

Brunel University London

NC1600 Level 1 Group Project Reassessment – Software Implementation

Assignment Title: Software Implementation

Date of Submission: 15/08/2024

Submitted To

Dr Zear Ibrahim

Associate Lecturer
Department of Computer Science at Brunel
University London

Submitted By

Name: Nafis Alam Tousim Student ID: 2249954

Introduction:

The Brunel Hospital Management System is an application in Java built for maintaining a hospital management. The implementation includes functionality for managing and manipulating reviews of healthcare professionals.

Patient feedback is inevitable in the health care system today not only for process improvement but also to allow the new patient to make the right choice of the healthcare provider. There will be a user-friendly interface through which patients can search for doctors, add reviews, and read feedback. It has an emergent user-friendly design needed for efficient health care review management. The design is made easy accordingly to ensure that all users of the system move around with ease, regardless of their technical expertise.

This report details the software implementation of the Review Management System for Doctors, which features a Java-based GUI application with Java Swing. It will explain all the met requirements, conducted testing, future work, and finally conclude by summarizing overviews of the success of the implementation. In the appendix, it will showcase source code for all the classes implemented.

Requirements Met:

- 1. This component will allow patients to provide feedback and ratings for the doctors they have visited. The GUI should support switching between different windows: **Completed.**
- 2. At the outset, this component should display average ratings and feedback for each doctor. This component should also implement a continuously running sorting mechanism that finds the highest-rated doctors and display these at the top of the average ratings: **Completed.**
- 3. After an appointment has been completed and once the medicine has been dispensed, patients will have the option to rate their experience and leave comments: **Completed.**
- 4. The doctor's information and any existing rating are to be retrieved from the review control system. New ratings and comments left by the patient or next of kin are to be attached to the doctor's records: **Completed.**
- 5. Error handling needs to be included as well as an interface that is clear and easy to use : **Completed.**

Testing:

The following tests were conducted to ensure the implementation meets the requirements. JUnit tests and manual tests through the interface were used where applicable.

