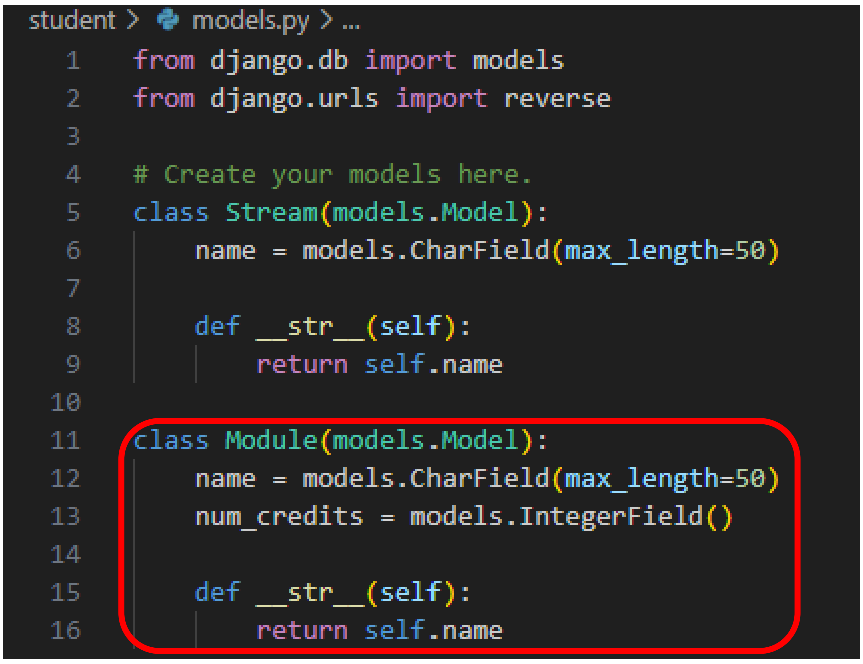
Lab 5 Part (3)

Adding a new Database Model

In this exercise we will look at how adding a new database model called **Module** to the **student/models.py** and then create a many to many relationship between the **Module** and the **Student** classes.

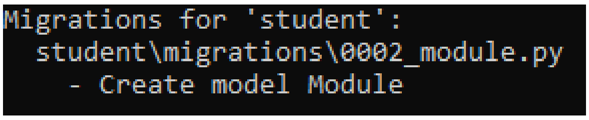
In VS Code, open the project for lab 5 and add the following code to **student/models.py** at the location shown below:



```
from django.db import models
from django.urls import reverse

# Create your models here.
class Stream(models.Model):
    name = models.CharField(max_length=50)

    def __str__(self):
        return self.name

class Module(models.Model):
    name = models.CharField(max_length=50)
    num_credits = models.IntegerField()

    def __str__(self):
        return self.name
```

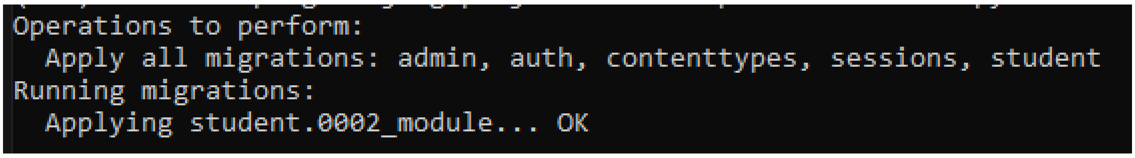
In Windows Command line run the following two commands to perform the database migrations and note the output as shown here:

python manage.py makemigrations student



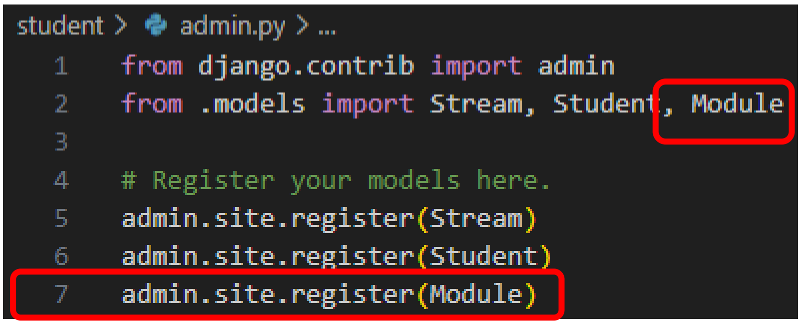
```
Migrations for 'student':
  student\migrations\0002_module.py
    - Create model Module
```

python manage.py migrate



```
Operations to perform:
  Apply all migrations: admin, auth, contenttypes, sessions, student
Running migrations:
  Applying student.0002_module... OK
```

