**Python Package Concept with Modules – School Management System**

A **Python package** is a collection of modules organized in directories with an \_\_init\_\_.py file. Below is a **School Management System** implemented as a Python package with multiple modules.

Project Structure



## **Step 1: Create the Package Directory**

Create a folder named **school\_management**.

## **Step 2: Create** \_\_init\_\_.py **(Package Initialization)**

The **\_\_init\_\_.py** file makes the folder a package. It can be empty or contain initialization code.

**Code:**

# school\_management/\_\_init\_\_.py

print("School Management System Package Initialized")

## **Step 3: Create Modules (students, teachers, courses)**

### ****Module 1:**** students.py ****(Handles Student Operations)****

# school\_management/students.py

students = []

def add\_student(name, age, grade):

 student = {"name": name, "age": age, "grade": grade}

 students.append(student)

 return f"Student {name} added successfully!"

def get\_students():

 return students

**Module 2: teachers.py (Handles Teacher Operations)**

# school\_management/teachers.py

teachers = []

def add\_teacher(name, subject):

 teacher = {"name": name, "subject": subject}

 teachers.append(teacher)

 return f"Teacher {name} added successfully!"

def get\_teachers():

 return teachers

**Module 3: courses.py (Handles Course Management)**

# school\_management/courses.py

courses = []

def add\_course(course\_name, teacher\_name):

 course = {"course\_name": course\_name, "teacher": teacher\_name}

 courses.append(course)

 return f"Course {course\_name} assigned to {teacher\_name}!"

def get\_courses():

 return courses

## **Step 4: Create** main.py **(Entry Point)**

This script imports the package modules and executes them.

**# main.py**

from school\_management import students, teachers, courses

# Adding students

print(students.add\_student("Alice", 14, "8th Grade"))

print(students.add\_student("Bob", 15, "9th Grade"))

# Adding teachers

print(teachers.add\_teacher("Mr. Smith", "Mathematics"))

print(teachers.add\_teacher("Ms. Johnson", "Science"))

# Assigning courses

print(courses.add\_course("Algebra", "Mr. Smith"))

print(courses.add\_course("Physics", "Ms. Johnson"))

**# Display Data**

print("\nStudents List:", students.get\_students())

print("\nTeachers List:", teachers.get\_teachers())

print("\nCourses List:", courses.get\_courses())

## **Step 5: Run the** main.py **Script**

Run the script to see the School Management System in action.

### ****Expected Output:****

School Management System Package Initialized

Student Alice added successfully!

Student Bob added successfully!

Teacher Mr. Smith added successfully!

Teacher Ms. Johnson added successfully!

Course Algebra assigned to Mr. Smith!

Course Physics assigned to Ms. Johnson!

Students List: [{'name': 'Alice', 'age': 14, 'grade': '8th Grade'}, {'name': 'Bob', 'age': 15, 'grade': '9th Grade'}]

Teachers List: [{'name': 'Mr. Smith', 'subject': 'Mathematics'}, {'name': 'Ms. Johnson', 'subject': 'Science'}]

Courses List: [{'course\_name': 'Algebra', 'teacher': 'Mr. Smith'}, {'course\_name': 'Physics', 'teacher': 'Ms. Johnson'}]

**Concepts Covered:**

**Python Package:** school\_management (A directory with \_\_init\_\_.py)
**Modules:** students.py, teachers.py, courses.py
**Functions in Modules:** To add and retrieve data
**Importing Modules:** Using from package import module

This example demonstrates a **modular, reusable, and organized** school management system in Python!