

# Shri Govindram Seksaria Institute Of Technology & Science Indore (M.P)

## Computer Science & Engineering **CO34999-B5**

**Names -**

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**Date of Submission –** 24-03-2025

# TaxES

Get your ITR filed



# Background

Income tax planning deals with determining ways of utilizing the income of a person to minimize the amount of tax payable. The tax laws specify the amount of tax chargeable on the income of a person. They also specify certain tax reduction mechanisms. These are in the form of rebates from tax, deductions from chargeable income and exemptions from tax for certain types of income.

The purpose of income tax planning is to reduce the tax chargeable as much as possible. This planning is done taking into consideration the available tax reduction mechanisms and the tax payer's requirements and preferences.

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# About the project

- We aim to create a tool to help Indian individuals file their tax returns.
  - Develop an intelligent tax filing system that automatically suggests the appropriate ITR form.
  - Integrate NLP to extract data from documents like salary slips.
  - Calculate the total tax payable based on user data.
  - Generate a pre-filled ITR form for the user based on the computed information.
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# Gaps Identified

- Limited use of NLP in extracting specific information like salary from unstructured salary slips.
  - Few tax tools provide auto-filled ITR forms based on complex tax rules and real-time calculations.
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# Problem Statement

*“How might we simplify and automate the process of filing income tax returns for Indian individuals by using expert systems and NLP to ensure accuracy and reduce complexity?”*

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## Already implemented solutions

### Income Tax e-filing Portal

provides access to laws and forms and has an Income Tax Calculator

### Vakil Search

Offers expert legal and compliance solutions

### MyTaxIndia

Provides tax calculation for individuals

### ClearTax

Provides tax calculation and other services

# **The type of ITR you have to fill depends on--**

## **What Type of Income you have ?**

These 5 Types of income are shown in the income Tax Act.

- **Salary**
  - **House Property**
  - **Profits from Business**
  - **Capital Gains**
  - **Other Sources**
-



**The department prescribes seven types of ITR forms based on the type of taxpayer and income:**

**ITR-1** Salary Income + House Property + Other Income (<50L)

**ITR-2** Salary + Capital Gains + Multiple House Properties

**ITR-3** Business Income, Professional Income, Trading

**ITR-4** Presumptive Taxation for Businesses & Freelancers

**ITR-5** for partnership firms, LLP, AOP and BOI. Business entities such as LLP, partnership firms, AOP and BOI can file ITR-5 for reporting income from business and profession and any other source of income.

**ITR-6** is the income tax return for companies to file income from business or profession and any other sources of income.

**ITR-7** is the income tax return for companies, associations and trusts claiming income tax exemption.

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# Which ITR will be applicable on you?

## Salaried Individuals :

### *Returns and Forms Applicable for Salaried Individuals for AY 2025-26*

#### **1. ITR-1 (SAHAJ) – Applicable only for Individual :**

This return is applicable for a Resident (other than Not Ordinarily Resident) Individual having Total Income from any of the following sources up to ₹ 50 lakh

- Salary / Pension
- One House Property
- Other sources (Interest, Family Pension, Dividend etc.)
- Agricultural Income up to ₹ 5,000

**Note:** ITR-1 cannot be used by a person who:

- Is a director in a company
- Has held unlisted equity shares during the previous year
- Owns assets or financial interests outside India
- Has signing authority in an account outside India
- Earns income from foreign sources
- Is subject to tax deduction under section 194N
- Has deferred tax payment on ESOPs
- Has brought forward or carry forward losses under any income head
- Has total income exceeding ₹50 lakh

## **2. ITR-2 - Applicable for Individual (Not eligible for ITR 1) and HUF**

This return is applicable for Individual and Hindu Undivided Family (HUF)

- Not having Income under the head Profits and Gains of Business or Profession
- Who is not eligible for filing ITR-1

## **3. ITR-3- Applicable for Individual and HUF**

This return is applicable for Individual and Hindu Undivided Family (HUF)

- Having Income under the head Profits and Gains of Business or Profession
- Who is not eligible for filing ITR-1, ITR-2 or ITR-4

## 4. ITR-4 (SUGAM) – Applicable for Individual, HUF and Firm (other than LLP)

This return is applicable for an Individual or Hindu Undivided Family (HUF), who is Resident other than Not Ordinarily Resident or a Firm (other than LLP) which is a Resident having Total Income up to ₹ 50 lakh and having income from Business or Profession which is computed on a presumptive basis (u/s 44AD / 44ADA / 44AE) and income from any of the following sources:

- Salary / Pension
- One House Property
- Other sources (Interest, Family Pension, Dividend etc.)
- Agricultural Income up to ₹ 5,000

**Note** 1: ITR-4 is not applicable to a person who:

- Is a director in a company
- Has held unlisted equity shares during the previous year
- Owns assets or financial interests outside India
- Has signing authority in an account outside India
- Earns income from foreign sources
- Has deferred tax payment on ESOPs
- Has brought forward or carry forward losses under any income head
- Has total income exceeding ₹50 lakh

## **Forms Applicable :**

**Form 12BB** – Particulars of claims by an employee for deduction of tax (u/s 192)

**Form 16** – Certificate of Tax Deducted at Source on Salary (U/s 203 of the Income Tax Act, 1961)

**Form 16A** – Certificate u/s 203 of the Income Tax Act, 1961 for TDS on Income other than Salary

**Form 67**– Statement of Income from a country or specified territory outside India and Foreign Tax Credit

**Form 26 AS** – AIS (Annual information Statement)

**Form 15G** – Declaration by resident taxpayer (not being a Company or Firm) claiming certain receipts without deduction of tax

**Form 15H** – Declaration to be made by a resident individual (who is 60 years age or more) claiming certain receipts without deduction of tax

**Form 10E** – Form for furnishing particulars of Income for claiming relief u/s 89(1) when Salary is paid in arrears or advance

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## **Investments / Payments / Incomes on which I can get tax benefit**

***Following deductions will be available to a taxpayer opting for the New Tax Regime u/s 115BAC:***

- 1. Section 24(b)**
- 2. Section 80CCD(2)**
- 3. Section 80CCH**

***Tax deductions in the Old Tax Regime :***

- **Section 24(b)**
  - **Section 80C, 80CCC, 80CCD (1)**
  - **Section 80CCD(1B)**
  - **Section 80CCD(2)**
  - **Section 80CCH**
  - **Section 80D**
  - **Section 80DD**
  - **Section 80DDB**
  - **Section 80E**
  - **Section 80EEA**
  - **Section 80EEB**
  - **Section 80G**
  - **Section 80GG**
  - **Section 80GGA**
  - **Section 80GGC**
  - **Section 80TTA**
  - **Section 80TTB**
  - **Section 80U**
-

**Business/Profession:**

- **ITR-3** – Applicable for Individual & HUF
  - **ITR-4** (SUGAM) – Applicable for Individual, HUF & Firm (Other than LLP)
- 
- **Form 16A** --- Certificate u/s 203 of the Income Tax Act, 1961 for TDS on Income other than Salary
  - **Form 26 AS** --- AIS (Annual information Statement)
  - **Form 3CB-CD**
  - **Form 15G** – Declaration by resident Taxpayer (not being a Company or Firm) claiming certain receipts without deduction of tax
  - **Form 15H** – Declaration to be made by a resident Individual (who is 60 years age or more) claiming certain receipts without deduction of tax
  - **Form 3CEB**
-

## **Senior/Super Senior Citizon**

- **ITR-1 (SAHAJ)** – Applicable only for Individual
  - **ITR-2** – Applicable for Individual (Not eligible for ITR 1) and HUF
  - **ITR-3** – Applicable for Individual & HUF
  - **ITR-4 (SUGAM)** – Applicable for Individual, HUF & Firm (Other than LLP)
- 
- **Form 16** – Details of Tax Deducted at Source on salary (Certificate u/s 203 of the Income Tax Act, 1961)
  - **Form 16A** --- Certificate u/s 203 of the Income Tax Act, 1961 for TDS on Income other than Salary
  - **Form 26 AS** --- AIS (Annual information Statement)
  - **Form 3CB-CD**
  - **Form 12BB** – Particulars of claims by an employee for deduction of tax (u/s 192)
  - **Form 15H** – Declaration to be made by a resident Individual (who is 60 years age or more) claiming certain receipts without deduction of tax
  - **Form 3CEB**
-