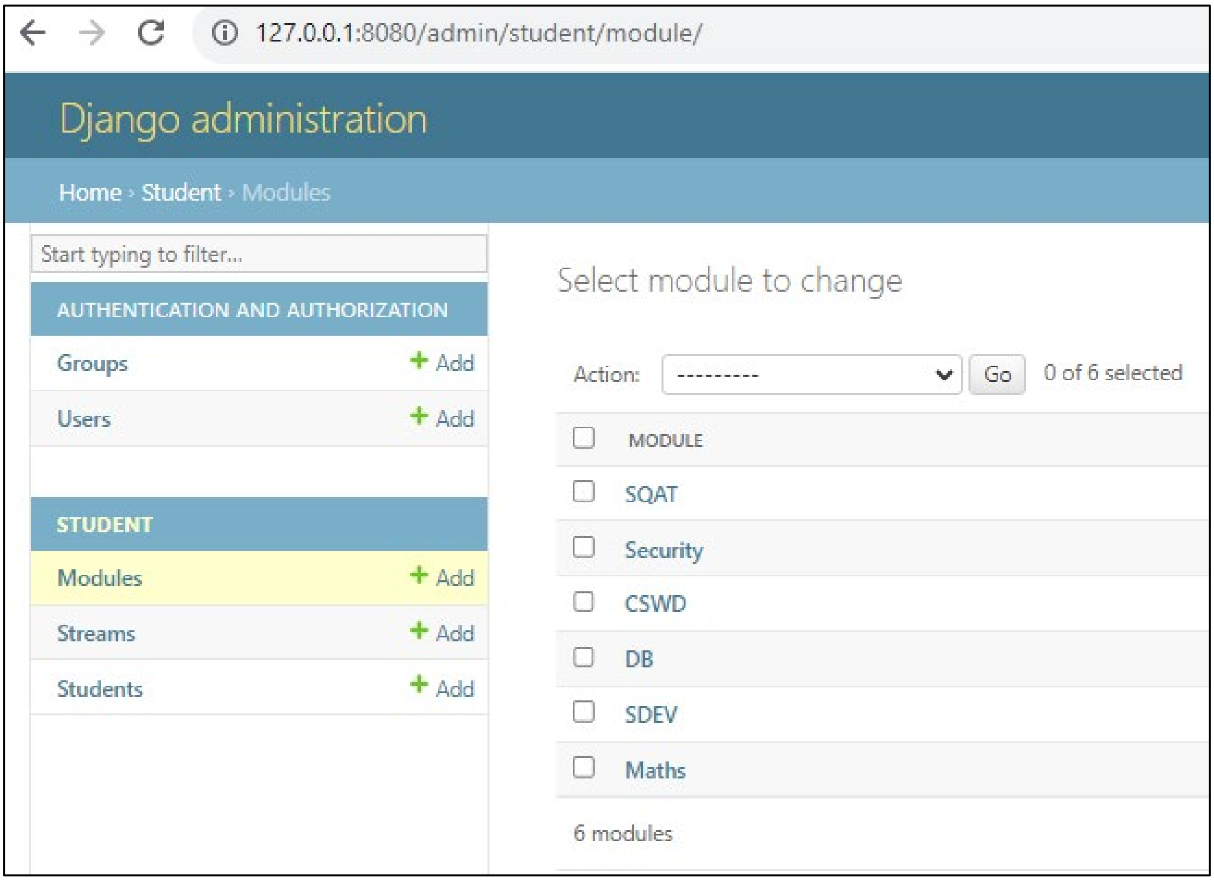
Add the following code to **student/admin.py** to register the model in Django admin:



student > admin.py > ...

```python
from django.contrib import admin
from .models import Stream, Student, Module

# Register your models here.
admin.site.register(Stream)
admin.site.register(Student)
admin.site.register(Module)
```