Test	Component	Dı	uration	Correspondi	Pass/F	Correc
Number				ng	ail	on
				Requiremen		
				Requiremen		
				ts		
		Patient's rating	and comment should			
		_		1,3, 5	Pass N/	
1		be included to	the corresponding			
	Destan		l rating as well as			N/A
	Doctor					IN/A
	Review	comment. The	GUI switch should			
		work.				
		WOIK.				
Brunel Hospital Manager	ment System			tt Garcia,Child and Adolescent Ps urner,Urology,3.3,72,comment	ychiatry,2.9,64,comm	ent
🚇 Brunel Hosp	pital Management System		179 Dr. Layla	Wright,Endocrinology,4.1,117,com		
Kingston In, Lond	don, Uxbridge UB8 3PH, UK			Hall,Anesthesiology,2.4,37,commer pe Lopez,Pediatric Neurology,4.2,		
Home Search Docto	or Add Review			pe Lopez,Pediatric Neurology,4.2, King,Medical Toxicology,3.6,79,co		
_			183 Dr. Harper	Baker, Radiation Oncology, 2.7,53,		
Search Doctor: Da	VIS			rd,Sleep Medicine,3.4,61,comment	iommont.	
Doctor Name	Specialization	Average Rating Number of Reviews	Latest Review 186 Dr. Aurora	n Green, Dermatopathology, 2.2, 48, 6 Hill, Pediatric Orthopedics, 3.1, 5		
Dr. Zoey Davis Dr. Lauren Davis	Gynecologic Oncology 4.1 Gynecologic Oncology 4.1		Rating: 4.comment	Ross,Reproductive Endocrinology		11,comment
Dr. Jessica Davis	Neurology 4.8	9 150		Evans, Psychiatry, 1.9, 29, comment		
				ampbell, Pediatric Emergency Medic		
				urner,Internal Medicine,2.6,38,co Martinez,Neurology,3.9,94,commer		
			192			
			193 Dr. Jessic	a Davis,Neurology,4.87,151,Need t		
Dating 4			Submit Davisus			
Rating: 1			Submit Review			
	ed to co-operate		Submit Review			
	ed to co-operate		Submit Review			
_	ed to co-operate			omed Sutem		- 0
_	ed to co-operate		Stunel Hespital Manage			- 0
_	ed to co-operate		Sound Hospital Manage Remotel No.	omers System spital Management System oloo, Rushday 183 394, AX	_	- 0
_	ed to co-operate		● Brand Hospital Manage Brunci Hospital Manage Kringston In. Inc.	spital Management System ndon, textridge UBS 3PH, UK		- 0
_	ed to co-operate		Brunel Hospital Manage Rougelou In, too Home Search Doc	spital Management System ndon, kuthiday 1859 3PH, AX tor Add Review		- D
Comment: Ned			Brunel Hospital Manage Brunel Hospital Manage Roughto La, for Home Search Doctor: D. Search Doctor: D.	spital Management System does Rudoige 103 2994, 665 doft Review		- O
Comment: Ned			Brand Hospital Manage Brunct See Kongston to, too Search Doctor Tourne	Ipplial Management System Mon. Resinsign 1839 3994, AK stor Add Review Specialization Average Rate	g Number of Reviews	Latest Review
Comment: Ned Brunel Hospital Manage Brunel Hospital Manage	ement System upital Management System		Brund Hospital Manage Brund Hot Knigston In, too Home Search Dector: [0, Doctor Name Dr. Laver Dasis Dr. Laver Dasis	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Generologic Chocology 4 10 Generologic Chocology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Comment: Ned Brunel Hospital Manage	ement System		Brunci Boy Brunci III Brunci III Home Search Dector I Doctor Name Dr Zeey Daes	Spiral Manadement System More, Redolder 189 s744, MX and Review Specialization Average Ratio Gynecology: Croslogy 4 10	g Number of Reviews	Latest Review Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Kingston In, Lom	ement System pital Management System dow, Uxsbridge UBS 3PH, UK		Brund Hospital Manage Brund Hot Knigston In, too Home Search Dector: [0, Doctor Name Dr. Laver Dasis Dr. Laver Dasis	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Generologic Chocology 4 10 Generologic Chocology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Comment: Nee Brunel Hospital Manage Brunel Hospital Manage Kingston In, Lom Home Search Doctor Name	ment System pital Management System don, txsbridge ugs 3PH, UK tor Add Review Specialization	Average Rating Number of Reviews	Brunel Boy Anagton La, for Home Search Declar Doctor Insure Dr. Deg Des Dr. Latent Desig Dr. Assiss Dasis Latest Review	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Generologic Chocology 4 10 Generologic Chocology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Kingston In, Low Home Search Doctor Name Dr. Sophia Anderson	iment System ipital Management System don, txsbridge ups 3PH, UK tor Add Review Specialization Psychiatry 4.1	9 140	Brunct Ber Brunct Ber Kingsfen Lp, Ion Search Doctor Iune D. Zey Dans Dr. Laren Dans Dr. Javen Dans Dr. Javen Dans	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Generologic Chocology 4 10 Generologic Chocology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Kingston In, Lon Doctor Name Dr. Sospina Anderson Dr. Jessea Daws Dr. Stella Martinez	pital Management System aton, txthidge ups apH, ux tor Add Review Specialization Psychiatry Neurology (Child and Adolescent Psychiat)	89 140 87 151 79 142	Brunel Book Ringstow Le to Search Doctor In Doctor Name Dr. Javen Davis Dr. Javen Davi	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Generologic Chocology 4 10 Generologic Chocology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Kingston In, Low Doctor Name Dr. Sopha Anderson Dr. Jesska Daws Dr. Stella Martinez Dr. Ayesha Khan	ment System pital Management System don, txsbridge ugs sPH, ux tor Add Review Specialization Psychiatry 4.1 Neurology 4.1	99 140 97 151 79 142 79 142	Brunel Bot Rougine Is, for Kongrine Is, for Rougine Is	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Generologic Chocology 4 10 Generologic Chocology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Kingston In, Low Home Search Doctor Name Dr. Sophia Anderson Dr. Jessela Davis Dr. Stella Martinez Dr. Raybel Martinez Dr. Roybel Martinez Dr. Roybel Martinez Dr. Olivia Brown	ment System pital Management System don, txdridge ugs 3PH, ux tor Add Review Specialization Psychiatry 4. Neurology 4. Child and Adolescent Psychiat, 4. Child and Adolescent Psychiat, 4. Child and Adolescent Psychiat, 4. Pediatrics	140 177 151 179 142 199 142 199 140 199 140	Brunel Biogram Minago Brunel Biogram A, Jose Search Doctor In Doctor Name Dr. Laren Daris Dr.	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Generologic Chocology 4 10 Generologic Chocology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Kingston In, Low Home Search Doctor Name Dr. Sophia Anderson Dr. Jessea Davis Dr. Algesha Khan Dr. Rachel Martinez Dr. Alyesha Khan Dr. Tankie Wilson	iment System Difal Management System don, txshridge UBS 3PH, UK Specialization Psychiatry Neurology (Child and Adolescent Psychiat, 4) Child and Adolescent Psychiat, 4 Child and Adolescent Psychi	140 177 1515 151 179 179 1742 179 1742 179 1742 179 1740 179 179 179 170	Brunct Ber Rings to Latest Review Rating: 4 comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Kingston Iza, Lon Doctor Name Dr. Sopha Anderson Dr. Sapha Anderson Dr. Alesha Marinez Dr. Alesha Wan Dr. Rachel Martinez Dr. Oliva Brown Dr. Amad Hassan Dr. Ahmad Hassan	iment System pital Management System don, txdridge ugs 3PH, ux tor Add Review Specialization Psychiatry 4. Ohld and Adolescent Psychiat. 4. Child and		Brunel Boy Roughou La, for Roughou La, for Roughou La, for Roughou La, for Color Ducker Hame D. Zeep Dans D. Laren Dans D. Assissa Dans D. Assissa Dans D. Assissa Dans Rating 4, Comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Kingston Ize, Low Doctor Name Dr. Sophia Anderson Dr. Sascha Martinez Dr. Ayesha Khan Dr. Rachel Martinez Dr. Armad Hassan Dr. Armad Hassan Dr. Armad Hassan Dr. Ji-hoon Kim Dr. Ji-hoon Kim Dr. Ji-hoon Kim Dr. Ji-hoon Kim	ment System pital Management System don, txdridge UBs 3PH, UK tor Add Review Specialization Psychiatry 4. Child and Adolescent Psychiat. 