**Coutiato Project**

**1. 🎯 Goal of the Project**

The Coutiato Software App is a smart course recommendation system aimed at helping students transitioning from secondary to tertiary education (such as universities or colleges) choose courses that are **academically appropriate** and **personally fulfilling**.

The main challenge you're addressing is that many students:

* Pick university courses they are not interested in,
* Rely only on cluster points or peer influence without guidance,
* End up dropping out or underperforming due to lack of alignment between passion and academic capability.

So, the system you're building will make intelligent course suggestions using both:

* **Academic data** (cluster points + subjects taken),
* **Personal interests** (what the student enjoys or is passionate about).

**2. ⚙️ How the System Works (Functionality)**

**Step 1: Data Collection (User Input)**

The student/user will enter:

* Their **KCSE cluster points** or grades (possibly broken down into subject-wise scores),
* Select the **subjects** they took (e.g., Physics, Chemistry, Business Studies),
* Indicate their **interests** or what they enjoy doing, e.g., coding, drawing, farming, organizing events.

**Step 2: Filtering Courses**

The system filters all possible courses using:

* Subject combinations (some courses require specific subjects),
* Minimum cluster points (to ensure eligibility).

**Step 3: AI Model Matching**

Using a trained Machine Learning model:

* The filtered list is passed through a recommender system,
* The student's personal interests are matched with each course using Natural Language Processing (NLP) or keyword matching,
* A maximum of **two best-fit courses** are selected.

**Step 4: Course Insight & Guidance**

For each suggested course, the system displays:

* 🔍 **Reason for recommendation** (based on academic & interest alignment),
* 🎓 **Overview of the course** and what it involves,
* 🏭 **Industries and job roles** the graduate can work in,
* 💸 **Expected pay range** and career growth potential,
* 🛠️ **Key skills** required to succeed and stand out.

**Step 5: Congratulatory Message**

A friendly and motivating congratulatory message is shown, encouraging the student and giving them a sense of confidence in their choice.

**3. 💡 Machine Learning & AI Use**

The AI model in the system can use a **classification** or **recommendation algorithm**. Here's how you might approach it:

* **Input Features:**
  + Cluster points
  + Subject combinations
  + Interest keywords
* **Target Labels (during training):**
  + Course options tagged with successful student profiles
* **Model Type:**
  + Decision Trees or Random Forest (for interpretability),
  + Or a hybrid of rule-based + machine learning recommender

You could later enhance this with:

* **NLP sentiment analysis** for interpreting open-ended interest answers,
* **Feedback loops** to improve suggestions based on user satisfaction or actual course uptake.

**4. 📱 UI/UX and User Journey**

* Simple UI to input cluster and subject data
* Multiple choice or free text for interests
* Progress bar showing the process: Academic Input → Interests → Recommendation
* Responsive design for mobile and desktop
* Clear, encouraging, and youth-friendly tone

**5. 💻 Technology Stack**

| **Component** | **Tools** |
| --- | --- |
| **Frontend** | React.js |
| **Backend API** | FastAPI |
| **Machine Learning** | Scikit-Learn or TensorFlow |
| **Database** | PostgreSQL (for course & user data) |
| **Hosting** | Render / Railway / Vercel (Frontend), or Heroku / AWS (Backend + Model) |

**6. 📈 Future Enhancements**

* Personalized dashboards
* Integration with KUCCPS or tertiary institutions
* Multilingual support (English + Kiswahili + local dialects)
* In-app mentorship or alumni interviews
* Course success stories and testimonials
* PDF download of the recommendation report

**🧠 Contributors**

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