Run the server and log into Django admin and add the following entries to the **Module** database table:



127.0.0.1:8080/admin/student/module/

Django administration

Home › Student › Modules

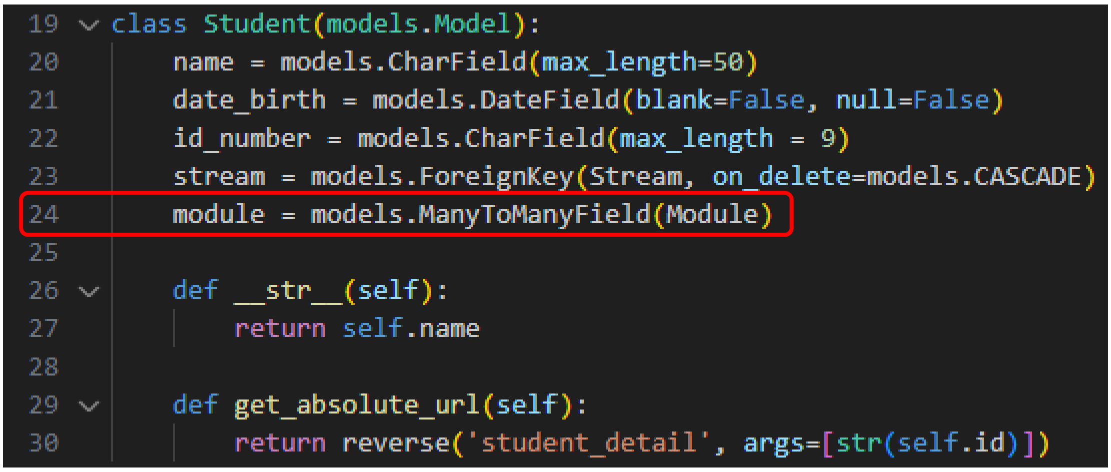
Select module to change

Action: --------- Go 0 of 6 selected

□	MODULE
□	SQAT
□	Security
□	CSWD
□	DB
□	SDEV
□	Maths

6 modules

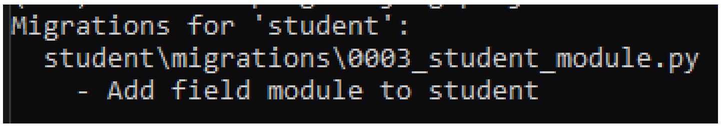
Next, we want to create a relationship between the **Student** and **Module** database models. A student can take many modules and the same module can be taken by many students. This scenario can be represented as a **Many to Many** relationship in Django. To define this relationship, add the following line of code to the **Student** class in **student/models.py**:



```python
class Student(models.Model):
    name = models.CharField(max_length=50)
    date_birth = models.DateField(blank=False, null=False)
    id_number = models.CharField(max_length = 9)
    stream = models.ForeignKey(Stream, on_delete=models.CASCADE)
    module = models.ManyToManyField(Module)

    def __str__(self):
        return self.name

    def get_absolute_url(self):
        return reverse('student_detail', args=[str(self.id)])
```

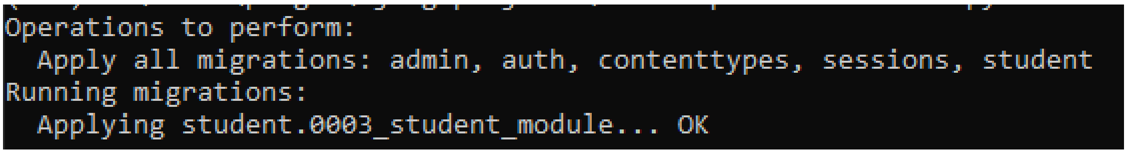
In Windows Command line run the following two commands to perform the database migrations and note the output as shown here:

```
python manage.py makemigrations student
```



```
Migrations for 'student':
  student\migrations\0003_student_module.py
    - Add field module to student
```

```
python manage.py migrate
```



```
Operations to perform:
  Apply all migrations: admin, auth, contenttypes, sessions, student
Running migrations:
  Applying student.0003_student_module... OK
```