4. Pediatrics 9. Cardiology 4. Obstetrics and Gynecology 4. Physical Medicine and Rehabili 4.		Brunel Boy Acade Latest Review Rating 4 comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Kingston In, Low Doctor Name Dr. Sosphia Anderson Dr. Jesseka Davis Dr. Jesseka Davi	pital Management System pital Management System don, txthridge ttps 3PH, ttx tor Add Review Specialization Psychiatry 4. Neurology 4. Child and Adolescent Psychiat, 4. Pediatrics 4. Cardiology 6. Cardiology 7. Cardiology 8. Cardiology 9. Cardiology		Brunel Biological Manage Register Latest Review Rating 4 Comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Brunel Illos Kingston In, Low Home Search Doctor Name Dr. Sophsa Anderson Dr. Jesses Davis Dr. Jesses Davis Dr. Jesses Lawis Dr. Johnson Dr. Athley Wilson Dr. Athley Wilson Dr. Athley Millon Dr. Jahoon Kim Dr. Jahon Kim Dr. Jahon Faylor Dr. Samuel Taylor Dr. Samuel Taylor Dr. Samuel Taylor Dr. Farny Turner Dr. Mel Tan	pital Management System pital Management System don, txthridge ttps 3PH, ttx tor Add Review Specialization Psychiatry 4. Neurology 4. Child and Adolescent Psychiat, 4. Pediatrics 4. Cardiothory 4. Obstetrics and Gynecology 4. Physical Medicine and Rehabili 4. Physical Medicine and Rehabili 4. Physical Medicine and Rehabili 4. Cardiothoracic Surgery 4. Cardiothoracic Surgery 4. Cardiothoracic Surgery 4.	140	Latest Review Rating 1, Keep to cooperate Rating 1, Comment Rating 4, Comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manages Brunel Hospital Manages Brunel Hospital Manages Kingston In, Ione Doctor Name Dr. Sopha Anderson Dr. Sashel Martinez Dr. Alsel Martinez	ment System pital Management System don, kxdridge UBS 3PH, UK tor Add Review Specialization Psychiatry 4. Child and Adolescent Psychiat, 4. Cardiology 4. Cardiology 4. Cardiology 4. Cardiology 4. Cardiology 4. Physical Medicine and Rehabili 4. Cardiologoracies Surgery 1.		Raling 4 comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Kingston In, Lone Doctor Name Dr. Sopha Anderson Dr. Sopha Anderson Dr. Ashed Martinez Dr. Alshed Martinez Dr. Jahon Kim Dr. Lism Taylor Dr. Samuel Taylor Dr. Samuel Taylor Dr. Martinez Dr. Mertinez Dr. Mertinez Dr. Mertinez Dr. Kimberly Adams Dr. Bergamm Taylor Dr. Khadaji Rathman	ment System pital Management System don, txdridge ttps apH, ttx tor Add Review Specialization Psychiatry 4 Neurology 4 Child and Adolescent Psychiat, 4 Physical Medicine and Rehabil, 4 Physical Medicine and Rehabil, 4 Physical Medicine and Rehabil, 4 Cardiothoracic Surgery 4 Neonatology 4 Internal Medicine Pediatric Infectious Diseases 4 Pediatric Infectious Diseases 4		Rating 4 comment Rating	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Kingston fo, Low Home Search Doct Doctor Name Dr. Sopha Anderson Or. Sachel Martinez Dr. Ashed Martinez Dr. Ander Mana Dr. Samuel Taylor Dr. Emily Turner Dr. Man Ean Dr. Kamberly Adams Dr. Bengamm Taylor Dr. Kimberly Adams Dr. Bengamm Taylor Dr. Kimberly Adams Dr. Bengamm Taylor Dr. Kings Singh Dr. Manage Singh Dr. Manage Singh Dr. Manage Singh Dr. Manage Singh	ment System pital Management System don, txdridge Ups 3PH, UX tor Add Review Specialization Psychiatry 4. Neurology Ginid and Adolescent Psychiat, 4. Child and Adolescent Psychiat, 4. Cardiology 4. Physical Medicine and Rehabili 4. Physical		Brund Hoopital Minage Brund Search Doctor Name Chapter & Latest Review Rating: 4.comment Rating: 1.Meed to co-operate Rating: 4.comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Comment: Nee Grunel Hospitel Manage Brunel Hospitel Manage Brunel Hospitel Manage Kingston Lo, Low Home Search Doct Doctor Name Dr. Sopha Anderson Dr. Jessica Davis Dr. Ander Martinez Dr. Ander Hospitel Dr. Manad Hassam Dr. Jesnon Kim Dr. Liam Taylor Dr. Kamedy Adams Dr. Bengamin Taylor Dr. Kindely Adams Dr. Bengamin Taylor Dr. Michael Carter Dr. Michael Carter Michael Carter	pital Management System pital Management System don, txdridge UBs 3PH, UX tor Add Review Specialization Psychiatry 4. Child and Adolescent Psychiat, 4. Physical Medicine and Rehabili 4. Physical Medicine and Rehabili 4. Physical Medicine and Rehabili 4. Cardiothoracis Surgery 4. Internal Medicine 4. Pediatric Infectious Diseases 4. Pediatric Infectious Diseases 5. Pediatric Infectious Diseases 8. Pediatric Infectious Diseases 8. Pediatric Infectious Diseases 8.		Brunel Bot Rougho La, for Rougho La, for Rougho La, for Rating 4. Comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Comment: Nee Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Fr. Sopha Anderson Doctor Name Docto	Intent System Ipifal Management System Add Review Specialization Psychiatry All Child and Adolescent Psychiat, 4 Pripsical Medicine and Rehabili 4 Physical Medicine and Rehabili 4 Physical Medicine and Rehabili 4 Physical Medicine and Rehabili 4 Pripsical Medicine and Rehabili 4 Pr	140 140 140 147 151 140 147 151 142 142 142 142 142 142 142 144	Brunel India Brunel India Roughou La, for Roughou La,	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Dr. Sopha Anderson Dr. Jessica Davis Dr. Agesta Davis Dr. Managesta Davi	Internal Medicine and Rehabili 4. Pediatric Infectious Diseases 4.		Latest Review Rating, 1, comment Rating, 4, comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Brunel Hospital Manage Brunel Hospital Kingston Ln, Low Home Saarch Doct Doctor Name Dr. Sephia Anderson Dr. Jessica Davis Dr. Jessica Davis Dr. Sephia Nian Dr. Sephia Nian Dr. Jessica Brune Dr. Carbin Johnson Dr. Ashoon Kim Dr. Lam Johnson Dr. Jahoon Kim Dr. Brunel Hospital Dr. Manage Dr. Manage Dr. Manage Dr. Manage Dr. Manage Dr. Michelle Carter Dr.	Intent System Interest Specialization Psychiatry Add Review Specialization Psychiatry 4. Neurology 4. Neurology 4. Child and Adolescent Psychiat. 4. Child and Adolescent Psychiat. 4. Child and Adolescent Psychiat. 4. Pediatric Sand Gynecology 4. Obstetrics and Gynecology 4. Cardiology 6. Cardiology 6. Cardiology 7. Cardiology 8. Cardiology 9. Cardiology 9. Cardiology 9. Internal Medicine and Rehabili 4. Physical Medicine and Rehabili 4. Physical Medicine and Rehabili 4. Physical Medicine and Rehabili 4. Prissical Medicine and Rehabil		Latest Review Rating 4 comment Rating 1 comment Rating 4 comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment
Comment: Nee Brunel Hospital Manage Brunel Hospital Manage Brunel Hospital Manage Kingston In, Ion Home Search Doctor Name Dr. Sopha Anderson Dr. Hossian Davis Dr. Albert Martinez Dr. Albert Martinez Dr. Albert Martinez Dr. Arbert Martinez Dr. Home Tan Dr. Kindelin Alarham Dr. Sangy Singh Dr. Machele Garter Dr. Machele Gart	ment System pital Management System don, txchidge UBs 3PH, UK tor Add Review Specialization Psychiatry All Neurology All Child and Adolescent Psychiat. 4 Cardiology 4 Cardiology 4 Cardiology 4 Cardiothoracia Medicine and Rehabili 4 Physical Medicine and Rehabil	140	Brunel Ide Rouge La feet Review Rating 4 comment	Ipplial Management System Mon, Radnidge 1839 399, AX ton Add Review Specialization Average Rate Genecology Chroology 4 10 Genecology Chroology 4 10	g Number of Reviews 112 110	Latest Review Rating: 4,comment Rating: 4,comment

