": "email@example.com"}),
            "registration_number": forms.TextInput(
                attrs={"placeholder": "e.g. REG-2026-001"}
            ),
            "course": forms.TextInput(attrs={"placeholder": "Course name"}),
        }
```

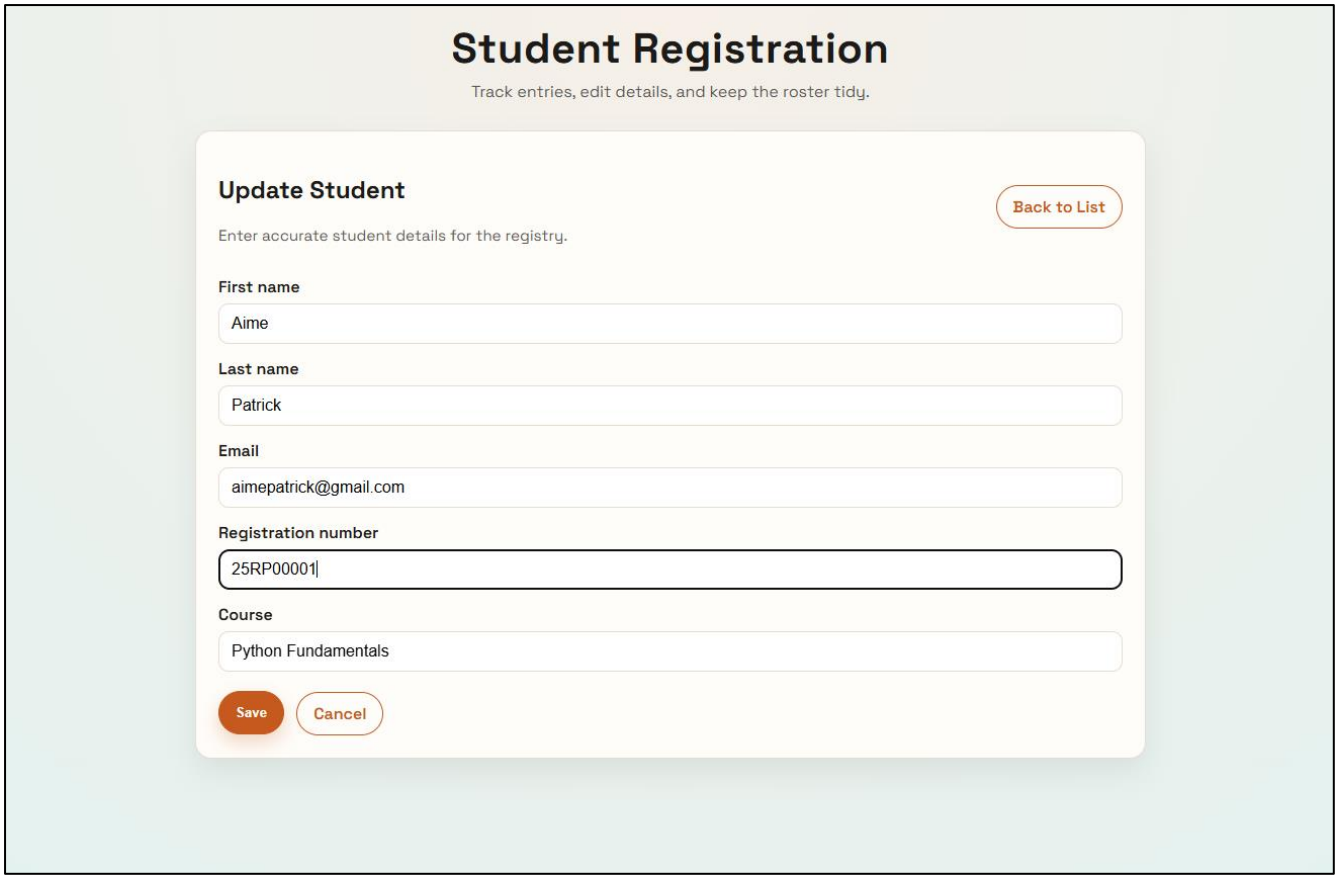
- **Retrieve (Read)**



  - **View + template: crud_app/views.py, crud_app/templates/crud_app/student_list.html**