## Non-Resident :

- **ITR-2** - Applicable for Individual (Not eligible for ITR 1) and HUF
- **ITR-3** - Applicable for Individual & HUF

**Same All Forms (Salary Employed, Business/Profession)**

## Hindu Undivided Family (HUF) :

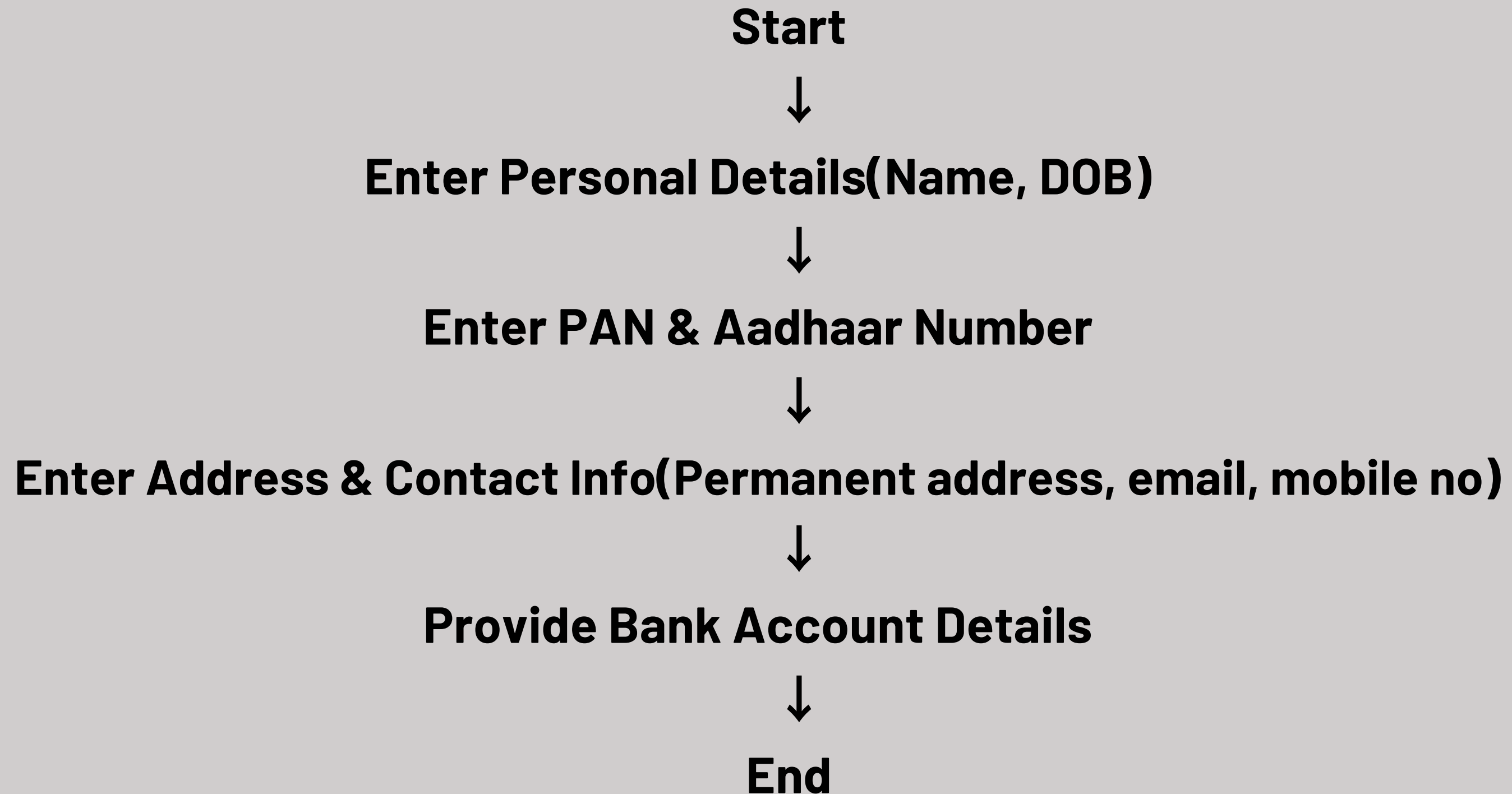
- **ITR-2** - Applicable for Individual (Not eligible for ITR 1) and HUF
- **ITR-3** - Applicable for Individual & HUF
- **ITR-4** - Applicable for Individual, HUF and Firm (other than LLP)

**Same All Forms (Salary Employed, Business/Profession)**

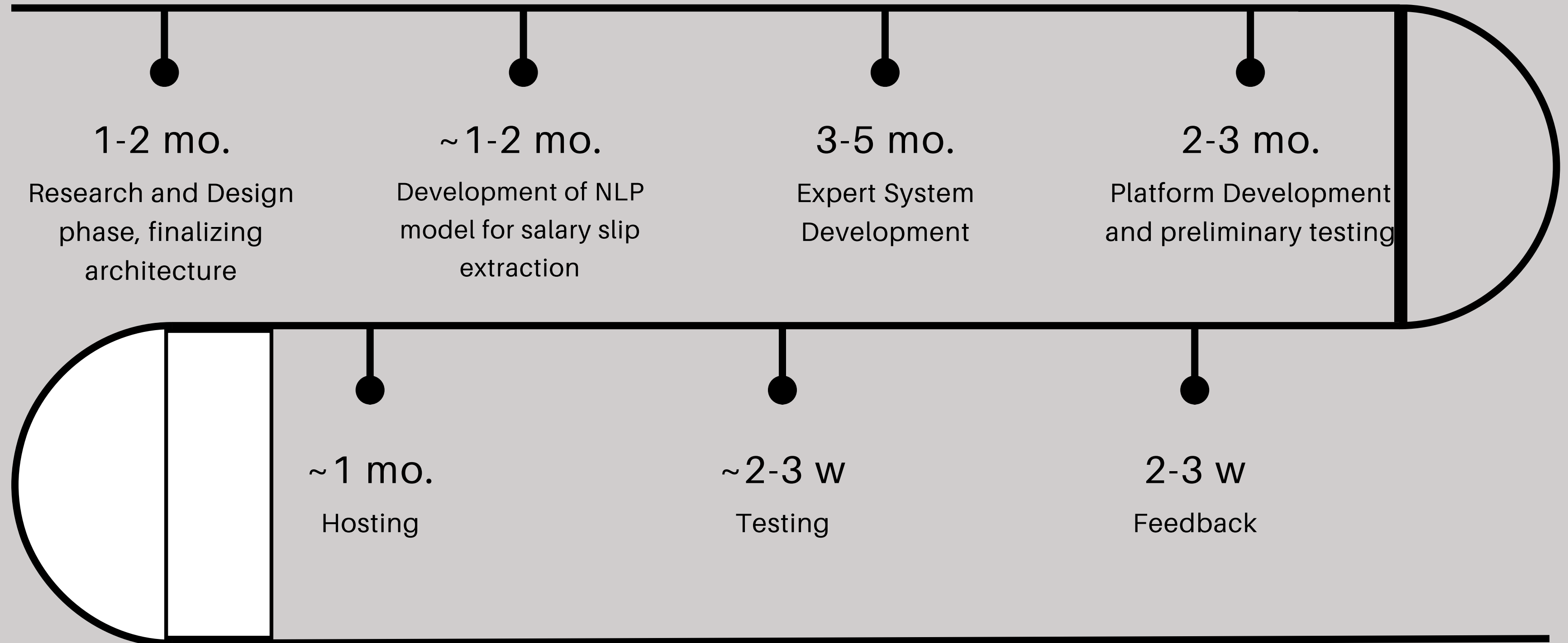
## GitHub Link :