2	Doctor Review	feedback fo	lay average ra or each doctors or the doctors order with re average	or. Also,	2,4,5	Pass	N/A
		New ratings	are listed acc	ordingly			
		using					
		EventOuelle	invokeLater(sh	owDoct			
		~	`				
		orReviews).	This ensures	thread			
		security as v	well as to avoi	id issues			
		_					
		like inconsi	stent UI beha	avior or			
		crashing.					
		ton In, London, Uxbridge UB8 3PH, U	IK .				
		earch Doctor Add Review					
		or Name Specialization		Number of Reviews	Latest Review		
	Dr. Sophia An	or Name Specialization	on Average Rating 4.89 4.87	140	Rating: 4,comment		
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar	or Name Specialization Iderson Psychiatry avis Neurology tinez Child and Adolescen	4.89 4.87 t Psychiat. 4.79	140 151 142	Rating: 4,comment Rating: 1,Need to co-operate Rating: 4,comment		
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Kl	or Name Specializati derson Psychiatry avis Neurology tinez Child and Adolescen han Child and Adolescen	4.89 4.87 t Psychiat. 4.79 t Psychiat. 4.79	140 151 142 142	Rating: 4,comment Rating: 1,Need to co-operate Rating: 4,comment Rating: 4,comment	4	
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Kl Dr. Rachel M Dr. Olivia Bro	or Name Specializati derson Psychiatry avis Neurology tinez Child and Adolescen han Child and Adolescen artinez Child and Adolescen wm Pediatrics	4.89 4.87 t Psychiat 4.79 t Psychiat 4.79 t Psychiat 4.79 4.79	140 151 142 142 140 130	Rating: 4,comment Rating: 1,Need to co-operate Rating: 4,comment Rating: 4,comment Rating: 4,comment Rating: 4,comment	=	
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel Mi Dr. Olivia Bro Dr. Emily Joh	or Name Specializativ derson Psychiatry awis Neurology tinez Child and Adolescen an Child and Adolescen atinez Child and Adolescen very Pediatrics sson Cardiology	4.89 4.87 t Psychiat, 4.79 t Psychiat, 4.79 t Psychiat, 4.79 4.79 4.79	140 151 142 142 140 130	Rating: 4,comment Rating: 1,Need to co-operate Rating: 4,comment Rating: 4,comment Rating: 4,comment Rating: 4,comment Rating: 4,comment Rating: 4,comment	4	
	Dr. Sophia Ar Dr. Jessica D Dr. Stella M Dr. Ayesha KI Dr. Rachel M Dr. Olivia Bro Dr. Emily Joh Dr. Ashley W Dr. Ahmad H	or Name Specializati derson Psychiatry avis Neurology tinez Child and Adolescent han Child and Adolescent ratinez Child and Adolescent win Pediatrics son Cardiology Ison Obstetrics and Gyne Sessen Psysical Medicine an	4.89 4.87 t Psychiat 4.79 t Psychiat 4.79 t Psychiat 4.79 4.79 cology 4.69 dd Rehabill 4.69	140 151 142 142 140 130 120 110	Rating: 4.comment Rating: 1.Need to co-operate Rating: 4.comment		
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Kl Dr. Rachel M. Dr. Olivia Bro Dr. Emily Joh Dr. Ashtey W. Dr. Ahmad H.	or Name Specializati derson Psychiatry avis Neurology tinez Child and Adolescen nam Child and Adolescen ritnez Child and Adolescen ritnez Child and Adolescen wm Pediatrics nson Cardiology Ison Obstetrics and Gyne sssan Physical Medicine ar m Physical Medicine ar	4 89 4 87 1 Psychiat 4 79 1 Psychiat 4 79 1 Psychiat 4 79 4 79 4 79 4 79 4 79 4 6 Petaboli 4 69 4 6 Petaboli 4 69	140 151 151 142 142 140 130 120 110 103	Rating: 4.comment Rating: 1.Need to co-operate Rating: 4.comment		
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Kl Dr. Rachel Mr. Dr. Olivia Bro Dr. Emily Joh Dr. Ashley W Dr. Ahmad Hi Dr. Ji-hoon Ki Dr. Liam Tayl Dr. Samuel T	or Name Specializati derson Psychiatry awis Neurology linez Child and Adolescen nam Child and Adolescen ritinez Child and Adolescen vm Pediatrics rison Cardiology lson Obstetrics and Gym m Physical Medicine ar m Physical Medicine ar or Physical Medicine ar eylor Physical Medicine ar	4.89 4.87 1 Psychiat 4.79 1 Psychiat 4.79 1 Psychiat 4.79 4.79 4.79 4.79 4.60 4.6	140 151 151 142 142 140 130 120 110 103 103 103 103	Rating 4.comment Rating 1,Need to co-operate Rating 4.comment		
	Dr. Sophia Ar Dr. Jessica Da Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel Mi Dr. Olivia Bro Dr. Emily Joh Dr. Ashley W Dr. Ahmad Hi Dr. Ji-Inon Ki Dr. Liam Tayl Dr. Samuel T Dr. Emily Tun	or Name Specializati derson Psychiatry avis Neurology tinez Child and Adolescen ann Child and Adolescen artinez Child and Adolescen artinez Child and Adolescen artinez Child and Adolescen win Pedatitrics rison Cardiology Ison Obstetrics and Gyme Sison Obstetrics and Gyme Physical Medicine ar m Physical Medicine ar paylor Physical Medicine ar aylor Physical Medicine ar ner Cardiothracis Cardiothracis Learner	4.89	140 151 142 142 140 130 120 110 103 103 100 100 127	Rating 4 comment Rating 1 Need to co-operate Rating 4 comment Rating 8 comment		
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel M. Dr. Olivia Bro Dr. Emily Joh Dr. Ashley W. Dr. Ahmad H. Dr. J-honon K. Dr. Liam Tayl Dr. Samuel T Dr. Emily Tun Dr. Mei Tan	or Name Specializati derson Psychiatry avis Neurology tinez Child and Adolescen nam Child and Adolescen ratinez Child and Adolescen ratinez Child and Adolescen ratinez Child and Adolescen wm Pediatrics neson Cardiology Ison Obstetrics and Gyne sissan Physical Medicine an or Physical Medicine an or Physical Medicine an erer Cardiothoracic Surge Cardiothoracic Surge dams	4 89 4 87 1 Psychiat 1 479 1 Psychiat 1 479 1 Psychiat 1 479 1 Psychiat 1 479 4 79 4 79 4 79 4 79 4 79 4 79 4 79	1440 1551 142 142 142 140 130 120 110 103 103 103 103 103 127 127 127	Rating 4 comment Rating 1 Need to co-operate Rating 4 comment		
	Or. Sophia Ar Dr. Sessica D Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel M. Dr. Olivia Bro Or. Emily Joh Dr. Ashley W. Dr. Ahnel H. Dr. Ji-hoon Ki Dr. Limon Ki Dr. Emily Tun Dr. Mei Tan Dr. Kimbery J. Dr. Benjamin	or Name Specializati derson Psychiatry awis Neurology tinez Child and Adolescen ran Child and Adolescen rinez Child and Adolescen rinez Child and Adolescen rinez Child and Adolescen wn Pediatrics son Cardiology Ison Obstetrics and Gyne sssan Physical Medicine an m Physical Medicine an aylor Physical Medicine ar ere Cardiolhoracic Surge Adams Neonatology Internal Medicine Internal Medicine Internal Medicine	4.89 4.87 1.75	140 151 142 142 142 140 130 120 110 103 103 103 100 127 127 127 120	Rating 4.comment Rating 1.Need to co-operate Rating 4.comment		
	Or. Sophia Ar Dr. Sessica D Dr. Stella Mar Dr. Ayesha Ki Dr. Racha Ki Dr. Racha Ki Dr. Racha Ki Dr. Racha Ki Dr. Clivia Bro Or. Emily Joh Or. Ashley W Dr. Ahmad Ki Dr. Ji-hoon Ki Dr. Limm Tayl Dr. Samuel T Dr. Emily Tun Dr. Mei Tan Dr. Kimberly Dr. Rengamin Dr. Khadija R Dr. Sanjay Si	or Name Specializati derson Psychiatry awis Neurology tinez Child and Adolescen ham Child and Adolescen ratinez Child and Adolescen win Pediatrics Son Gardiology Ison Obstetrics and Gyne Sasan Physical Medicine an m Physical Medicine an m Physical Medicine an physical Medicine an physical Medicine an cardiothoracic Surge Addams Neonatology Taylor Internal Medicine Internal Medicine Pediatric Infectious E Pediatric Infectious E physical Medicine Pediatric Internal Medicine Pediatric Internal Medicine Pediatric Infectious E physical Medicine Pediatric Interclous E Pediatric Infectious E Pediatric Infectious E Pediatric Infectious E	4 89 4 87 1 Psychiat 4 79 1 Psychiat 4 79 1 Psychiat 4 79 1 Psychiat 4 79 4 79 4 79 4 79 4 79 6 19 6 19 6 19 6 19 6 19 6 19 6 19 6 1	1440 1551 142 142 142 1430 130 120 110 103 103 103 103 100 127 127 127 120 100 135 135 135	Rating 4 comment Rating 5 Need to e-o-perale Rating 1 Need to e-o-perale Rating 4 comment		
