SMARTHIRE

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BML Munjal University | 2024

PROBLEM STATEMENT

Traditional resume screening is manual, time-consuming, and biased. Existing ATS rely on basic keyword matching, missing contextual nuances. Key metrics like skills and experience are underutilized, leading to ineffective hiring.

Objectives

• Develop an AI-based resume parsing and job matching system.
• Implement weighted scoring for customizable criteria.
• Ensure accurate and unbiased candidate ranking.
• Provide an intuitive, user-friendly interface.
• Enhance transparency with explainable AI features.

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DATASET

- **Total Resumes:** 150
- **Key Columns:**
- Personal Information: Name, Contact Email, Phone Number, LinkedIn, GitHub
- Work Experience: Job Title, Company, Start/End Dates, Location, Responsibilities
- Projects: Titles, Descriptions, Tech Stacks for 2 Projects
- Skills: Proficient, Experienced, Familiar
- Education: Degree, Institution, Graduation Year, GPA
- Achievements: Notable accomplishments

Purpose:
Comprehensive dataset covering all critical aspects for candidate evaluation and effective shortlisting.

EDA

CGPA Distribution

Top 5 columns with the most NaN values:
- GitHub Profile: 19 missing values
- LinkedIn Profile: 17 missing values
- Graduation Year: 17 missing values
- Achievements: 16 missing values
- Location (1st Experience): 14 missing values

1. HTML & CSS dominate web development with 22.4% and 21.0% usage, respectively.
2. Python (14.2%) and JavaScript (6.8%) are key for data science and web development.
3. Most students have a CGPA between 7 and 8.
4. A smaller number of students have a CGPA above 8.
5. Very few students have a CGPA below 5.

