



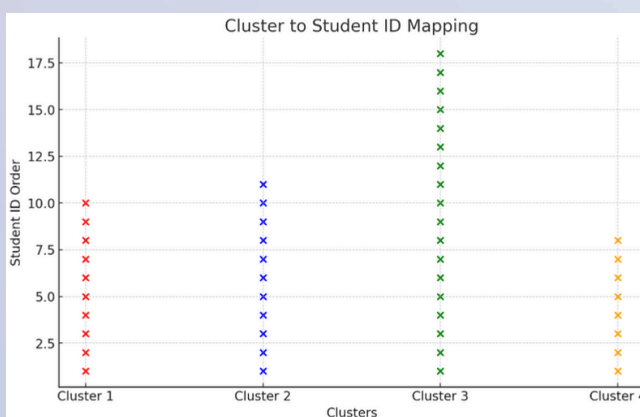
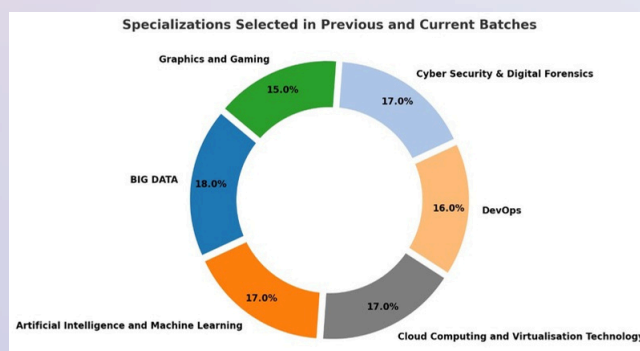
Abstract

This project introduces an innovative dual-purpose academic support system designed to enhance both student guidance and educational management. The system employs advanced algorithms to address two critical aspects of academic progression: specialization selection for students and performance-based grouping for educators.

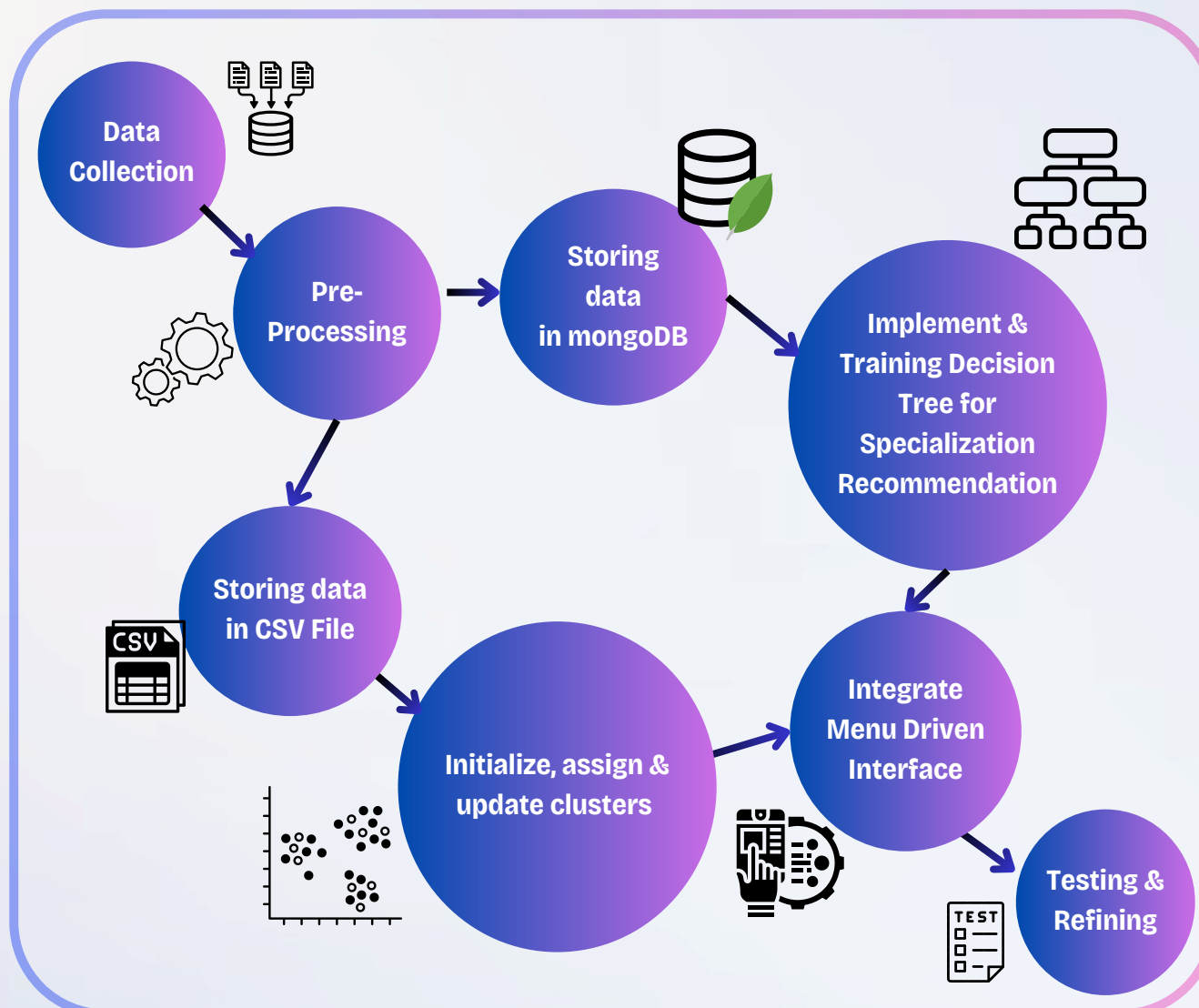
Introduction

- Students in their first year often struggle to select specializations that align with their interests and academic strengths
- This often leads to poor academic choices, affecting career trajectories and overall performance
- We have designed a system to help students make informed specialization decisions based on their preferences and academic performance
- Additionally, our system groups students by performance to provide targeted support and optimize resource allocation.