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel Mi Dr. Olivia Bro Dr. Emily Joh Dr. Ashley Wi Dr. Almad Hi Dr. Ji-hon Ki Dr. Liam Tayl Dr. Samuel T Dr. Emily Tun Dr. Memberly I Dr. Kimberly I Dr. Kimberly I Dr. Renjamin Dr. Kangini	or Name Specializati derson Psychiatry awis Neurology linez Child and Adolescen nam Child and Adolescen ritinez Child and Adolescen ritinez Child and Adolescen ritinez Child and Adolescen with Pediatrics son Cardiology Ison Obstetrics and Gyme sssan Physical Medicine an m Physical Medicine an pro Physical Medicine an pro Physical Medicine an er Cardiothoracic Surg Cardiothoracic Surg Adams Neonatology Taylor Internal Medicine phym Pediatric Infectious E pgh Pediatric Infectious E pgh Pediatric Infectious C pellatric Infectious C pellatric Infectious C pellatric Infectious C pellatric Infectious C	4.89 4.87 4.87 1.1 1.2 1	1440 1551 142 142 1442 140 130 120 110 103 103 103 103 103 103 10	Rating 4 comment Rating 1, Need to co-operate Rating 4, Comment		
	Dr. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel M. Dr. Olivia Bro Dr. Entily Joh Dr. Ashley W. Dr. Ahmad H. Dr. Jihoon Ki Dr. Liam Tayl Dr. Samuel T Dr. Ernily Tun Dr. Kimberly, Dr. Benjamin Dr. Khadija R Dr. Sanguel S Dr. Michelle C Dr. Michelle C	or Name Specializati derson Psychiatry awis Neurology tinez Child and Adolescen tan Child and Adolescen trinez Child and Adolescen trinez Child and Adolescen win Pediatrics Cordiology Ison Obstetrics and Gym Ison Obstetrics and Ison Ison Obstetrics and Ison Ison Obstetrics and Ison Ison Ison Ison Ison Ison Ison Ison	489 487 487 487 487 487 487 489 489 489 479 479 479 479 479 479 479 479 480 489 480 489 489 480 489 480 489 480 489 480 489 480 489 489 480 489 480 489 480	1440 151 151 142 142 140 130 120 110 103 103 103 103 103 103 103 103 10	Rating 4.comment Rating 3.comment Rating 4.comment		
	Dr. Sophia Ar Dr. Jessica Da Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel Mi Dr. Olivia Bro Dr. Emily Joh Dr. Ashley Wi Dr. Ahmad Hi Dr. Ji-hon Ki Dr. Liam Tayl Dr. Samuel Tor. Emily Tun Dr. Mei Tan Dr. Kimberly, Dr. Sangay Si Dr. Sangay Si Dr. Macte Dr. Michelle C	or Name Specializati derson Psychiatry avis Neurology tinez Child and Adolescen han Child and Adolescen han Child and Adolescen han Child and Adolescen tartinez Child and Adolescen trinez Child and Adolescen with Pedatitics Scardiology Ison Obstetrics and Gyme Sison Obstetrics and Gyme Sison Obstetrics and Gyme Physical Medicine an m Physical Medicine an prof Physical Medicine ar prof Physical Medicine sur per Cardiothroacic Surge Cardiothroacic Surge Cardiothroacic Surge Internal Medicine pediatric infectious E hymn Pediatric infectious E pediatric infectious E arter Pediatric infectious E arter Surgery Cardiothroacic Surge Cardio	4.89 4.87 4.87 4.87 4.87 4.87 4.99 4.99 4.70 4.70 4	1440 151 142 142 142 140 130 120 110 103 103 103 100 127 127 127 120 100 135 135 135	Rating 4 comment Rating 5 Med to e-operate Rating 5 Acomment Rating 4 comment		
	Dr. Sophia Ar Dr. Jessica Mar Dr. Jessica Mar Dr. Ayesha Ki Dr. Rachel Mi Dr. Olivia Bro Dr. Emily Joh Dr. Ashley Wi Dr. Ashley Wi Dr. Ahmad Hi Dr. Ji-hon Ki Dr. Liam Tayl Dr. Samuel T Dr. Emily Tur Dr. Kimberly J Dr. Benjamin Dr. Khadija R Dr. Sangay Si Dr. Matthew C	or Name Specializati derson Psychiatry avis Neurology tinez Child and Adolescen han Pedatutics hoson Costetics and Gyne hysical Medicine and hysical Medi	4.89 4.87 1.48 1.47 1	1440 151 142 142 142 140 130 110 110 110 103 103 103 10	Rating 4 comment Rating 1, Need to co-perate Rating 4 comment		
	Or. Sophia Ar Dr. Jessica D Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel M. Dr. Olivia Bro Dr. Emily Joh Dr. Ashley W Dr. Ahmah H Dr. Ji-hoon Ki Dr. Liam Tayl Dr. Emily Tun Dr. Mei Tan Dr. Kimberly Dr. Benjamin Dr. Khadija R Dr. Sanga S Dr. Mid Cartel Dr. Michele C Dr. Michele S	or Name Specializati derson Psychiatry awis Neurology tinez Child and Adolescen tran Child and Adolescen tran Child and Adolescen tran Child and Adolescen tran Child and Adolescen win Pediatrics son Cardiology Ison Obstetrics and Gyne sssan Physical Medicine an m Physical Medicine an m Physical Medicine an ere Cardiolhoracic Surge Adams Neonatology Internal Medicine alman Pediatric Infectious I Taylor Internal Medicine alman Pediatric Infectious I Taylor Internal Medicine shman Pediatric Infectious I Taylor Internal Medicine shm	4.89 4.87 4.87 4.87 4.87 4.87 4.79 4.70	1440 151 142 142 142 140 130 120 110 103 103 103 103 100 127 127 120 100 135 135 135 135 130 135 136 137 138 139 139 139 140 150 160 170 170 170 170 170 170 170 17	Rating 4.comment Rating 3.comment Rating 4.comment		
	Or. Sophia Ar Dr. Sessica D Dr. Stella Mar Dr. Ayesha Ki Dr. Rache Ki Dr. Rache Ki Dr. Rache Ki Dr. Rache Ki Dr. Clivia Bro Dr. Emily Joh Dr. Ashley W Dr. Ahmad Ki Dr. Ji-hoon Ki Dr. Lam Tay Dr. Samuel T Dr. Emily Tun Dr. Mei Tan Dr. Kimbery Dr. Bengarin Dr. Khadija C Dr. Machael S Dr. Michael S Dr. Michael S Dr. Raine W Dr. Samuel T Dr. Samuel T Dr. Samuel T Dr. Michael S Dr. Ryota Su Dr. Michael S Dr. Ryota Su Dr. Isaiah Wh Dr. Isaiah Wh Dr. Isaiah Wh Dr. Kareem A Dr. Nicholas M Dr. Nicholas M	or Name Specializati derson Psychiatry awis Neurology titiez Child and Adolescen ham Child and Adolescen ratinez Child and Adolescen ratinez Child and Adolescen win Pediatrics Son Gardiology Ison Obstetrics and Gyne Ison Obstetrics and Indiana	4.89 4.87 4.87 4.87 4.79 4.80 4	1440 1551 142 142 1442 1440 130 150 150 150 150 150 150 150 150 150 15	Rating 4.comment Rating 5.comment Rating 4.comment		
	Dr. Sophia Ar Dr. Jessica Da Dr. Stella Mar Dr. Ayesha Ki Dr. Rachel Mi Dr. Olivia Bro Dr. Emily Joh Dr. Ashley Wi Dr. Ashley Wi Dr. Ashley Wi Dr. Ashley Wi Dr. John Mi Dr. Liam Tayl Dr. Samuel T Dr. Emily Tun Dr. Kimberly Dr. Sangay Si Dr. Macele Dr. Michelle C Dr. Matthew Dr. Michelle C Dr. Matthew Dr. Michelle C Dr. Matthew Dr. Ryeta Su Dr. Isaiah Wh Dr. Kareem A Dr. Nicholas V	or Name Specializati derson Psychiatry awis Neurology tinez Child and Adolescen trinez Child and Adolescen trinez Child and Adolescen trinez Child and Adolescen trinez Child and Adolescen wn Pediatrics Cardiology Ison Obstetrics and Gym Ison Obstetrics and Medicine ar mayor Physical Medicine ar mayor Physical Medicine ar mer Cardiothoracic Surge Mediatric Infectious I Taylor Internal Medicine ahman Pediatric Infectious I Sarcia Surgery mith Orthopedics Colorectal Surgery Itle Colorectal Surgery Itle Colorectal Surgery Itle Colorectal Surgery or Lee Ophthalmology or Lee or Lee Ophthalmology or Lee or Lee Ophthalmology	489	1440 1551 142 142 1442 140 130 103 103 103 103 103 103 10	Rating 4 comment Rating 1, Need to co-operate Rating 4 comment		