<https://github.com/yogeshsahu0582/YSSSP/>

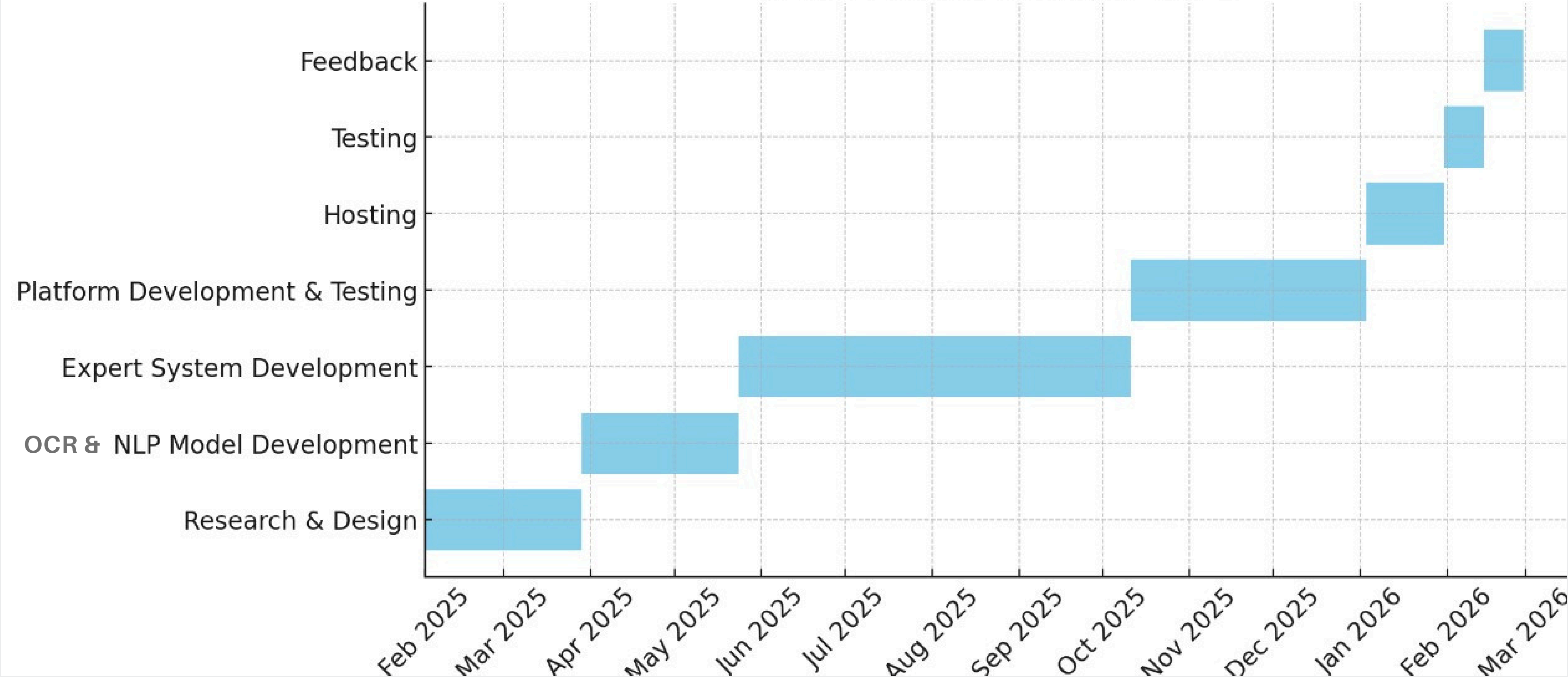
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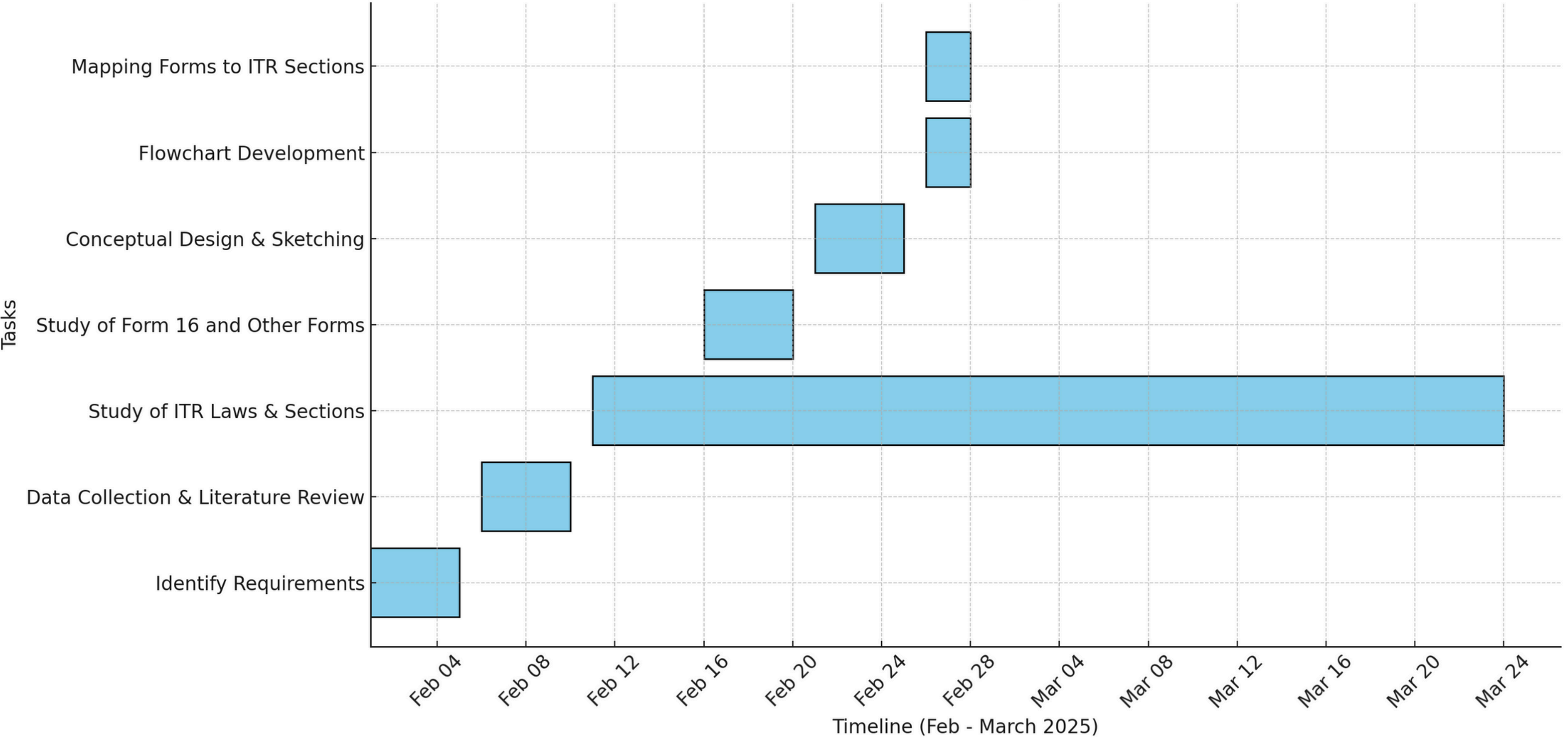
## Tentative Project Timeline



