BCA SEM 6						
Sr. No	**Type Of Course**	**Subject**	**Credit**	**CCE**	**SEE**	**Total**
1	Major-14	**CS –35 :** Mobile Application Development in Android using Kotlin	4	50	50	100
2	Major-15	**CS –36 :** Programming with ASP.NET	4	50	50	100
3	Major-16	**CS –37 :** Machine Learning with Python	4	50	50	100
4	Minor-06	**CS –38 :** Practical Based on CS-35, CS-36, CS-37	4	50	50	100
5	AEC	**CS –39 :** Introduction of Cloud Computing	2	25	25	50
6	SEC (Internship)	**CS –40 :** Internship	4	0	100	100

CS-35: Mobile Application Development in Android using Kotlin

Objectives:

- Understanding Android Development.
- Familiarize students with the Kotlin Programming Language
- Gain necessary knowledge and skills to develop high-quality Android applications using Kotlin.

Prerequisites:

- Basic Programming Knowledge
- Basic Understanding of Java and XML
- Knowledge of OOP Concepts

Unit No.	Topic	Detail
1	Introduction to Kotlin Programming	• Basics of Kotlin, Operations and Priorities, • Decision Making • Loop Control, Data Structures(Collections), • Functions • Object Oriented Programming: Inheritance abstract, interface, super and this, visibility modifiers.
2	Introduction to Android & Android Application Design	• The Open Handset Alliance, The Android Platform, Android SDK • Building a sample Android application • Anatomy of an Android applications, Android terminologies • Application Context, Activities, Services, Intents • Receiving and Broadcasting Intents • Android Manifest File and its common settings • Using Intent Filter, Permissions • Managing Application resources in a hierarchy • Working with different types of resources

3	Android User Interface Design	• User Interface Screen elements
		  • Button, EditText, TextView, DatePicker, TimePicker, ProgressBar, ListView, GridView, RadioGroup, ImageButton, Fragement
		• Designing User Interfaces with Layouts
		  • Relative Layout, Linear Layout, Table Layout etc
		• Dialogs
		• Drawing and Working with Animation
		  • Frame By Frame Animation
		• Twined Animation

4	Database Connectivity Using SQLite and Content Provider	• Using Android Data and Storage APIs • Managing data using SQLite • Sharing Data Between Applications with Content Providers

5	Location Based Services (LBS), Common Android API, Notifications, Services, Deployment of applications	• Using Global Positioning Services (GPS) • Geo coding Locations • Mapping Locations • Many more with location based services • Android networking API • Android web API • Android telephony API • Notifying the user, Notifying with the status bar • Vibrating the phone • Blinking the lights • Customizing the notifications Services • Application development using JSON in MySQL • Publish android application

Notes: Android application must be developed using ANDROID STUDIO 4.0

Reference Books:

(1) Learn Android Studio3 with Kotlin–TegHagos–Apress–2019
(2) Head first Kotlin, A Brain Friendly Guide–Dawn Griffiths, David Griffiths–Orilly–2019
(3) Professional Android2 Application Development Reto Meier,Wiley India Pvt Ltd (2011)
(4) Beginning Android Mark L Murphy, Wiley India Pvt Ltd
(5) Android Developer Fundamental Course – Practical Book – 2018

Course Outcomes:

- Understand the basic of KOTLIN programming.
- Understand the basic of Android and Android Application Design.
- Understand the different user interface elements and develop application with those widgets.
- Understand, apply and develop application with SQLite and Content Providers.
- Understand, apply and develop application with Location based services, notification services.

CS-36: Programming with ASP.NET

Objectives:

- Familiarize students with the basic concepts of ASP.NET
- Explore the different approaches to building web applications in ASP.NET
- Learn to integrate databases with ASP.NET applications using technologies like ADO.NET

Prerequisites:

- Basic Programming Knowledge
- Basic Understanding of HTML, CSS, OOP Concepts and C#.NET
- Having a general understanding of web development concepts such as client-server architecture, web servers etc.

Unit No.	Topic	Detail

1	Framework and Web Contents Validation Controls	• Overview of Asp.NET Framework
		• Client Server Architecture
		• Application Web Servers
		• Types of Files in Asp.NET
		• Types of controls in Asp.NET
		• Page Architecture
		• Web form
		• Introduction to standard Controls (Buttons, Textbox, Checkbox, Lable, Panel, Listbox, Dropdownlist etc.)
		• Running an Asp.Net Application, File Upload Control
		• What is Validation?
		  ◦ Client Side Validation
		  ◦ Server Side Validation
		• Types (RequieredField Validator, Range Validator, CompareField Validator, RegularExpression Validator, Custom Validator, ValidationSummery Control)