Top 10 Most Used Technologies in Projects
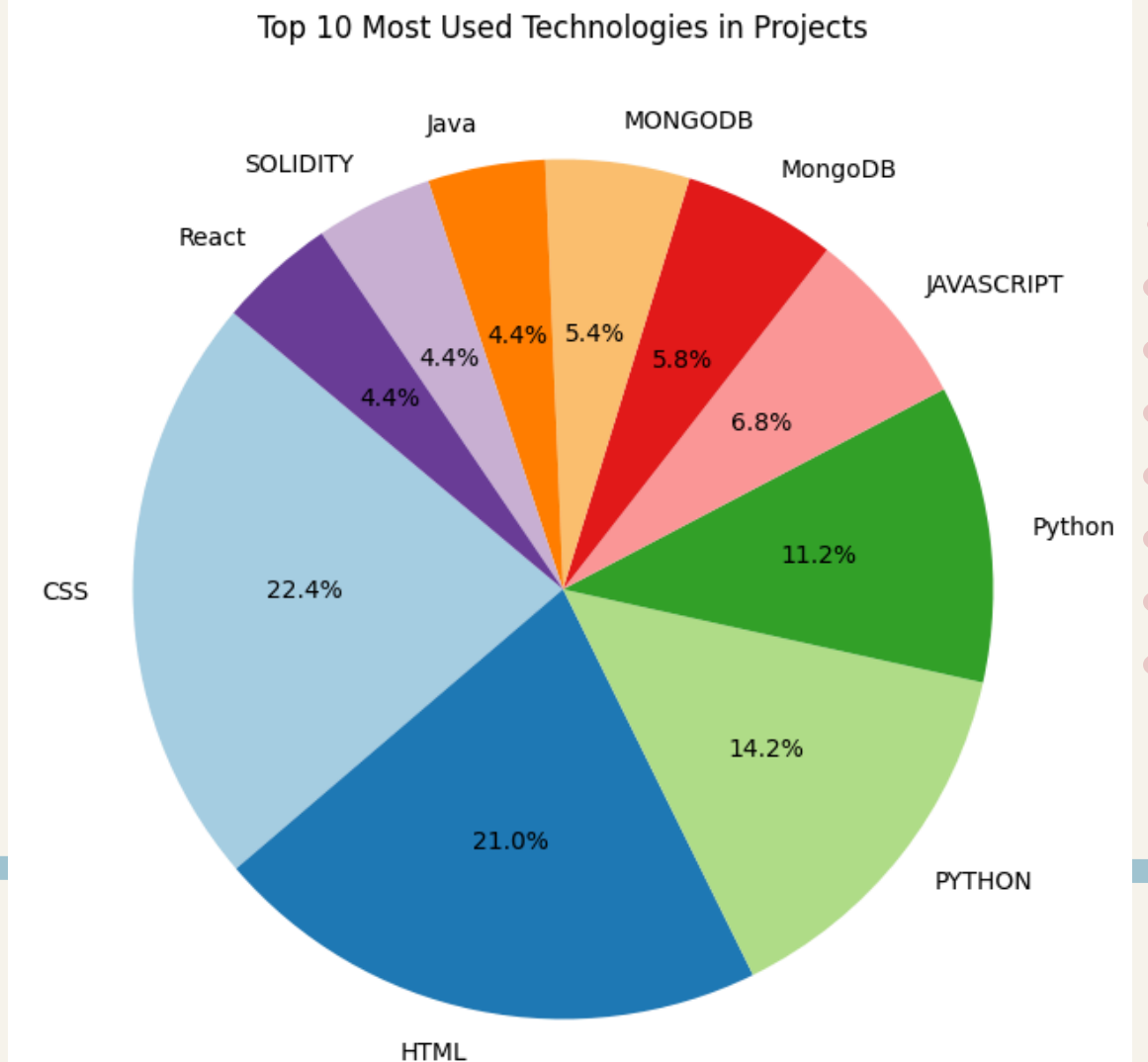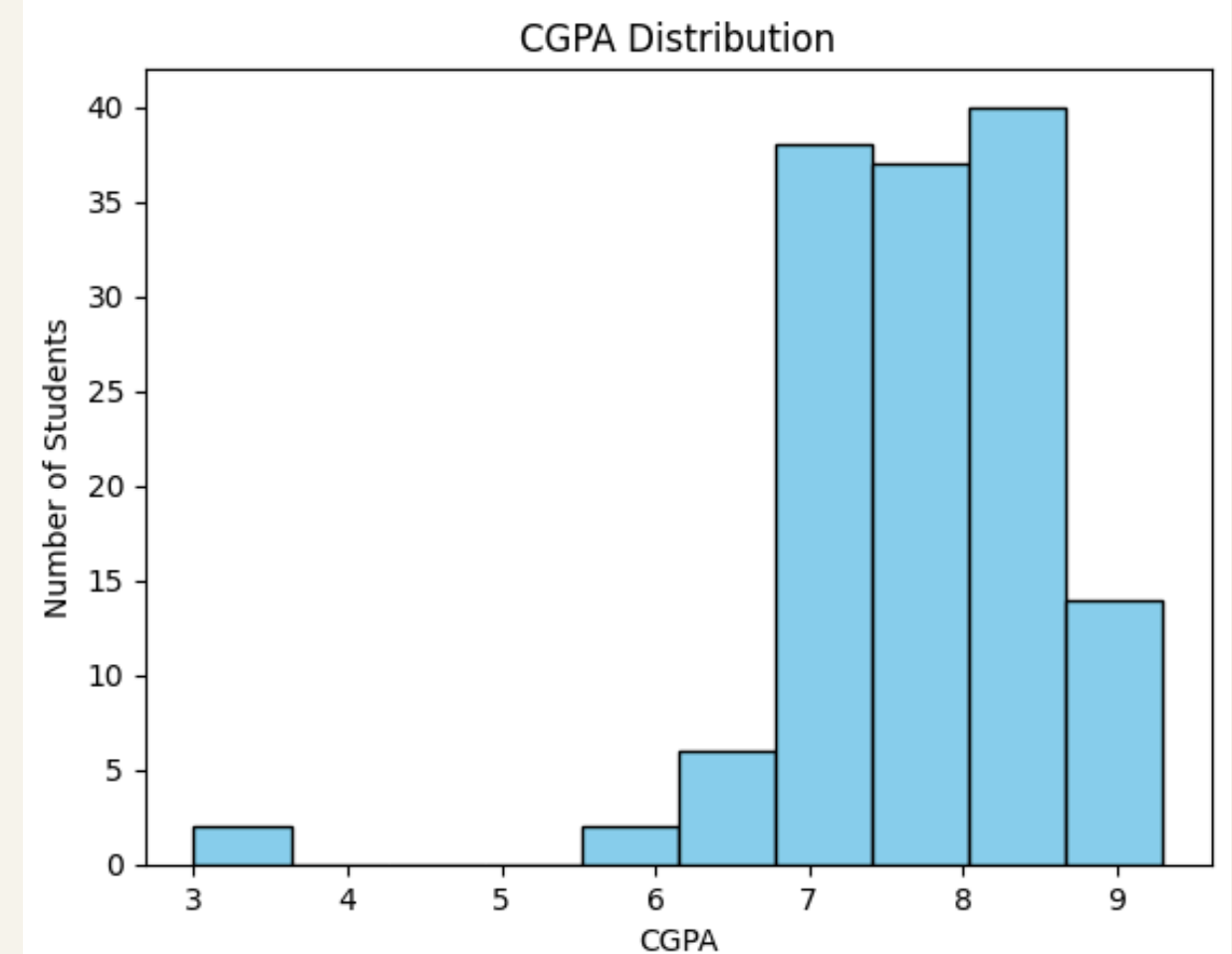
ISSUES WITH OTHER MODELS