```
def student_list(request):
    students = Student.objects.order_by("-created_at")
    return render(request, "crud_app/student_list.html", {"students": students})
```

- **Update**

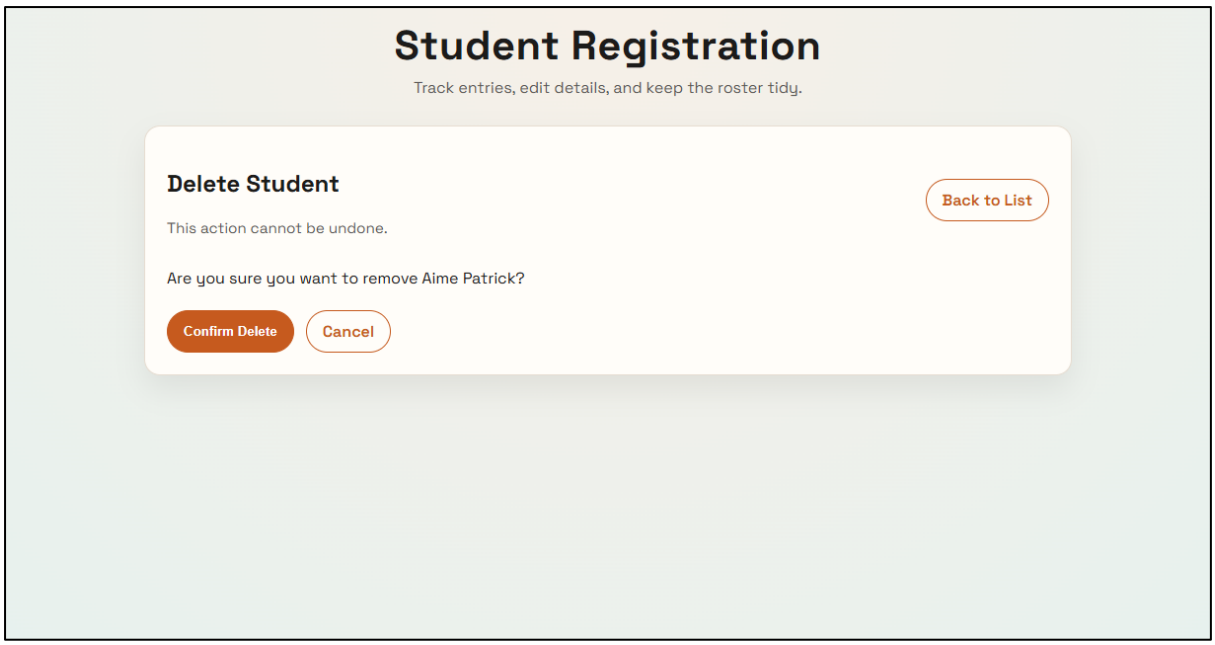


- **View: crud_app/views.py**

```
def student_update(request, pk):
    student = get_object_or_404(Student, pk=pk)
    if request.method == "POST":
        form = StudentForm(request.POST, instance=student)
        if form.is_valid():
            form.save()
            return redirect("student_list")
    else:
        form = StudentForm(instance=student)

    return render(
        request,
        "crud_app/student_form.html",
        {"form": form, "title": "Update Student"},
    )
```

- **Delete**



- **View + confirmation page: crud_app/views.py, crud_app/templates/crud_app/student_confirm_delete.html**

```
def student_delete(request, pk):
    student = get_object_or_404(Student, pk=pk)
    if request.method == "POST":
        student.delete()
        return redirect("student_list")

    return render(
        request,
        "crud_app/student_confirm_delete.html",
        {"student": student},
    )
```