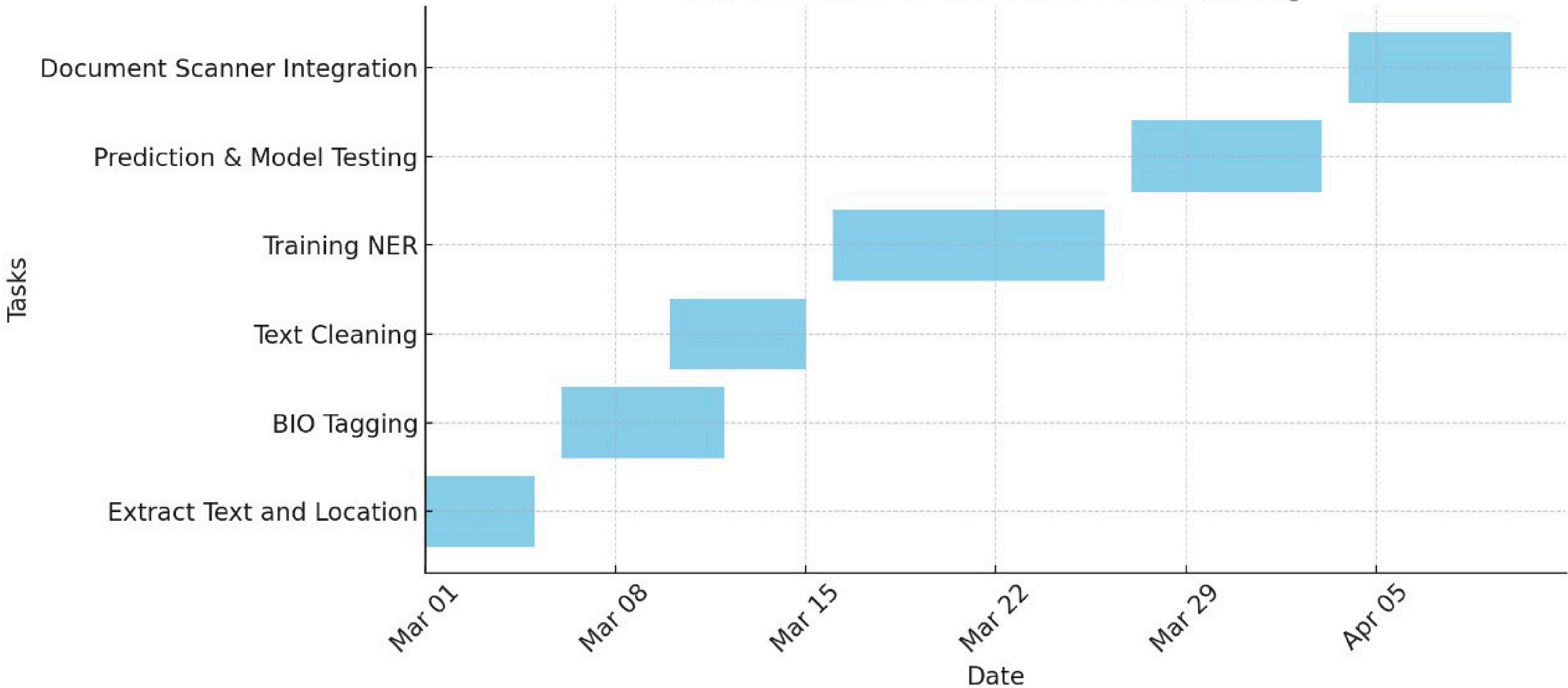
Project Gantt Chart for TaxES



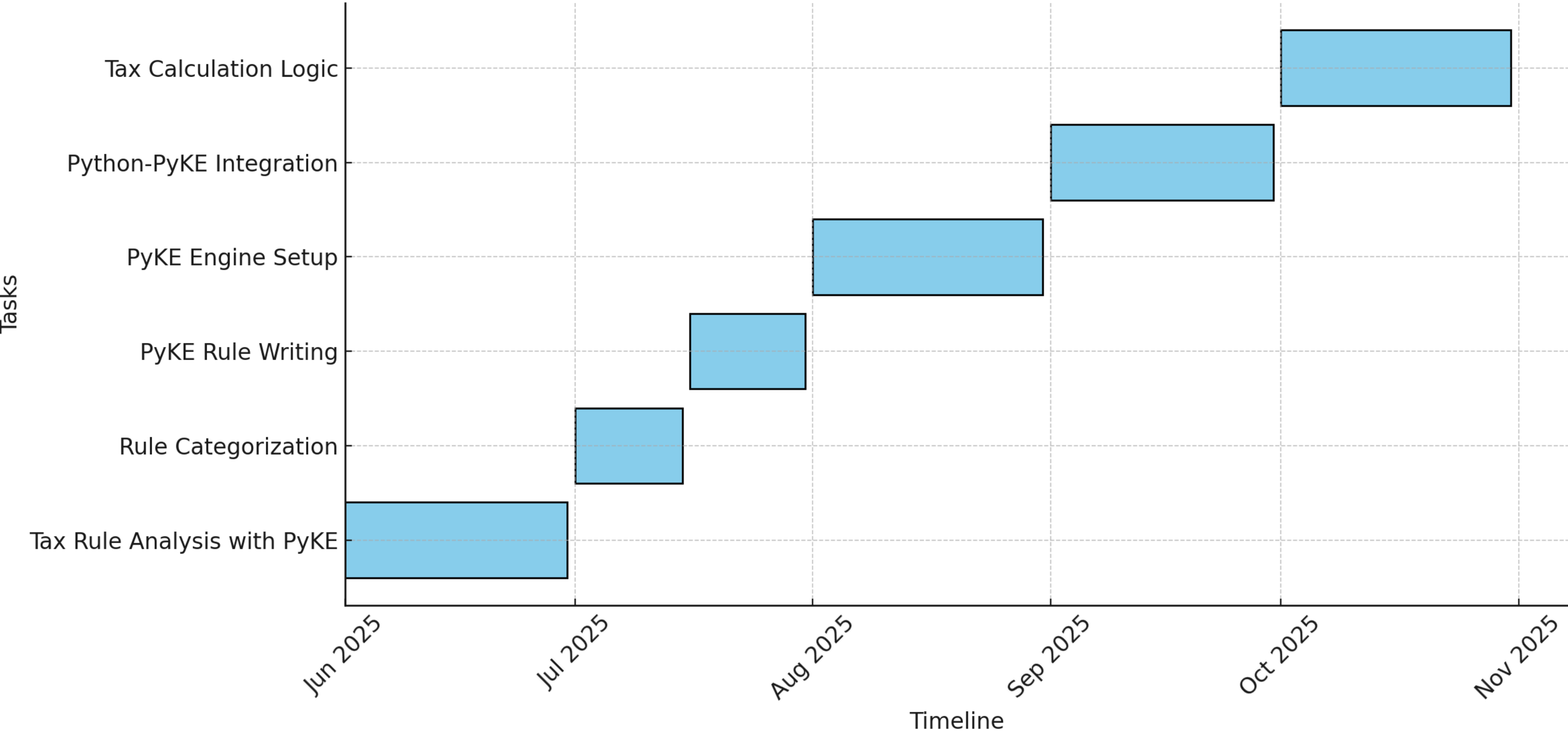
Gantt Chart - Research and Design Phase (Final Version)