1

Parsing Resume

When using NLP to parse data from resumes, we encountered issues with generating a consistent dataset due to discrepancies in PDF formats and varying alignments across CVs. This lack of uniformity in structure often led to misinterpretation or incomplete extraction of information.

Name	Email	Phone	LinkedIn	GitHub	Job Title 1st Exp	Company 1st Exp	Start Date 1st Exp	End Date 1st Exp	Location 1st Exp
Abhinav KasulaSeeking	abhinav.kasula.09@gmail.com	+91 9319615489				HTML, CSS,		PYTHON2022	
Aditya	adityaraj2002dav@gmail.com	990715 2141			Li- Mat Industries	Front End Developer	May 2022	July 2022	
Aditya RanaEndeavor	aditya.rana.20cse@bmu.edu.in	7818995363				BangaloreKarnataka			
Afraz Ahmed ZiaHighly		+91 8318817726				JAVA, GENETIC ALGORITHM, JS, MYSQL| UI/UX DESIGNER	2022May 2022	July 2022	UI/UX DESIGNER
Abhishek Sharma		020621			SMARTTER'S STUDIO	GROUP LEAD	May 2022	sharma 8950	REACTJS	NODEJS	NEXTJS	MONGODB

That's why we switched to GPT-4o-mini, an affordable solution that delivered significantly more accurate results, effectively handling the inconsistencies in PDF formats and CV alignments.