Future Work:

Following are some of the future enhancements and modifications that can be added -

- 1. Enhanced Input Validation: The mechanism to validate inputs will be further enhanced so that the integrity of the data is properly maintained and no invalid or incomplete data are entered. This would include stricter rating input checks, meaningful comments, prevention against duplicate/erroneous entry, and so on.
- 2. Advanced Filtering and Sorting: Advanced filtering and sorting need to be introduced in which users can sort their reviews based on rating, date, or look for some specific keywords. This would allow the patient and healthcare administrators to identify some feedback rapidly and relevantly, and track trends over time. It would also respond better to critical issues.
- 3. User Authentication and Role-Based Access Control: A strong authentication system for users should be developed that supports role-based access control. This will limit most of its functionalities to specific authorized users only, like the administrative users having the right

- to delete or modify reviews, while a patient can only create and view a review. This would add more security to the system in terms of safeguarding data.
- 4. User Interface and User Experience Enhancements: Invest in an easier and more engaging UI interface for the improvement of the overall user experience. It allows for layout optimization, readability improvement, and responsiveness to different devices. A more user-friendly design will make the system easier to use and more accessible, hence encouraging greater frequency and increasing engagement.

Conclusion:

This Java-based application is designed to make possible meaningful interfaces between the doctors and patients to uplift and enhance healthcare services. It has core features such as searching, submission of reviews, and rating aggregation of the doctors in the home menu. For improving effectiveness, the system has to strengthen data validation so that it can have reliability and credibility; also, it has to implement advanced filtering options to improve user experience and introduce user authentication with role-based access control for improved security. And, the UI/UX refinement will be a constant, leaving the system indispensable. It will continue to add resources to the user and stay relevant in the healthcare domain.

Appendix:

Source Codes -

1. Following is the source code for GUI.java:

```
import java.awt.Color;
import java.awt.EventQueue;
import java.awt.Font;
import java.awt.Image;
import java.io.File;
import java.io.FileNotFoundException;
import java.util.ArrayList;
import java.util.HashMap;
import java.util.Map;
import java.util.Scanner;
import javax.swing.ImageIcon;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JPanel;
import javax.swing.JScrollPane;
import javax.swing.JTabbedPane;
import javax.swing.JTable;
import javax.swing.border.EmptyBorder;
import javax.swing.table.DefaultTableModel;
public class GUI extends JFrame {
    private static final long serialVersionUID = 1L;
    private JPanel contentPane;
    private JTable table;
    private JScrollPane scrollPane;
    private JLabel hospital name;
    private ImageIcon img;
```

```
private JPanel home, search;
private Map<String, Doctor> doctors = new HashMap<>();
@author Nafis
 */
public static void main(String[] args) throws FileNotFoundException {
    GUI frame = new GUI();
    frame.setVisible(true);
}
public GUI() {
    setTitle("Brunel Hospital Management System");
    setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    setSize(900, 670);
    setLocationRelativeTo(null);
    contentPane = new JPanel();
    contentPane.setBackground(new Color(245, 255, 250));
    contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));
    setContentPane(contentPane);
    contentPane.setLayout(null);
    img = new ImageIcon(getClass().getResource("logo.png"));
    this.setIconImage(img.getImage());
    ImageIcon bannerIcon = new ImageIcon(getClass().getResource("Hospital.png"));
    Image image = bannerIcon.getImage();
    Image scaledImage = image.getScaledInstance(40, 35, Image.SCALE_SMOOTH);
    ImageIcon scaledIcon = new ImageIcon(scaledImage);
    JLabel bannerLabel = new JLabel(scaledIcon);
    bannerLabel.setBounds(0, 0, 70, 80);
    contentPane.add(bannerLabel);
    hospital_name = new JLabel("Brunel Hospital Management System");
    hospital_name.setBounds(65, 2, 500, 60);
    hospital_name.setFont(new Font("Bernard MT Condensed", Font.BOLD, 20));
    hospital_name.setForeground(Color.BLACK);
    contentPane.add(hospital name);
    JLabel address = new JLabel("Kingston Ln, London, Uxbridge UB8 3PH, UK");
    address.setBounds(65, 22, 500, 60);
    address.setFont(new Font("Forte", Font.PLAIN, 13));
    address.setForeground(Color.BLACK);
    contentPane.add(address);
    home = new JPanel();
    home.setBounds(235, 100, 600, 340);
    home.setBackground(new Color(245, 255, 250));
    home.setLayout(null);
    contentPane.add(home);
    scrollPane = new JScrollPane();
    scrollPane.setBounds(2, 2, 835, 488);
    home.add(scrollPane);
    table = new JTable();
    table.setBackground(new Color(245, 255, 250));
    scrollPane.setViewportView(table);
    JTabbedPane tp = new JTabbedPane();
    tp.setBounds(20, 85, 840, 520);
```

```
tp.addTab("Home", home);
        tp.addTab("Search Doctor", new Search(this));
        tp.addTab("Add Review", new AddReview(this));
        contentPane.add(tp);
        try {
            loadDoctors();
              updateDoctorTable(); //The loadDoctors() method reads doctor data from a
doctors.csv file, creates Doctor objects, and stores them in a Map<String, Doctor>. The
updateDoctorTable() method is used to display the loaded doctor data in a table format,
sorting them by average rating.
        } catch (FileNotFoundException e) {
            e.printStackTrace();
        }
        EventQueue.invokeLater(this::showDoctorReviews);
        // Used to maintain thread security. Also, since updating occurs, it is useful
        // when to update the GUI after the application has started.
   private void loadDoctors() throws FileNotFoundException {
        File file = new File("C:\\Implementation\\src\\doctors.csv");
        if (!file.exists()) {
            throw new FileNotFoundException("File not found: " + file.getAbsolutePath());
        }
        Scanner scanner = new Scanner(file);
        doctors.clear();
        if (scanner.hasNextLine()) {
            scanner.nextLine();
        while (scanner.hasNextLine()) {
            String line = scanner.nextLine();
            String[] details = line.split(",");
            if (details.length < 5) {</pre>
                System.err.println("Skipping invalid line: " + line);
                continue;
            }
            String name = details[0];
            String specialization = details[1];
            double rating;
            int numberOfReviews;
            String comment = details[4];
            try {
                rating = Double.parseDouble(details[2]);
                numberOfReviews = Integer.parseInt(details[3]);
            } catch (NumberFormatException e) {
                System.err.println("Skipping line due to parsing error: " + line);
                continue;
            }
            // Initialize Doctor object with totalRating and numberOfReviews from CSV
             Doctor doctor = new Doctor(name, specialization, rating * numberOfReviews,
numberOfReviews);
            doctor.addReview(new Review((int) rating, comment));
```

```
doctors.put(name, doctor);
           }
           scanner.close();
       }
       // Method to update the table with doctor data
       public void updateDoctorTable() {
           ArrayList<Doctor> doctorList = new ArrayList<>(doctors.values());
                     doctorList.sort((d1,
                                             d2)
                                                  ->
                                                       Double.compare(d2.getAverageRating(),
   d1.getAverageRating()));
           String[] columnNames = { "Doctor Name", "Specialization", "Average Rating", "Number
   of Reviews",
                    "Latest Review" };
           Object[][] data = new Object[doctorList.size()][5];
           // Attribute names for the table
           for (int i = 0; i < doctorList.size(); i++) {</pre>
               Doctor doctor = doctorList.get(i);
               data[i][0] = doctor.getName();
               data[i][1] = doctor.getSpecialization();
               data[i][2] = String.format("%.2f", doctor.getAverageRating());
               data[i][3] = doctor.getNumberOfReviews();
               Review latestReview = doctor.getLatestReview();
               data[i][4] = latestReview != null ? latestReview.toString() : "No reviews yet";
           }
           DefaultTableModel model = new DefaultTableModel(data, columnNames);
           table.setModel(model);
       }
       public void showDoctorReviews() {
           updateDoctorTable();
           scrollPane.revalidate();
           scrollPane.repaint();
       // Method to display doctor reviews. Also, scrollpane has been refreshed and
       // repainted by inbuilt methods.
       public Doctor getDoctor(String name) {
           return doctors.get(name);
       // Returns a Doctor object from the doctors map by name.
       public Map<String, Doctor> getDoctors() {
           return doctors;
       // Method to get all doctors (Returns the entire doctors map.)
   }
2. Following is the source code for Search.java:
   import java.awt.Color;
   import java.awt.Font;
   import java.awt.event.ActionEvent;
   import java.awt.event.ActionListener;
   import java.awt.event.KeyEvent;
   import java.awt.event.KeyListener;
   import java.io.FileWriter;
```

```
import java.io.IOException;
import java.util.ArrayList;
import javax.swing.JButton;
import javax.swing.JComboBox;
import javax.swing.JLabel;
import javax.swing.JOptionPane;
import javax.swing.JPanel;
import javax.swing.JScrollPane;
import javax.swing.JTable;
import javax.swing.JTextArea;
import javax.swing.JTextField;
import javax.swing.table.DefaultTableModel;
public class Search extends JPanel {
    private JTable doctorTable;
    private JTextField ratingTextField;
    private JTextArea commentTextArea;
    private Font f;
    private JButton searchButton, clearButton;
    private GUI parentGUI;
    public Search(GUI parent) {
        this.parentGUI = parent;
        setLayout(null);
        setBackground(new Color(255, 242, 242));
        // Parent GUI is used for it is a convenient way and code reuseablity is achieved
        f = new Font("Franklin Gothic Demi", Font.BOLD, 14);
        JLabel searchLabel = new JLabel("Search Doctor:");
        searchLabel.setBounds(10, 10, 100, 25);
        searchLabel.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
        add(searchLabel);
        JTextField searchTextField = new JTextField();
        searchTextField.setBounds(115, 11, 495, 25);
        searchTextField.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
        add(searchTextField);
        searchButton = new JButton("Search");
        searchButton.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
        searchButton.setBounds(620, 11, 100, 25);
        add(searchButton);
        clearButton = new JButton("Clear");
        clearButton.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
        clearButton.setBounds(720, 11, 100, 25);
        add(clearButton);
        JScrollPane scrollPane = new JScrollPane();
        scrollPane.setBounds(10, 50, 812, 425);
        add(scrollPane);
        doctorTable = new JTable();
        doctorTable.setBackground(new Color(255, 242, 242));
        scrollPane.setViewportView(doctorTable);
        // Similar to Parentclass
        searchButton.addActionListener(new ActionListener() {
```

```
@Override
            public void actionPerformed(ActionEvent e) {
                String searchQuery = searchTextField.getText();
                updateDoctorTable(searchQuery);
        }); // Search button invokes in two way. One case can be using search button, the
other case can be, using key pressed. In maintaining bullet proof coding, it has been
assured. So, both of the listeners work properly.
        searchTextField.addKeyListener(new KeyListener() {
            @Override
            public void keyTyped(KeyEvent e) {
                // Not used
            }
            @Override
            public void keyPressed(KeyEvent e) {
                if (e.getKeyCode() == KeyEvent.VK_ENTER)
         {
                    String searchQuery = searchTextField.getText();
                    updateDoctorTable(searchQuery);
                }
            }
            @Override
            public void keyReleased(KeyEvent e) {
                // Not used
            }
        });
        clearButton.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
             searchTextField.setText("");
             updateDoctorTable("NULL");
        }); // Clear button to maintain UI experience cleen and smooth
   }
   private void updateDoctorTable(String searchQuery) {
        ArrayList<Doctor> doctorList = new ArrayList<>(parentGUI.getDoctors().values());
                                                doctorList.removeIf(doctor
!doctor.getName().toLowerCase().contains(searchQuery.toLowerCase()));
       String[] columnNames = { "Doctor Name", "Specialization", "Average Rating", "Number
of Reviews", "Latest Review" };
        Object[][] data = new Object[doctorList.size()][5];
        for (int i = 0; i < doctorList.size(); i++) {</pre>
                                                // Gets the current doctor
            Doctor doctor = doctorList.get(i);
            data[i][0] = doctor.getName();
            data[i][1] = doctor.getSpecialization();
            data[i][2] = String.format("%.2f", doctor.getAverageRating());
            data[i][3] = doctor.getNumberOfReviews();
            data[i][4] = doctor.getLatestReview().toString();
        }
        DefaultTableModel model = new DefaultTableModel(data, columnNames);
        doctorTable.setModel(model);
   }
```