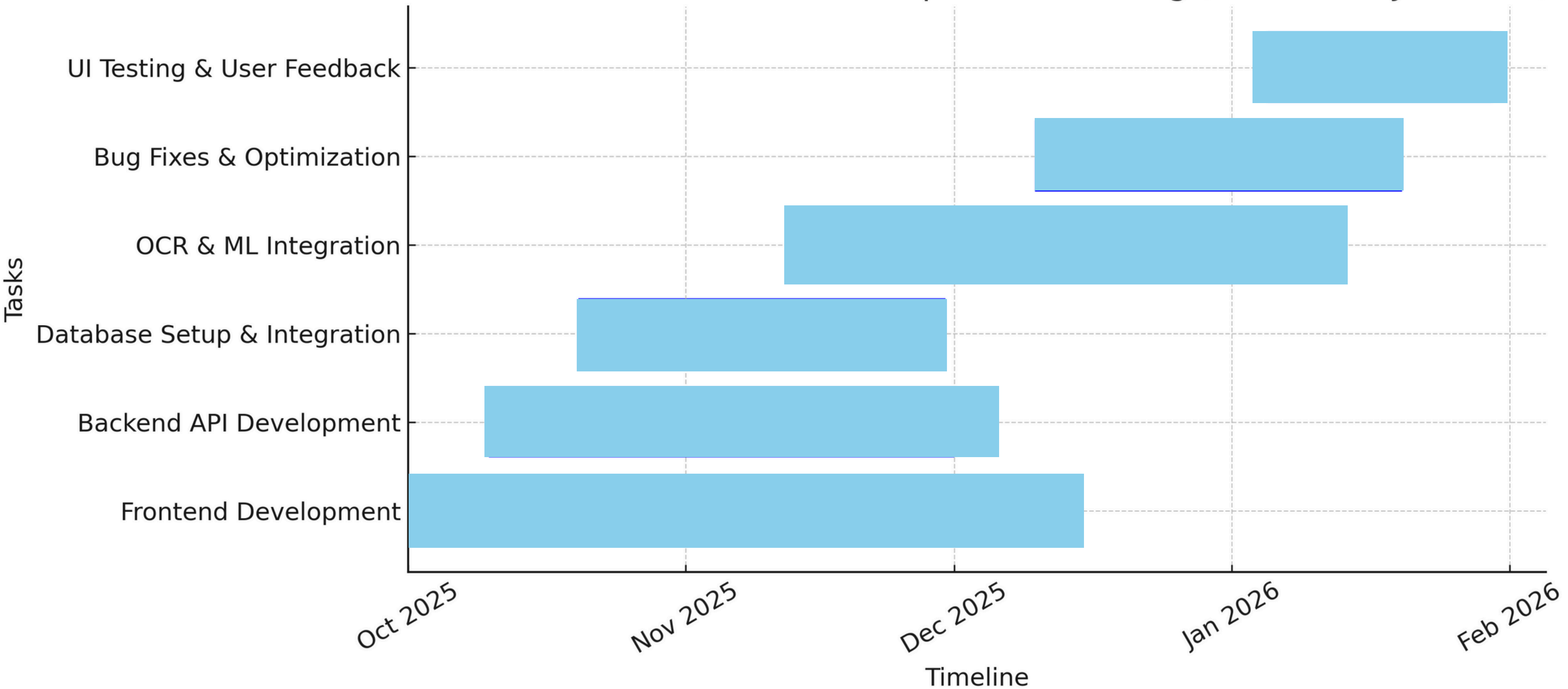
Gantt Chart for OCR and NER Training



Gantt Chart for Expert System Development (June - Oct 2025)



Gantt Chart for Platform Development & Testing (Oct 2025 - Jan 2026)





# Member Assigned For Major Project – TaxES

Module	Start Date	End	Member Assigned
Requirement Gathering & Analysis - Research & Design	Feb-25	Mar-25	Shivank Rai, Stuti Badola, Sameeksha Suryawanshi, Payal Badal
NLP Model Development & OCR	Apr-25	Jun-25	Yogesh Sahu, Shivank Rai, Stuti Badola
Expert System Development	Jul-25	Sep-25	Yogesh Sahu, Stuti Badola, Payal Badal , <b>Shivank Rai</b>
Plateform Development & Testing	Oct-25	Dec-25	Stuti Badola, Sameeksha Suryawanshi, Payal Badal
Hosting & Deployment	Jan-26	Jan-26	Shivak Rai , Yogesh Sahu
Testing	Feb-26	Feb-26	Yogesh Sahu, Shivank Rai, Stuti Badola, Sameeksha Suryawanshi, Payal Badal
Feedback	Mar-26	Mar-26	Yogesh Sahu, Shivank Rai, Stuti Badola, Sameeksha Suryawanshi, Payal Badal

**INPUT**

## Step 1-Fill in Personal Information

- ✓ Name, PAN, Aadhaar
- ✓ Address, Mobile Number
- ✓ Bank Account Details (for tax refund)

## Step 2-Enter Income Details

- 📌 Income from Salary (Form 16)
  - ✓ Employer Name, TAN
  - ✓ Gross Salary
  - ✓ Allowances & Perquisites
  - ✓ Exemptions (HRA, LTA, etc.)
  - ✓ Net Taxable Salary
- 📌 Income from House Property (if applicable)
  - ✓ Enter details if rented out (Rental Income)
  - ✓ Enter Home Loan Interest (if applicable)
- 📌 Income from Other Sources
  - ✓ Interest on Savings Account
  - ✓ Interest from Fixed Deposits
  - ✓ Dividend Income
- 📌 Exempt Income (if any)
  - ✓ Agricultural Income (up to ₹5,000)

## Step 3-Enter Deductions (Chapter VI-A)

- 📌 Deductions under Section 80C (Max ₹1.5 lakh)
  - ✓ PPF, EPF, LIC Premium, ELSS, NPS, etc.
- 📌 Other Deductions
  - ✓ 80D – Health Insurance Premium
  - ✓ 80E – Education Loan Interest
  - ✓ 80TTA – Savings Account Interest Deduction (₹10,000 max)

## Step 4-Compute Tax Liability

- ◆ The system automatically calculates:
  - ✓ Gross Total Income
  - ✓ Deductions Applied
  - ✓ Total Taxable Income
  - ✓ Tax Payable or Refundable

## **Documents uploaded can be (USE CASES):**

- **1) Form 26AS**
- **2) Form 16 (A,B,C)**
- **3) Salary pay slips**
- **4) Bank Statements**
- **5) Proof of tax saving investments**
- **6) Form 15G and 15H**
- **7) Health Insurance Premium Receipts (80D)**
- **8) Proofs of Capital Gains: like stock trading statements, Purchase/Sale deed for the sale of house property, land or building, statements from mutual funds or brokers involved**
- **9) Investment proofs claiming tax exemption: Life Insurance policy premiums, Amount invested in ELSS, EPF, PPF, NPS**
- **10) Home Loan statements issued by the lender**

## Select ITR Form: -

Salary & No Capital Gains? → **ITR-1**

Capital Gains? → **ITR-2**

Business/Professional Income? → **ITR-3**



Salary & No  
Capital Gains?

Capital Gains?

Business/Professional  
Income?

**OUTPUT**

## **1. Tax Calculation Summary:**

- **Total Taxable Income**(after deductions and exemptions)
- **Total Tax Payable**
- **Tax Already Paid** (TDS from salary slip)
- **Net Tax due or Refund Amount**

## **2. Recommended ITR form:**

- **ITR 1**
- **ITR 2**
- **ITR 3**
- **ITR 4**

## **3. Pre-filled ITR form:**

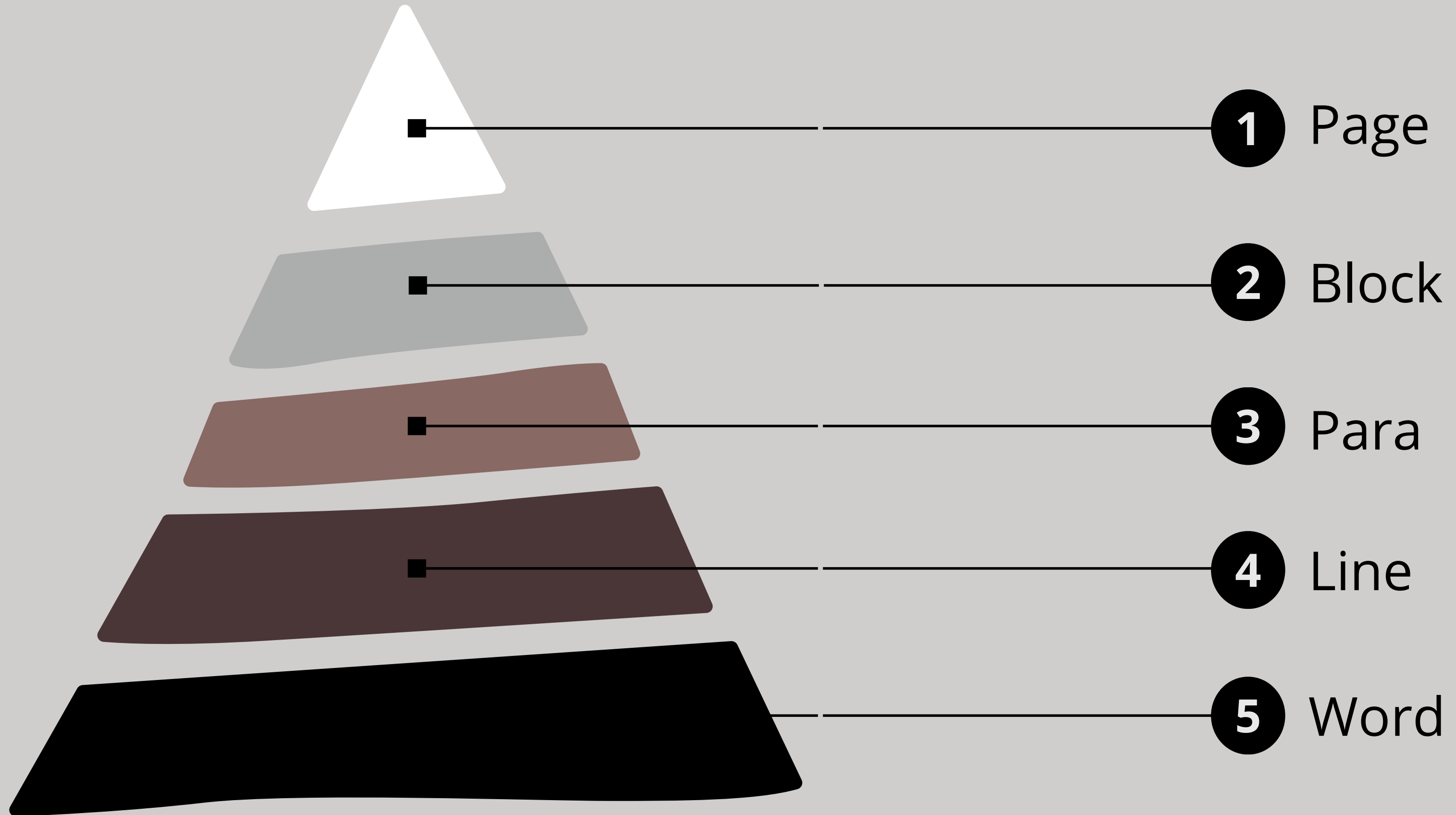
- **Personal Information**
- **Income Details**
- **Deductions and Exemptions**
- **Bank Details**
- **Verification Section**