RESULTS WITH 4O-MINI

Name	Contact Email	Phone Number	LinkedIn Profile	GitHub Profile	Job Title (1st Experience)
Rakesh Gupta Kotha	rakesh.guptakotha.20cse@bmu.edu.in	9391137589	https://www.linkedin.com/in/rakesh-gupta-831a891bb/	https://github.com/rakeshguptak	WEB DEVELOPER
Rakshit Sharma	rakshit.sharma606@gmail.com	7065847740	http://www.linkedin.com/in/rakshit-sharma-176a461ba	https://github.com/Rakshit-sh54	Backend Java Developer
Ravindhranadh Thakkellapati	ravindhranadh1969@gmail.com	7288918840	https://www.linkedin.com/in/ravindhranadh-thakkellapati-419707203/	https://github.com/Ravindhranadh1969	SOFTWARE DEVELOPER
Razina Khanam	razinakhanam06@gmail.com	7893080627			Thesis
Rishi Raj Singh	rishiraj2954@gmail.com	+91 7014975299			
Ruthvik Reddy Thatikonda	thatikonda.ruthvikreddy.20cse@bmu.edu.in	9701617208	https://www.linkedin.com/Ruthvik%20Reddy%20Thatikonda	https://www.github.com/ruthvik888	FRONTEND DEVELOPER INTERN
Sachin Verma	sachin.verma.20cse@bmu.edu.in	9315135625	https://www.linkedin.com/in/	https://github.com/Sachin2077	Website Developer
Sahil Kochhar	sahilkochhar323@GMAIL.COM	9560184198	https://www.linkedin.com/in/sahil-kochhar-bb2156193/	https://github.com/sahill-k	FRONT-END DEVELOPER
SaiEshwar Akshintala	sai.eshwarakshintala.20cse@bmu.edu.in	+91 9493922043	https://www.linkedin.com/in/seaak/	https://github.com/CheezPotato	Thesis
Sairamreddy Rajigiri	rsairamreddy555@gmail.com	9182440254	https://www.linkedin.com/in/sai-ram-reddy-rajigiri-0a8a56231/	https://github.com/sairamreddyr	WEB DEVELOPER
SaiVamsiVignesh Kayitha	vamsi.vignesh.20cse@bmu.edu.in	9848514341	li-vamsi vignesh	github-Tobiboii	JAVA DEVELOPER
Saketh Kudupudi					Cloud Architect
Sarthak Agrawal	sarthak.agrawal.20cse@bmu.edu.in	9758214767	https://www.linkedin.com/in/sarthak-agrawal200502/	https://github.com/sarthak20cse	Web Developer
Sarthak Thakral	sarthak.thakral.20cse@bmu.edu.in	+91 9034902279		https://github.com/sarthak-thakral	Software Developer
Shashwat Dixit	shashwat.dixit.20cse@bmu.edu.in	9929595708	https://www.linkedin.com/in/shashwat-dixit-a06a7721a/	https://github.com/Shashwat23dixit	ANDROID DEVELOPMENT INTERN
Shreya	shreya.sheoran.20cse@bmu.edu.in	7814291944	https://www.linkedin.com/in/shreya-379737202/	https://www.github.com/Shreya07S	HUMAN RESOURCE MANAGER
Shubham Jha	sjha0090@gmail.com	8194016220	https://www.linkedin.com/in/shubham-jha-pythonista/	https://github.com/meShubhamJha	Full Stack Developer
Shubham Kumar	shubham.kumar.20cse@bmu.edu.in	7258097679	https://www.linkedin.com/in/shubham-k-44b41b166/	https://github.com/shubham725809	JAVA DEVELOPER
Siva Bhadra Sai Vaibhav Kedarisetti	siva.bhadrasaivaibhavkedarisetti.20cse@bmu.edu.in	-9347130614	https://www.linkedin.com/in/vaibhav-kedarisetti-a3a62420b	https://github.com/M10O	ANDROID APPLICATION DEBUGGER
Sujit Dalai	sujit.dalai.20cse@bmu.edu.in	8456882790	https://www.linkedin.com/in/sujit-dalai-036477203/	https://github.com/SujitDalai	ANDROID DEVELOPMEMT INTERN
Suvarsha Venumbaka	Suvarsha.venumbaka@gmail.com	+91 9440663098	https://www.linkedin.com/username	https://www.github.com/username	Mentee
Suyash Bagul	suyash.bagul.20cse@bmu.edu.in	8999587648	https://www.linkedin.com/in/suyashsbagul492/	https://github.com/Suyash492	Frontend Developer
Tanishq Nyati	tanishq.nyati.20cse@bmu.edu.in	9166440240	linkedin.com/in/tanishq-nyati -4b0431201	https://github.com/TanishqNyati	RESEARCH INTERN
Tanmay Rajeev Khurana	20cse@bmu.edu.in	8630755177	https://www.linkedin.com/in/tanmay-rajeev-khurana-985627234/	https://github.com/TanmayRajeevKhurana	TECHNOLOGY INTERN
Tanya Ahuja	tanya.ahuja.20cse@bmu.edu.in	8791693302	https://www.linkedin.com/in/tanya-ahuja-813051203/	https://github.com/Tanya401	Android Development Intern
Tarunsai Nippuleti	dbooster45@gmail.com	9398444269	https://www.linkedin.com/Tarun sai	https://www.github.com/db45	JAVA DEVELOPER INTERN (MANAGEMENT AND TESTING)
Tarun Tripathy	tarun.tripathy.20cse@bmu.edu.in	9508049112	https://www.linkedin.com/in/tarun-tripathy-a51586234	https://www.github.com/TarunTripathy	Intern
Twisha Khurana	twisha.khurana.20cse@bmu.edu.in	-9034121864	https://www.linkedin.com/in/twisha-khurana-6b2b40282	https://github.com/twishak	Software developer
Utsav Sharma	utsav.dhariwal@gmail.com	9530780250	https://www.linkedin.com/utsavsharma23	https://github.com/Utsav-2301	WEB DEVELOPEMENT INTERN
Vaibhav Ahuja	ahujavaibhav825@gmail.com	9416785575	https://www.linkedin.com/in/vaibhav-ahuja-65960820a/	https://github.com/vaibhav5140/	BACKEND DEVELOPER INTERN
Vaibhav Joon	vaibhav.joon.20cse@bmu.edu.in	9213119111	https://www.linkedin.com/in/vaibhav-joon-aa1985202/	https://github.com/vaibhavjoon	WEB DEVELOPER
Vansh Hooda	vansh.hooda.20cse@bmu.edu.in	7011611453	linkedin.com/in/alcophet	github.com/alcophet	Thesis
VARSHITH SAI GALI	varshithgali@gmail.com	6281617488	https://www.linkedin.com/in/varshithgali/	https://github.com/varshithgali	Junior Engagement Intern