Data Visualization



Methodology



Run-Time Results

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Enter SAP ID: 500108542

Enter your overall 1st year CGPA: 8.6

Enter Grade for C Programming Language (CPL) (0, A+, A, B+, B, C+, C, D, F): o

Enter Grade for Data Structures and Algorithms (DSA) (0, A+, A, B+, B, C+, C, D, F): o

Enter Grade for Python Programming (0, A+, A, B+, B, C+, C, D, F): a

Enter Grade for Computer Organization and Architecture (COA) (0, A+, A, B+, B, C+, C, D, F): b

Enter Grade for Advanced Engineering Mathematics (AEM) (0, A+, A, B+, B, C+, C, D, F): c

Enter Grade for Physics (0, A+, A, B+, B, C+, C, D, F): f

Do you like exploring cloud platforms and understanding how they store and process data? (1-5) : 3

Are you interested in learning how distributed systems process big data across multiple machines? (1-5) : 2

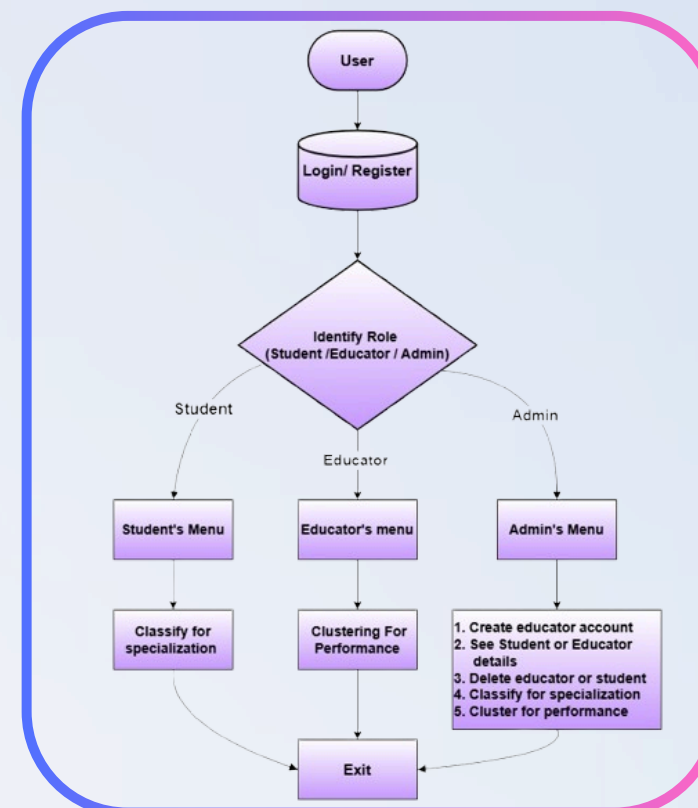
Are you interested in creating visual designs, animations, AR, VR or working with game mechanics? (1-5) : 3

Have you ever been interested in how game engines, like Unity or Unreal, work behind the scenes? (1-5) : 2

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Suggested Specialization: Cloud Computing and Virtualisation Technology
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Final Clusters After 5 Iterations			
Cluster 1	Cluster 2	Cluster 3	Cluster 4
500101897	500109754	500108020	500109927
500105545	500108707	500110490	500101726
500109627	500101970	500108261	500105642
500107615	500093950	500105401	500102243
500107148	500107761	500107565	500110794
500083620	500107156	500107193	500108706
500107366	500111697	500106951	500093995
500082772	500110607	500109330	500108342
500109805	500105682	500105016	
500107098	50010326	500109497	
	500106041	500107049	
		500105700	
		500096292	
		500083540	
		500108348	
		500108601	
		500082524	
		500107769	
		500102244	

Working Architecture



Conclusion

- Offers personalized academic guidance for students, aligning specializations with their performance and preferences while supporting educators in targeted teaching and resource allocation.
- Enhances academic planning, progress tracking, and alignment of aspirations with strengths, fostering a student-centred learning environment.

References

- [1] Singh, Samrat, and Vikesh Kumar. "Performance analysis of engineering students for recruitment using classification data mining techniques." International Journal of Science, Engineering and Computer Technology 3, no. 2 (2013): 31.
- [2] Le Quy, Tai, Gunnar Friege, and Eirini Ntouts. "A review of clustering models in educational data science toward fairness-aware learning." Educational data science: Essentials, approaches, and tendencies: Proactive education based on empirical big data evidence (2023): 43-94.
- [3] Bobâlcă, Claudia, Oana Țugulea, and Cosmina Bradu. "How are the students selecting their bachelor specialization? A qualitative approach." Procedia economics and Finance 15 (2014): 894-902.
- [4] Kurniawan, Tri Basuki, and Indah Hidayanti. "Classification Algorithms to Determine Students' Specialization in a Higher Education Institution." Journal of Data Science 2023 (2023).