}

3. Follwoing is the source code for AddReview.java:

```
import java.awt.Color;
import java.awt.Font;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.awt.event.KeyListener;
import java.io.FileWriter;
import java.io.IOException;
import java.awt.event.KeyEvent;
import java.util.ArrayList;
import javax.swing.JButton;
import javax.swing.JComboBox;
import javax.swing.JLabel;
import javax.swing.JOptionPane;
import javax.swing.JPanel;
import javax.swing.JScrollPane;
import javax.swing.JTable;
import javax.swing.JTextArea;
import javax.swing.JTextField;
import javax.swing.table.DefaultTableModel;
public class AddReview extends JPanel {
    private JTable doctorTable;
    private JTextField ratingTextField;
    private JTextArea commentTextArea;
    private Font f;
    private JButton searchButton, clearButton;
    private GUI parentGUI;
    public AddReview(GUI parent) {
        this.parentGUI = parent;
        setLayout(null);
        setBackground(new Color(199, 219, 222));
        f = new Font("Franklin Gothic Demi", Font.BOLD, 14);
        JLabel searchLabel = new JLabel("Search Doctor:");
        searchLabel.setBounds(10, 10, 100, 25);
        searchLabel.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
        add(searchLabel);
        JTextField searchTextField = new JTextField();
        searchTextField.setBounds(115, 11, 495, 25);
        searchTextField.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
        add(searchTextField);
        searchButton = new JButton("Search");
        searchButton.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
        searchButton.setBounds(620, 11, 100, 25);
        add(searchButton);
        clearButton = new JButton("Clear");
        clearButton.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
        clearButton.setBounds(720, 11, 100, 25);
        add(clearButton);
        JLabel ratingLabel = new JLabel("Rating:");
        ratingLabel.setBounds(10, 260, 80, 25);
```

```
ratingLabel.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
add(ratingLabel);
ratingTextField = new JTextField();
ratingTextField.setBounds(115, 260, 495, 25);
ratingTextField.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
add(ratingTextField);
JLabel commentLabel = new JLabel("Comment:");
commentLabel.setBounds(10, 295, 80, 25);
commentLabel.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
add(commentLabel);
commentTextArea = new JTextArea();
commentTextArea.setFont(new Font("Franklin Gothic Demi", Font.PLAIN, 14));
JScrollPane commentScrollPane = new JScrollPane(commentTextArea);
commentScrollPane.setBounds(115, 295, 495, 50);
add(commentScrollPane);
JButton submitButton = new JButton("Submit Review");
submitButton.setFont(f);
submitButton.setBounds(620, 260,200, 25);
add(submitButton);
JScrollPane scrollPane = new JScrollPane();
scrollPane.setBounds(10, 50, 812, 200);
add(scrollPane);
doctorTable = new JTable();
doctorTable.setBackground(new Color(199, 219, 222));
scrollPane.setViewportView(doctorTable);
searchButton.addActionListener(new ActionListener() {
    @Override
    public void actionPerformed(ActionEvent e) {
        String searchQuery = searchTextField.getText();
        updateDoctorTable(searchQuery);
});
searchTextField.addKeyListener(new KeyListener() {
    @Override
    public void keyTyped(KeyEvent e) {
        // Not used
    }
    @Override
    public void keyPressed(KeyEvent e) {
        if (e.getKeyCode() == KeyEvent.VK_ENTER)
 {
            String searchQuery = searchTextField.getText();
            updateDoctorTable(searchQuery);
        }
   }
    @Override
    public void keyReleased(KeyEvent e) {
        // Not used
});
```

```
submitButton.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                addReview();
                updateDoctorTable("NULL");
                searchTextField.setText("");
                ratingTextField.setText("");
                commentTextArea.setText("");
            }
        });
        clearButton.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
             searchTextField.setText("");
             ratingTextField.setText("");
             commentTextArea.setText("");
            updateDoctorTable("NULL");
        });
   }
private void updateDoctorTable(String searchQuery) {
        ArrayList<Doctor> doctorList = new ArrayList<>(parentGUI.getDoctors().values());
                                                   doctorList.removeIf(doctor
!doctor.getName().toLowerCase().contains(searchQuery.toLowerCase()));
       String[] columnNames = { "Doctor Name", "Specialization", "Average Rating", "Number
of Reviews", "Latest Review" };
        Object[][] data = new Object[doctorList.size()][5];
        for (int i = 0; i < doctorList.size(); i++) {</pre>
            Doctor doctor = doctorList.get(i);
            data[i][0] = doctor.getName();
            data[i][1] = doctor.getSpecialization();
            data[i][2] = String.format("%.2f", doctor.getAverageRating());
            data[i][3] = doctor.getNumberOfReviews();
            data[i][4] = doctor.getLatestReview().toString();
        }
        DefaultTableModel model = new DefaultTableModel(data, columnNames);
        doctorTable.setModel(model);
    // Till this, the code is very much similar to Search.java
   private void addReview() {
        int selectedRow = doctorTable.getSelectedRow();
         // Here one thing is that, by searching, there is a possibility of having two
doctors with the same name or nickname. In this case, specification determines their
differences and the patient gets to select which of the doctor he/she wants to select and
review. For, he must review by selecting the particular row.
        if (selectedRow == -1) {
            System.err.println("No doctor selected");
            return;
        }
        String selectedDoctor = (String) doctorTable.getValueAt(selectedRow, 0);
        String ratingText = ratingTextField.getText();
```

```
String commentText = commentTextArea.getText();
           int rating;
           // System.out.println(selectedDoctor);
               rating = Integer.parseInt(ratingText);
               if (rating < 1 | rating > 5) {
                           JOptionPane.showMessageDialog(null, "You must rate within 1-5
   !","WARNING!!!", JOptionPane.WARNING MESSAGE);
                   // System.err.println("Invalid rating: " + rating);
                   return;
               }
           } catch (NumberFormatException e) {
               // System.err.println("Invalid rating input: " + ratingText);
               JOptionPane.showMessageDialog(null, "You must rate within 1-5 !","WARNING!!!",
   JOptionPane.WARNING MESSAGE);
               return;
           }
           // Retrieve the doctor object from the parent GUI
           Doctor doctor = parentGUI.getDoctor(selectedDoctor);
           if (doctor != null) {
               // Add the new review to the doctor
               doctor.addReview(new Review(rating, commentText));
               // Update the doctor table and refresh the view
               parentGUI.updateDoctorTable();
               parentGUI.showDoctorReviews();
               // Clear input fields
               ratingTextField.setText("");
               commentTextArea.setText("");
                 JOptionPane.showMessageDialog(null, "Review Added Successfully!", "Success in
   Submission !", JOptionPane.INFORMATION_MESSAGE);
               // Append the review to the CSV file
               try (FileWriter writer = new FileWriter("C:\\Implementation\\src\\doctors.csv",
   true)) {
                           writer.write(String.format("\n%s,%s,%.2f,%d,%s", doctor.getName(),
   doctor.getSpecialization(),
                                   doctor.getAverageRating(),
                                                                 doctor.getNumberOfReviews(),
   commentText));
               } catch (IOException e) {
                   e.printStackTrace();
           }
       }
   }
4. Following is the source code for Doctor.java:
   import java.lang.reflect.Method;
   import java.util.ArrayList;
   import java.util.List;
   public class Doctor {
       private String name;
       private String specialization;
       private double totalRating;
       private int numberOfReviews;
       private List<Review> reviews;
```

```
public Doctor(String name, String specialization, double totalRating,
                                                                                            int
   numberOfReviews) {
           this.name = name;
           this.specialization = specialization;
           this.totalRating = totalRating;
           this.numberOfReviews = numberOfReviews;
           this.reviews = new ArrayList<>();
       public void addReview(Review review) {
           reviews.add(review); // Add the new review to the list
           totalRating += review.getRating();
           numberOfReviews++; // Increment the number of reviews
       } // Method to add a review for the doctor
       public String getName() {
           return name;
       public String getSpecialization() {
           return specialization;
       public double getAverageRating() {
           return numberOfReviews > 0 ? totalRating / numberOfReviews : 0;
       }
       public int getNumberOfReviews() {
           return numberOfReviews-1;
       }
       public Review getLatestReview() {
           \ensuremath{//} Return the last review if there are any, otherwise return null
           return reviews.size() > 0 ? reviews.get(reviews.size() - 1) : null;
       // Method to get the latest review for the doctor
   }
5. Follwoing is the source code for Review.java:
   public class Review {
       private int rating;
       private String comment;
       public Review(int rating, String comment) {
           this.rating = rating;
           this.comment = comment;
       } //constractor
       public int getRating() {
           return rating;
       public String getComment() {
           return comment;
       } //getters
       @Override
       public String toString() {
           return "Rating: " + rating + "," + comment;
     }
```