ISSUES WHILE SHORTLISTING

1 **Using Gemini Model**

While we tested and user Gemini model for achieving the same results, we encountered a serious issue there. Each time we fed the data to Gemini, it replied with names with alphabetical orders only.

```
                          Name                        Contact Email  \
0        Rakesh Gupta Kotha        rakesh.guptakotha.20cse@bmu.edu.in
1           Rakshit Sharma                 rakshit.sharma606@gmail.com
2   Ravindhranadh Thakkellapati        ravindhranadh1969@gmail.com
3             Razina Khanam                razinakhanam06@gmail.com
4           Rishi Raj Singh                  rishiraj2954@gmail.com
5    Ruthvik Reddy Thatikonda    thatikonda.ruthvikreddy.20cse@bmu.edu.in
6             Sachin Verma            sachin.verma.20cse@bmu.edu.in
7            Sahil Kochhar              sahilkochhar323@GMAIL.COM
8        SaiEshwar Akshintala    sai.eshwarakshintala.20cse@bmu.edu.in
9        Sairamreddy Rajigiri             rsairamreddy555@gmail.com
```

ISSUES WHILE SHORTLISTING

2 Using NLP

BERT is also an NLP model, but results with NLP were different and not accurate. That was the reason we chose BERT over NLP. Cosine similarity of results was not good to be considered for shortlisting the resumes.

	Name	Contact Email	Skills - Combined	Similarity Score
20	Suvarsha Venumbaka	Suvarsha.venumbaka@gmail.com	C++ • SQL • Java • Python • CSS • HTML Python ...	0.131513
37	Vineet	vineet.20cse@bmu.edu.in	C, Python, CSS, HTML Python, C++ C, Java, SQL	0.129556
28	Utsav Sharma	utsav.dhariwal@gmail.com	C++, Java, Python, SQL, HTML, CSS C++, Python R	0.129556
52	Khushi Gupta	khushigupta27kg@gmail.com	Java, Python, C, SQL, JavaScript, HTML, CSS Ja...	0.128220
39	Yakkala Sri Praneeth	yakkala.sripraneeth.20cse@bmu.edu.in	Java, Python, SQL, HTML, CSS Python, Java, C J...	0.128220

RESULT

Resume Parsing: Accurate results achieved using BERT and NLP models.
• Candidate Matching: Effective job-candidate matching with weighted criteria for better relevance.
• Gemini vs BERT: BERT outperformed Gemini, improving context understanding and ranking accuracy.
• Candidate Ranking: Customizable ranking based on recruiter-defined priorities, enhancing decision-making.
• Security & Privacy: Data protection standards met, ensuring privacy compliance.