# Library/Modules Used:

Category	Technology Used	Purpose	Key Libraries/Models
OCR (Optical Character Recognition)	Image-to-Text Conversion	Extracts text from scanned tax documents (Form 16, PAN, Aadhaar, Salary Slips).	pytesseract, openCV, EasyOCR, Keras-OCR
NER (Named Entity Recognition)	Text Extraction & Classification	Identifies key financial entities like Name, PAN, Aadhaar, Salary, Deductions.	spaCy, RegEx, pandas, pickle Hugging Face (BERT)
Expert System	Rule-Based AI & ML Models	Automates tax calculations, selects ITR type, applies deductions, and optimizes tax filing.	Custom Rules, scikit-learn (Decision Trees), Prolog, Drools (Rule-Based Systems)



# Levels



Page

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Para

FORM NO. 16				
[See rule 213(2)]				
PART A				
Certificate under section 203 of the Income tax Act, 1961 for Tax deducted at source on Salary				
Name and Address of the Employer ABC Company 911, Mahalaxmi Chambers M G Road Bangalore		Name and Designation of the Employee Employee A Senior Executive		
PAN of the Deductor	TAN of the Deductor	PAN of the Employee		
	KARACT884F	ABCCDE1234F		
CIT (TDS)		Assessment Year		
Address : No. 223, TTK Road		Period		
City : Bangalore		From To		
Pincode : 560043		2014 - 2015 1-Apr-2013 31-Mar-2014		
Summary of tax deducted at source				
Quarter	Receipt Numbers of original statements of TDS under sub-section(3) of section 200	Amount of tax deducted in respect of the employee	Amount of tax deposited / remitted in respect of the employee	
Quarter 1	1232076315	1,192.00	1,192.00	
Quarter 2				
Quarter 3				
Quarter 4				
Total		1,192.00	1,192.00	
PART B				
Details of Salary paid and any other income and tax deducted				
1. Gross Salary				
a) Salary as per Provisions contained in sec 17(1)	1,24,022.00			
b) Value of perquisites u/s 17(2) (as per Form No.12BA, wherever applicable)	44,000.00			
c) Profits in lieu of salary under section 17(3) (as per Form No. 12BA, wherever applicable)	10,000.00			
Total		1,78,022.00		
2. Less: Allowance to the Extent u/s 10				
Conveyance Allowance	800.00			
Transport Allowance	40,000.00	40,800.00		
3. Balance (1-2)				1,38,022.00
4. Deductions				
Professional Tax (Tax on Employment)	600.00			
5. Aggregate of deductions		600.00		
6. Income Chargeable under the head 'salaries' (3-5)				1,37,422.00
7. Add: Any other income reported by the employee				
Income From House Property	(-11,57,500.00)			
Income From Other Sources	1,05,000.00			
Interest on Housing Loan - Self Occupied		(-52,500.00)		
8. Gross total income (6+7)				84,922.00
9. Deductions under Chapter VI-A				
(A) Section 80C, 80CC and 80CED		15,940.00		
B Section 80C				
Employee Provident Fund (EPF)	8,903.00			
Insurance Premium	7,037.00			

FORM NO. 16				
[See rule 213(2)]				
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CIT (TDS)		Assessment Year		
Address : No. 223, TTK Road		Period		
City : Bangalore		From To		
Pincode : 560043		2014 - 2015 1-Apr-2013 31-Mar-2014		
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a) Salary as per Provisions contained in sec 17(1)	1,24,022.00			
b) Value of perquisites u/s 17(2) (as per Form No.12BA, wherever applicable)	44,000.00			
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B Section 80C				
Employee Provident Fund (EPF)	8,903.00			
Insurance Premium	7,037.00			

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# Mapping

FORM NO. 16			
[See rule 31(1)(a)]			
PART A			
Certificate under section 203 of the Income-tax Act, 1961 for Tax deducted at source on Salary			
Name and Address of the Employer ABC Company 9/1, Mahalaxmi Chambers M G Road Bangalore		Name and Designation of the Employee Employee A Senior Executive	
PAN of the Deductor	TAN of the Deductor KARA07884F	PAN of the Employee ABCDE1234F	
CIT (TDS)		Assessment Year	Period
Address : No. 223, TTK Road			From To
City : Bangalore		2014 - 2015	1-Apr-2013 31-Mar-2014
Pincode : 560043			

Name	Employee A
PAN	ABCDE1234F
Assessment Year	2014-15

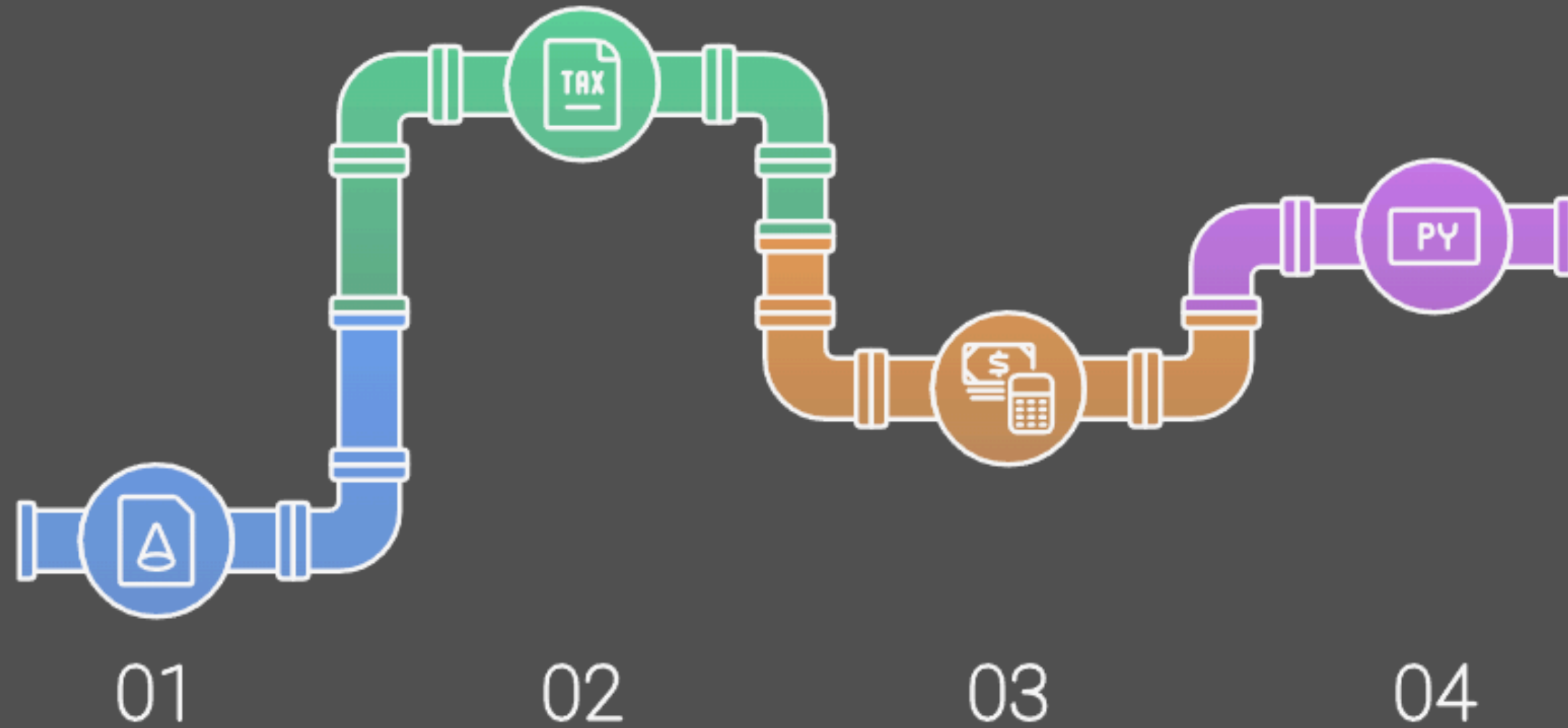
FORM NO. 16			
[See rule 31(1)(a)]			
Certificate under section 203 of the Income-tax Act, 1961 for tax deducted at source on Salary .			
Name and address of the Employer Ministry of Railways, Govt. of India, Rail Bhawan		Name, EmpNo, Bill Unit and designation of the Employee PRACHI LINCON PATRA, 50211160226, 3104026, AREA MANAGER	
PAN of the Deductor.	TAN of the Deductor. BLRS25130A	PAN of the Employee. BOZPP9837A	
CIT (TDS)		Assessment Year	Period
Address:			From To
City:	Pin Code:	2020-2021	01/APR/2019 31/MAR/2020

