

Part B: Structural Aspects of Software (UML Diagrams)

Q1: Key Classes, Attributes, Methods, and Visibility

The table below lists the main classes used in the system along with their attributes, methods, and visibility as shown in the class diagram.

Class	Attributes	Methods	Visibility
User	- userId:int - name:String - email:String - passwordHash:String	+ register() + login() + viewAlerts() + giveFeedback() + connectEmail()	+ public / - private
Administrator	(inherits User)	+ manageUsers() + updateDetectionRules() + viewSystemLogs()	+ public
Emails	- emailId:int - sender:String - subject:String - body:String - url:String	+ fetchEmail() + parseContent()	+ public / - private
PhishingAnalyzer	- indicators:List	+ analyzeEmail() + extractIndicators()	+ public / - private
RiskScorer	- riskScore:int	+ calculateRiskScore() + classifyEmails()	+ public / - private
MitigationEngine	- actionType:String	+ quarantineEmail() + blockSender() + generateAlerts()	+ public / - private
Alert	- alertId:int - message:String - severity:String	+ sendToUser() + sendToAdmin()	+ public / - private
Feedback	- feedbackId:int - comment:String	+ storeFeedback()	+ public / - private

Q2: UML Class Diagram Relationships and Cardinality

The table below summarizes the relationships and multiplicities between classes exactly as represented in the UML class diagram.

From	To	Relationship	Label	Cardinality
Administrator	User	Inheritance	inherits	—
User	Emails	Association	connects	1 → 1..*
Emails	PhishingAnalyzer	Association	analyzed by	1 → 1
PhishingAnalyzer	RiskScorer	Composition	contains	1 → 1
RiskScorer	MitigationEngine	Dependency	uses	1 → 1
MitigationEngine	Alert	Association	creates	1 → 1..*
User	Alert	Association	receives	1 → 1..*
User	Feedback	Association	submits	1 → 1..*