Simulation

CONCLUSION

- AI-powered solution streamlines recruitment.
- Automates resume parsing and job matching.
- Enhances accuracy, transparency, and efficiency.
- User-friendly interface with customizable features.
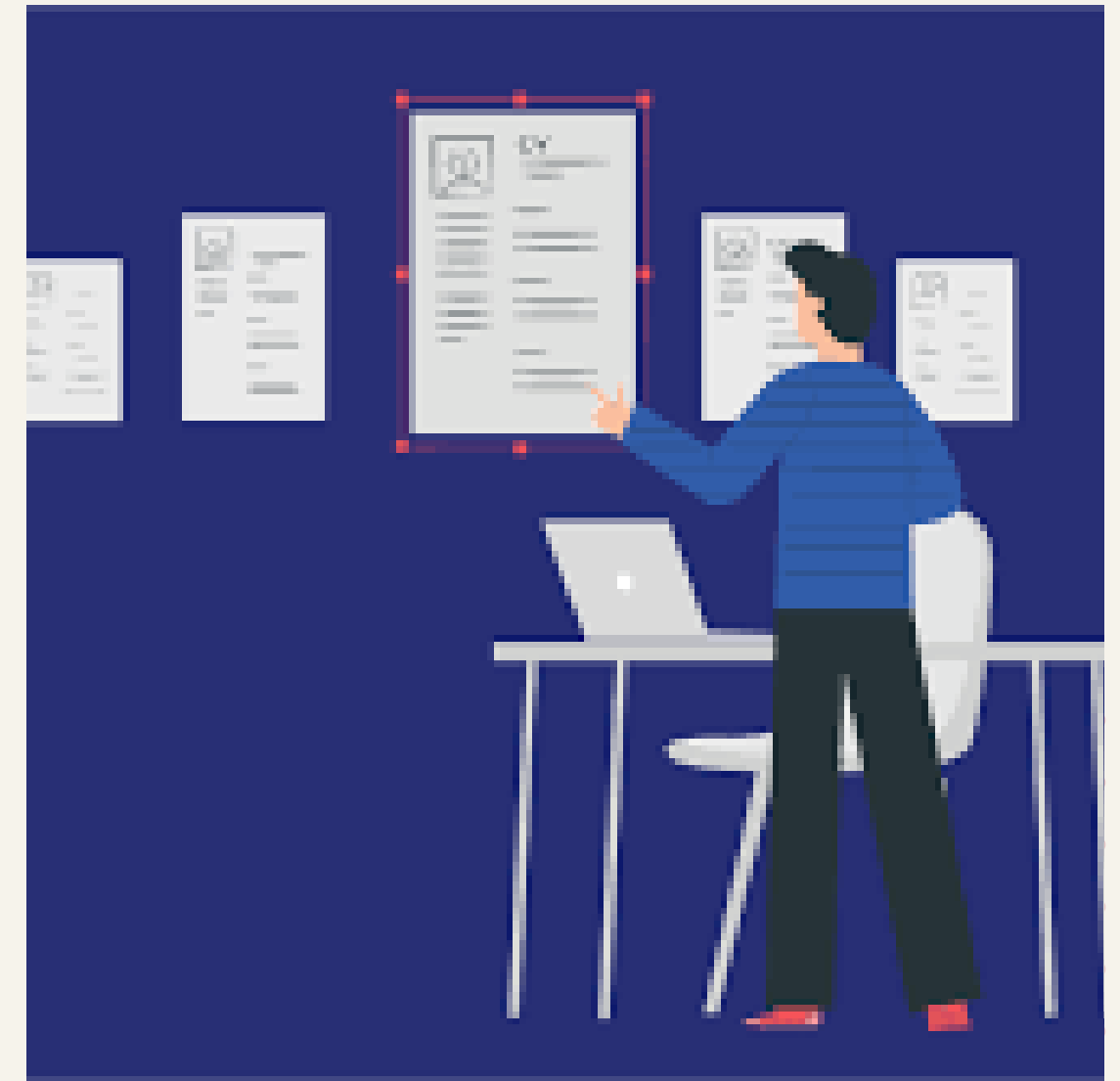
FUTURE OUTLOOK

- Multilingual Support: Expand to global audiences.
- Voice Interaction: Enable hands-free functionality.
- Behavioral Analysis: Evaluate candidates beyond technical skills.
- Cultural Fit Assessment: Align candidates with organizational values.
- Predictive Analytics: Forecast job market trends and success rates.

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THANK YOU