Name	Prachi Lincoln Patra
PAN	BOZPP9837A
Assessment Year	2020-2021

PART B			
Details of Salary paid and any other income and tax deducted			
1.	<b>Gross Salary</b>		
a)	Salary as per Provisions contained in sec.17(1)	1,24,822.00	
b)	Value of perquisites u/s 17(2) (as per Form No.12BA wherever applicable)	44,000.00	
c)	Profits in lieu of salary under section 17(3) (as per Form No.12BA, wherever applicable)	10,000.00	
	<b>Total</b>		1,78,822.00
2.	<b>Less: Allowance to the Extent u/s 10</b>		
	Conveyance Allowance	800.00	
	Transport Allowance	40,000.00	
			40,800.00
3.	<b>Balances (1-2)</b>		1,38,022.00
4.	<b>Deductions</b>		
	Professional Tax (Tax on Employment)	600.00	
5.	<b>Aggregate of deductions</b>		600.00
6.	<b>Income Chargable under the head 'salaries' (3-5)</b>		1,37,422.00
7.	<b>Add: Any other income reported by the employee</b>		
	Income From House Property	(-)1,57,500.00	
	Income From Other Sources	1,05,000.00	
	Interest on Housing Loan - Self Occupied		
			(-)52,500.00
8.	<b>Gross total income (6+7)</b>		84,922.00
9.	<b>Deductions under Chapter VIA</b>		
	<b>(A) Section 80C, 80CCC and 80CCD</b>		
	i) Section 80C		15,903.00
	Employee Provident Fund (EPF)	8,903.00	
	Insurance Premium	7,000.00	

**NER using  
spaCy**

## Development of Tax Calculation Expert System



### Define Facts

Extract and structure  
input data into PyKE  
facts

### Encode Tax Rules

Write knowledge rule  
bases for tax  
calculations

### Use Inference Engine

Apply rules  
iteratively to  
compute tax liability

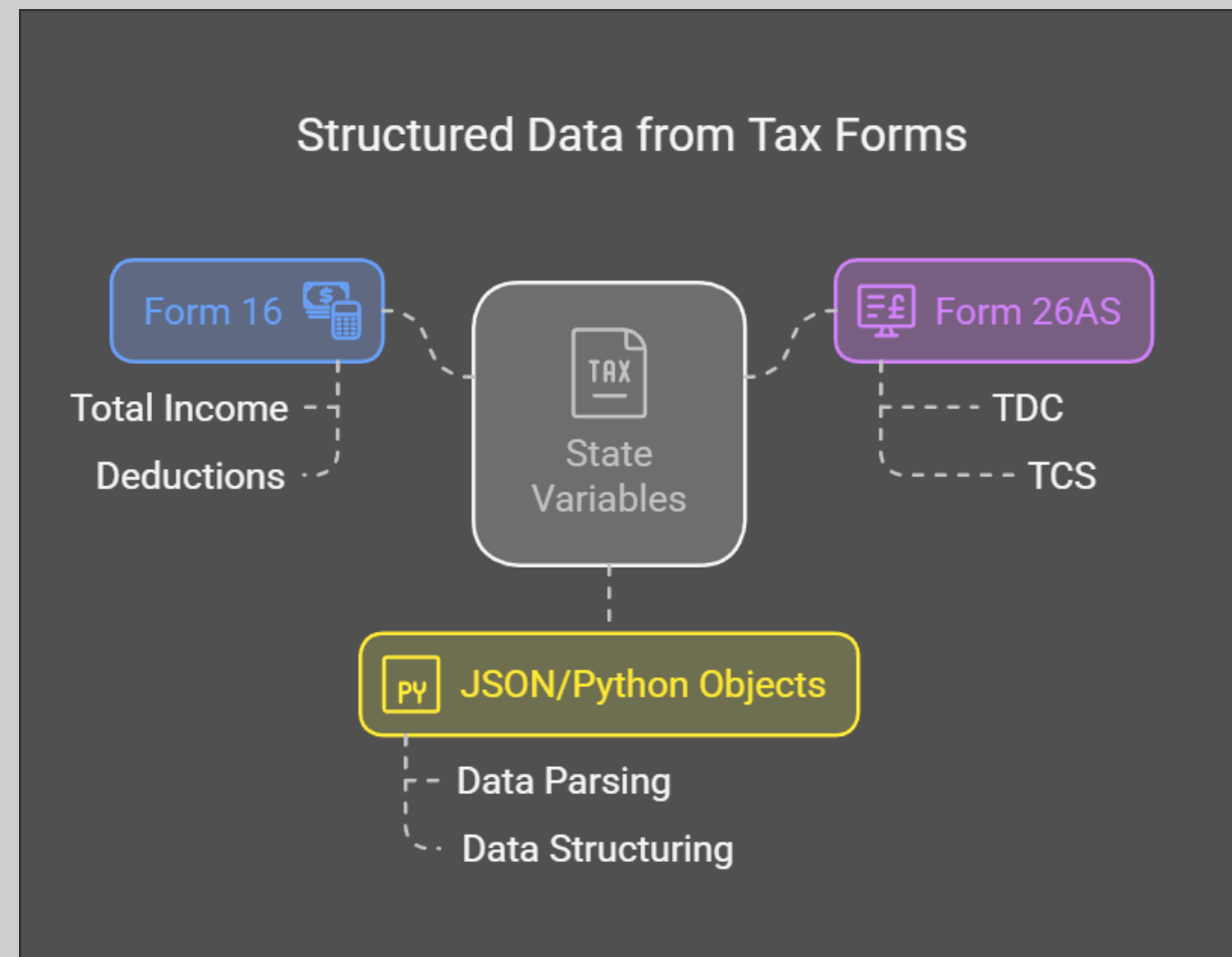
### Integration

Embed PyKE in  
Python for input and  
output processing

# Expert System: Rule Engine and Knowledge Base creation

## 1. Facts or statements:

First we will create facts/statements from the state variables (like total income, deductions, HRA allowance, etc.). These state variables will be acquired from the parsing of Form 16, Form 26AS, etc. and output as structured JSON/Python objects.