If you open the database file in DB Browser you will see a new associative table called student_student_module as shown here:

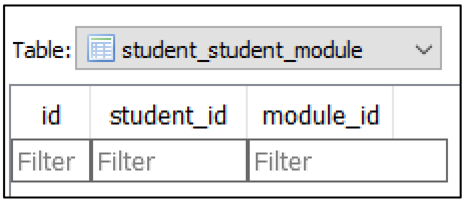
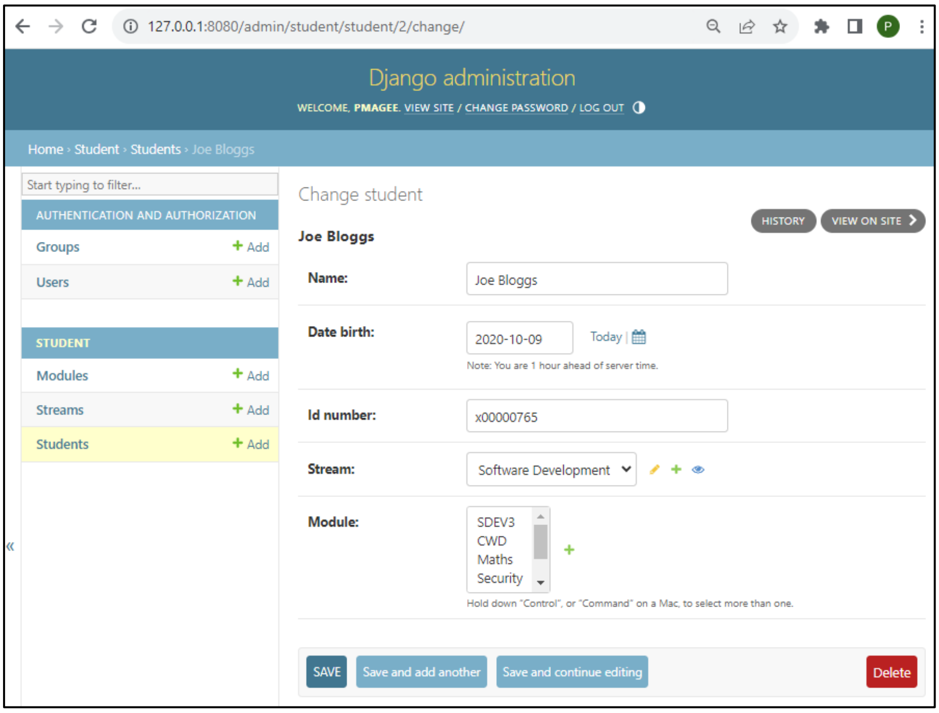


Table: student_student_module

id	student_id	module_id
Filter	Filter	Filter

Run the server and log into Django admin and click on one of the **Student** entries to edit it and you will see a new section called **Module** with a list of all the modules. Select all the modules and do the same for each **Student** entry:



127.0.0.1:8080/admin/student/student/2/change/

Django administration

WELCOME, **PMAGEE**. VIEW SITE / CHANGE PASSWORD / LOG OUT

Home › Student › Students › Joe Bloggs

Start typing to filter...

AUTHENTICATION AND AUTHORIZATION

- Groups + Add
- Users + Add

STUDENT

- Modules + Add
- Streams + Add
- Students + Add

Change student

HISTORY | VIEW ON SITE

Joe Bloggs

Name: Joe Bloggs

Date birth: 2020-10-09 Today |

Note: You are 1 hour ahead of server time.

Id number: x00000765

Stream: Software Development

Module: SDEV3
CWD
Maths
Security

Hold down "Control", or "Command" on a Mac, to select more than one.