2	State Management	• What is State? • Why it is required in Asp.Net? • Client Side State Management • Server Side State Management • Various State Management Techniques (View State, Query String, Cookie, Session State,Application State)
3	ADO .NET and Database	• Architecture of ADO.NET • ADO.NET Classes for Connected and Disconnected Architecture (Connection, Command,DataReader, DataAdapter, DataSet, DataColumn, DataRow, DataConstraints, DataView etc.) • TheGridview Control, TheRepeater Control • Binding Datato DataBound Controls, • Diplaying Data in a webpage using SQLDataSource Control • DataBinding Expressions

4	Master Pages and Theme Caching, Application Pages and Data	• What is MasterPage?
		• Requirement Of a Master Page in an Asp.NET application
		• Designing Website with Master Page, Theme and CSS
		• Overview of Caching
		  o PageOutput Caching
		  o Partial Page Caching, Absolute Cache Expiration
		  o Sliding Cache Expiration
		  o Data Caching

5	Working with XML ASP.NET Application Configuration and Deployment of Application	• Reading Datasets FromXML • Writing DataSets With XML • WebServices (Introduction, HTTP, SOAP, UDDI,XML, Creating a Web Service, Consuming a Web Service) • Introduction To Web.Config • Common Configuration Sections • AppSettings • Tracing • Custom Errors • Authentication And Authorization • Deployment of Application in web server

Reference Books:

- ASP.NET - Unleashed
- ASP.NET – Wrox Publication
- Pro ASP.NET Core MVC 2 Book by Adam Freeman
- Introduction to ASP.NET Web Programming using the Razor Syntax (C#) by Tom FitzMacken

Course Outcomes:

- Understand the ASP.NET framework and different controls.
- Understand form validation, apply form validation control also understand state management.
- Understand ADO .NET architecture and developing application with LINQ.
- Understand and apply concept of Master Page, CSS & Theme.
- Understand configuration of application with XML.

CS-37: Machine Learning with Python

Objectives:

- To Understand and develop model of ML with Python.
- Apply ML techniques to real-world data sets and problems.
- Learn how to deploy machine learning models into production environments.

Prerequisites:

- Basic Understanding of Python Programming.

Unit No.	Topic	Detail
1	Introduction to Machine Learning	• Introduction to ML, Relation of ML with AI and DL, Defining Machine Learning, How machines learn, types of machine learning: supervised learning, unsupervised learning, reinforcement learning, applications of machine learning.
2	Supervised Learning	• Regression: Pre-processing data using different techniques – mean removal, scaling, normalization, binarization, label encoding, linear regression, case study implementation using Python • Classification: Building simple classifier, logistic regression classifier, Naïve bayes classifier, training and testing dataset, accuracy using cross-validation, visualizing confusion matrix, extracting the performance report. • Predictive Modeling: Building linear and non-linear classifier using Support Vector Machine (SVM), extracting confidence measurements, Case study implementation using Python.
3	Unsupervised Learning	• Clustering: Data using k-means clustering, compressing image using vector quantization, mean shift clustering model, agglomerative clustering, case study implementation using Python.
4	Natural Language Processing	• Natural Language Processing: o pre-processing data, o stemming data, o using lemmatization, o diving chunks, o text classifier, o case study implementation using Python.
5	Computer Vision with OpenCV	• Object Detection: o Detecting and tracking objects using Haar cascades from images and videos o Detecting face, eyes, mouth, nose, pupils

Reference Books:

▪ "Machine Learning" by Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das - Pearson

- "Python Machine Learning Cookbook" by Prateek Joshi – PACKT Publishing – 2016 Edition.
- "OpenCV: Computer Vision Projects with Python – Learning Path" by Joseph howse, Prateek Joshi, Michael Beyeler – PACKT Publishing – 2016 Edition.

Course Outcomes:

- To define and explain machine learning and its relation with AI and DL along with types of ML.
- To determine regression or classification supervised learning method of ML to any real-life application and estimate accuracy of the model.
- To be able to contrast various unsupervised learning methods and solve any real0life situation using ML and estimate accuracy of the model.
- To solve any fundamental text-processing.
- To construct a model to detect object from it.

CS-38: Practical Based on CS – 35, CS-36 and CS – 37	
CCE- Continuous and comprehensive Evaluation as follow • The continuous Comprehensive Evaluation (CCE) for each subject will be conducted by the teacher of that subject. The teacher will decide how the evaluation will be done. Usually CCE includes things like class participation, case studies and presentation, assignments, tutorials, small test (announced or surprised), quizzes and attendance or a mix of these. • Students must submit their work for internal evaluation on time to time. • Another part of CCE is the mid-term exam, which is compulsory for all students. This exam will be conducted internally by the college.	50 Marks
SEE – Semester End Examination as per the following • Practical exams may be scheduled before or after the theory examinations. Exam is conducted by Saurashtra University using external examiner (3 hours duration) • Students must prepare a practical notebook/book for the final practical examination. (The practical book serves as a record of all practical work, observations, procedures and results performed during the semester in lab. It is essential for evaluation during the final practical examination)	50 Marks