For example:-

```
Person(name, total_salary=800000)
```

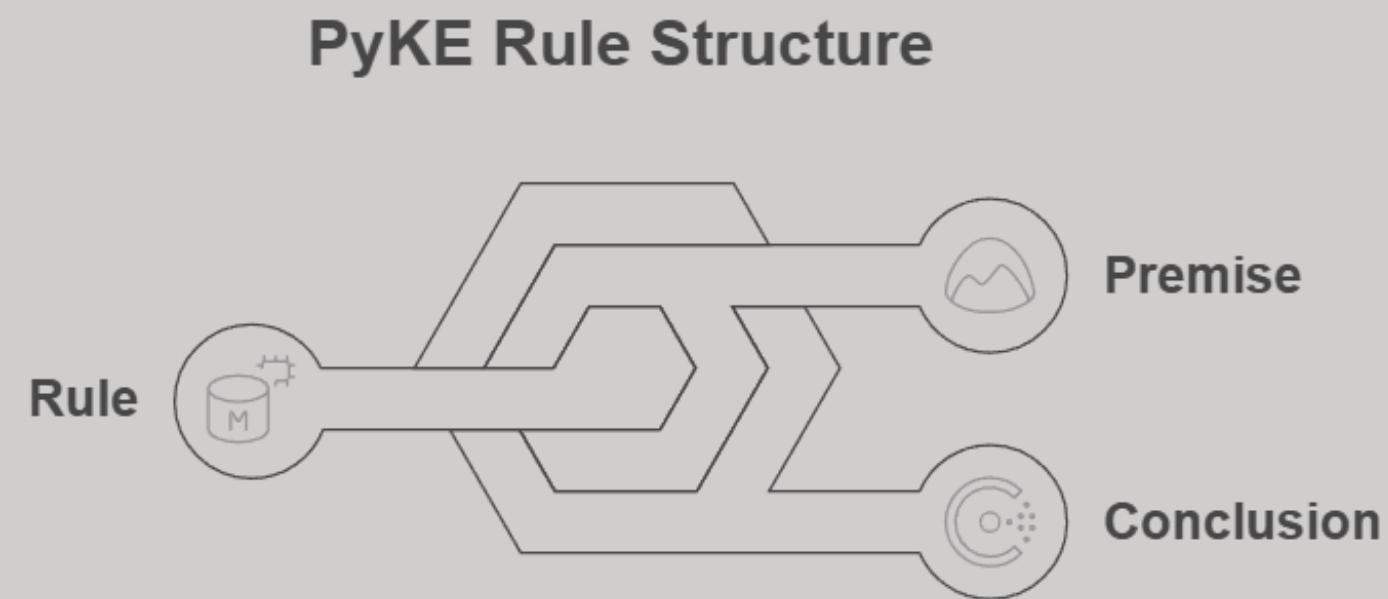


**Fact Base** stores facts in the form of (.kfb) file

# Expert System: Rule Engine and Knowledge Base creation

## 2. Rules:

Rules in PyKE define logic that can be applied to facts(or state variables), typically with an **"if-then"** structure where the "if" part is termed as **premise** and the "then" part as **conclusion**.



**For example:-**

```
# tax_slabs.krb
rule calculate_tax_slab:
    IF taxable_income($income) AND $income ≤ 700000
    THEN tax_amount(0)
```

**Unit Test:** Validate rules with sample inputs (e.g., ₹8L income with ₹1.5L 80C deduction).

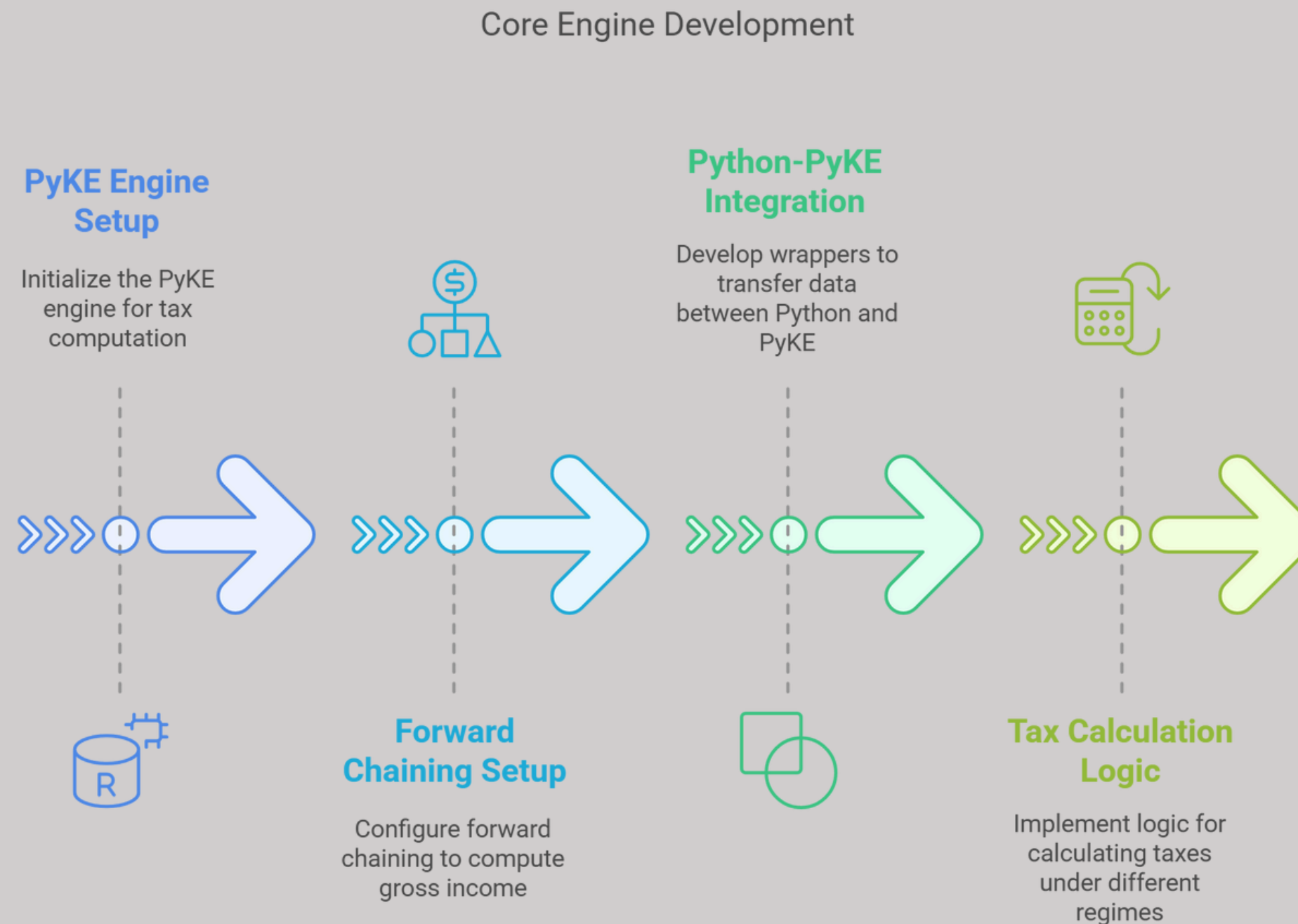
**Rule Base** stores rules in the form of (.krb) file



# Expert System: Rule Engine and Knowledge Base creation

## 3. Core Engine Development: (Inference Engine)

Build the PyKE inference engine and integrate with Python.



## Proof of Concept & Feasibility Highlights

- **Data Collection & OCR Extraction**
    - Concept: Users upload income-related documents, OCR extracts text.
    - Feasibility: Tesseract OCR, Google Vision API, AWS Textract for structured/unstructured data.
  - **Data Preprocessing & Validation**
    - Concept: Clean, format, and validate extracted data via APIs (PAN, Aadhaar).
    - Feasibility: NLP for text cleaning, government APIs for verification, cross-checking figures.
  - **AI-Based Classification & Auto-Fill**
    - Concept: ML models classify income, deductions & auto-fill ITR fields.
    - Feasibility: Supervised learning for classification, rule-based tax-saving suggestions.
  - **ITR Type Selection (Auto-Suggestion)**
    - Concept: Suggests ITR form (ITR-1 to ITR-4) based on income sources.
    - Feasibility: Decision tree logic, AI-based recommendations.
-

## Proof of Concept & Feasibility Highlights

- **Tax Calculation & Optimization**
  - Concept: Computes taxable income, applies deductions, selects the best tax regime.
  - Feasibility: Rule-based tax calculations, Old vs. New regime comparison.
  - **Filing & E-Verification**
  - Concept: Auto-fills ITR, allows review, submits electronically with e-verification.
  - Feasibility: Tax portal API/RPA automation, Aadhaar OTP, Net Banking verification.
  - **Completed ITR Filing & Acknowledgment**
  - ITR submission proof generated for records.
  - PDF acknowledgment receipt for future reference.
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# Thank you!

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