SAVE | Save and add another | Save and continue editing | Delete

Go back to DB Browser and refresh the database and you should see the entries in the associative table:

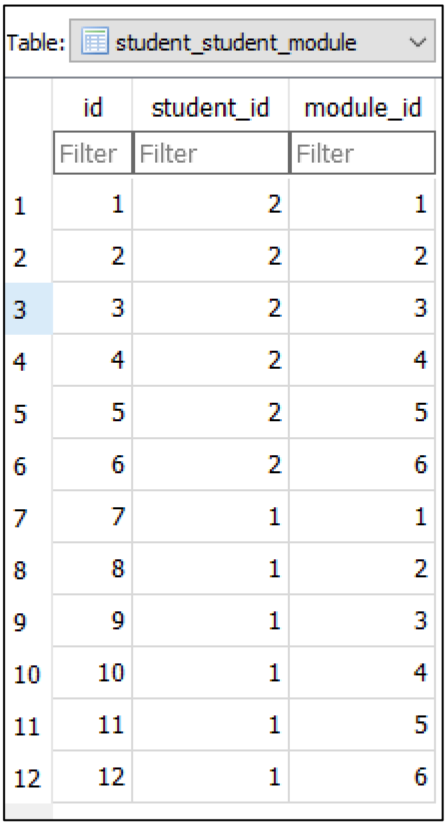
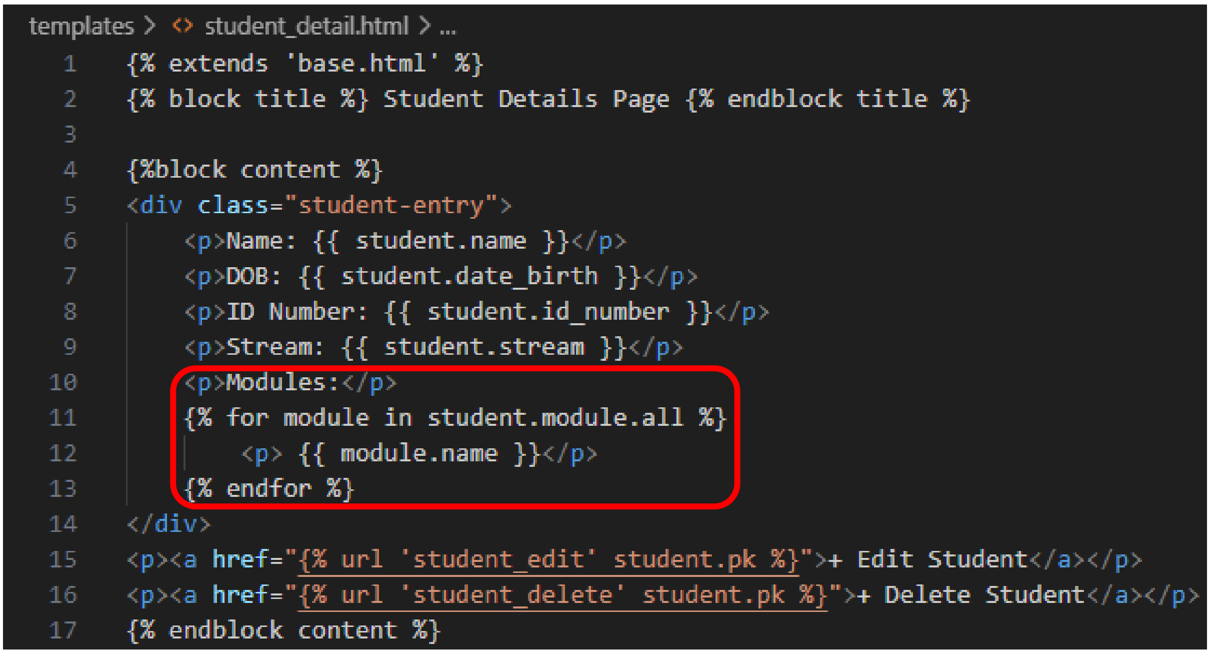


Table: student_student_module

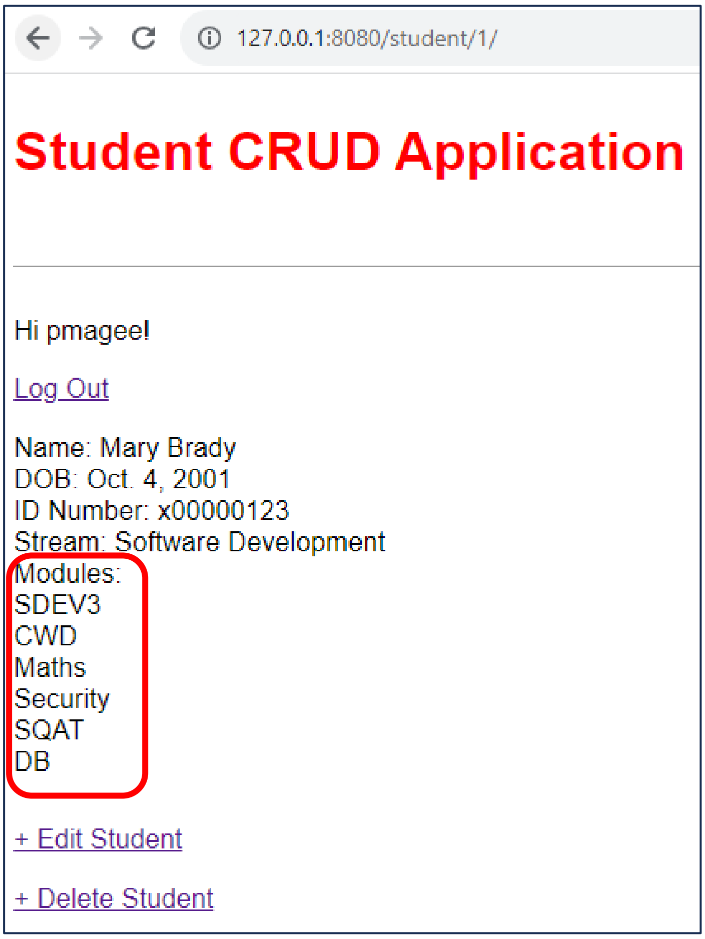
	id	student_id	module_id
	Filter	Filter	Filter
1	1	2	1
2	2	2	2
3	3	2	3
4	4	2	4
5	5	2	5
6	6	2	6
7	7	1	1
8	8	1	2
9	9	1	3
10	10	1	4
11	11	1	5
12	12	1	6

In order to show the modules on the **student_detail.html** page, add the following code to the template:



```
{% extends 'base.html' %}
{% block title %} Student Details Page {% endblock title %}

{%block content %}
<div class="student-entry">
    <p>Name: {{ student.name }}</p>
    <p>DOB: {{ student.date_birth }}</p>
    <p>ID Number: {{ student.id_number }}</p>
    <p>Stream: {{ student.stream }}</p>
    <p>Modules:</p>
    {% for module in student.module.all %}
        <p> {{ module.name }}</p>
    {% endfor %}
</div>
<p><a href="{% url 'student_edit' student.pk %}">+ Edit Student</a></p>
<p><a href="{% url 'student_delete' student.pk %}">+ Delete Student</a></p>
{% endblock content %}
```

Access the home page and click on a link to view the student details page and you will see that the list of modules is also displayed for the student as shown below:



Student CRUD Application

Hi pmagee!

Log Out

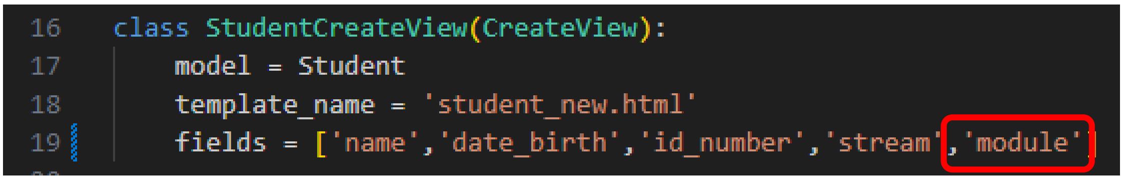
Name: Mary Brady
DOB: Oct. 4, 2001
ID Number: x00000123
Stream: Software Development
Modules:
SDEV3
CWD
Maths
Security
SQAT
DB

+ Edit Student

+ Delete Student

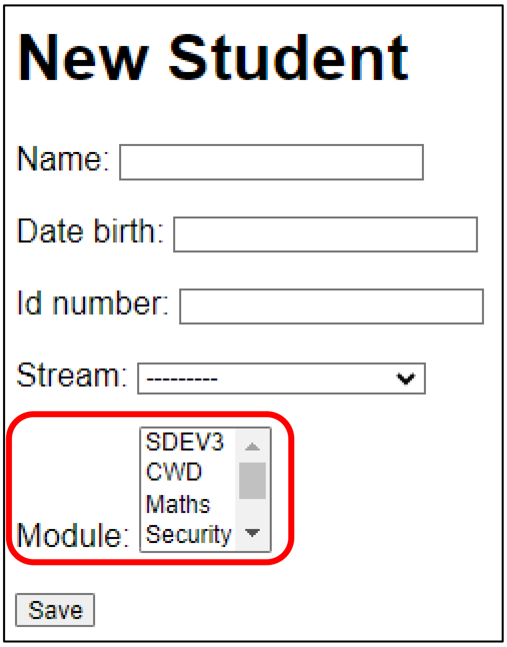
We need to make a change to the functionality of our New Student so that we are able to select the modules for a new student.

Add the following code to **student/views.py**:



```
class StudentCreateView(CreateView):
    model = Student
    template_name = 'student_new.html'
    fields = ['name','date_birth','id_number','stream','module']
```

Run the server and load the “New Student” page and you should see that a new label & widget has been added to the form to allow us to select the modules. Go ahead and add a new student and select 4 modules.



New Student

Name:

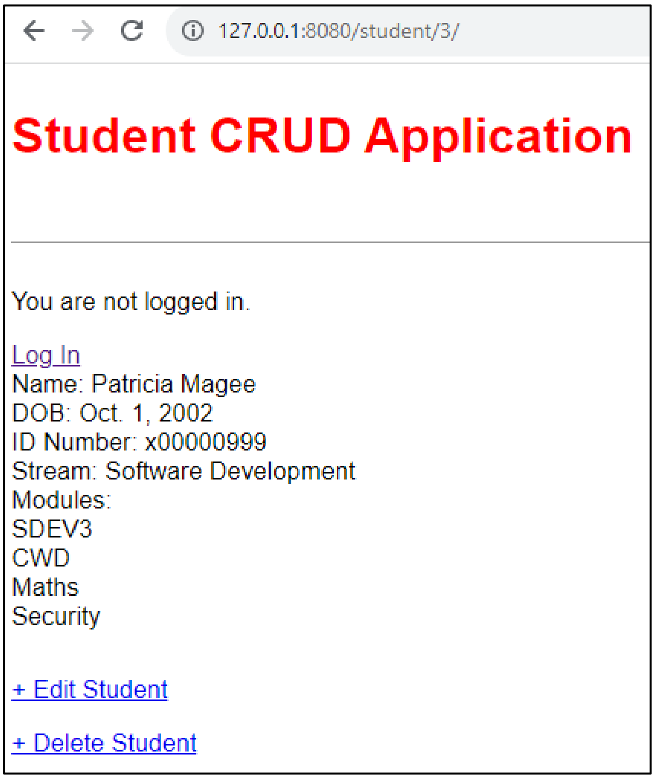
Date birth:

Id number:

Stream: ---------

Module: SDEV3
CWD
Maths
Security

View the details of the new student & you should see that there are just 4 modules listed as shown below:



Student CRUD Application

You are not logged in.

Log In
Name: Patricia Magee
DOB: Oct. 1, 2002
ID Number: x00000999
Stream: Software Development
Modules:
SDEV3
CWD
Maths
Security

+ Edit Student

+ Delete Student

Run the following git commands to update the **lab 5** local and remote repositories:

```
git add -A
git commit -m “lab 5 part 3 commit”
git push -u origin main
```