CS-38: Practical Based on CS – 35, CS-36 and CS – 37	**Total Marks - 100**	
Topics	**CCE**	**SEE**
CS-35: Mobile Application Development in Android using Kotlin	**20**	**20**
CS-36: Programming with ASP.NET	**15**	**15**
CS-37: Machine Learning with Python	**15**	**15**

CS-39: Introduction of Cloud Computing		
Unit No.	**Topic**	**Detail**
1	Introduction to Cloud Computing	• Introduction • Evolution • Benefits and berries • Cloud SPI Models • Cloud Computing vs Cluster computing • Cloud Architecture
2	Management in Cloud Computing	• Service Level Agreements (SLAs) • Quality of Service (QoS) • Scaling cloud hardware • Managing data • Cloud Security and Privacy
3	Cloud Computing Standards	• Cloud computing standards and interoperability • Technical considerations for migration to the cloud • Cloud Services • Case Studies

Reference Books:

- K Saurabh, Cloud Computing, 2nd Edition, Wiley India
- V Joysula, M Orr, G Page, (2012) Cloud Computing: Automating the VirtualizedData Center: Cisco Press.
- Mei- Ling Liu, (2004) "Distributed Computing: Principles and Application",PearsonEducation, Inc. New Delhi
- Miller M, (2008) Cloud Computing, 8th Edition, Que Publishers.
- Buyya R K, (2011) Cloud Computing: Principles and Paradigms, Wiley Press.

Course Outcomes:

- Analyses the phases of transition from classic datacenter to virtual data center and then to the cloud.
- Implement the key characteristics, services, anddeployment models of cloud.

CS-40: Internship - 100 Marks

Objectives:

- To apply theoretical concepts learned in previous semesters to practical software development.
- To gain hands-on experience in using programming languages, tools, and technologies.
- To understand and implement the complete Software Development Life Cycle (SDLC).
- To enhance problem-solving and analytical skills by designing solutions to real-life problems.
- To develop teamwork and collaboration skills through group-based project execution.
- To improve project planning and time management abilities.
- To practice documentation and reporting skills as per industry standards.
- To prepare students for major projects, internships, or professional roles in software development.

No.	Topic	Guidelines for Internship	
1	General	• Students must get prior approval from the college before starting the internship / project topic. • Choose an Internship/project topic • Projects can be individual or group-based (2 Students)(as per college policy) • Submit a project proposal with the title, objective, scope, tools/technologies to be used, and team members. • Get the proposal approved by the project guide/faculty coordinator. • Use any suitable programming language or platform • Project must be developed in any Company / Organization /Institute or computer laboratory of college. • Students must maintain a daily activity log during the internship.	
2	Documentation	Maintain a project report including the following: • Title Page • Certificate • Acknowledgment • Table of Contents • Introduction & Objective • System Analysis (Problem Definition, Feasibility Study) • System Design (DFD, ER Diagram, etc.) • Data Dictionary • Implementation (Screenshots) • Testing (Test cases and results) • Conclusion & Future Scope	
3	Submission	• Submit a soft copy (CD/ Pen drive) and hard copy of the project report. Project report must be printed on both side of the page. • Project must be submitted before two weeks of commencement of theory exam • During the project viva examination project must be run.	
4	Assessment Criteria	SEE –Exam is conducted by Saurashtra University using external examiner (examiner will evaluate the executable copy, hard copy of the project and take the viva voce)	100 Marks

BCA-6 **CS –35: Mobile Application Development in Android using Kotlin** **Minimum following exercise should be performed by the students during the semester**	
(1)	Write a Kotlin program to Print "Hello World".
(2)	Write a Kotlin program to Print Name and Address (Use Println()).
(3)	Write a Kotlin Program to calculate the Area of a Circle given the radius. (Area = $\pi \times r^2$)
(4)	Write a Kotlin code to check if a year is a leap year or not. (Use if- else)
(5)	Write a Kotlin program to check if a given number is Odd or Even. (Use if- else)
(6)	Write a Kotlin program to check if a given number is Positive, Negative, or Zero. (Use if-else ladder)
(7)	Write a Kotlin Program to Print Day of the Week (1-7). (Use when)
(8)	Write a Kotlin program to print the name of the month based on a given number (1-12). (Use when)
(9)	Write a Kotlin program to take 3 numbers and find Maximum number out of that number. (Use Nested If)
(10)	Write a Kotlin program to print 5 times "Hello". (Use do – while loop)
(11)	Write a Kotlin program to print sum of 1 to 10 numbers. (Use do – while loop)
(12)	Write a Kotlin program to print odd numbers between 1 and 10. (Use for loop)
(13)	Write a Kotlin program to 10 to 1 numbers. (Use while loop)
(14)	Write a Kotlin program to print sum of all even numbers between 1 and 10. (Use while loop)
(15)	Write a Kotlin program to find the Factorial of a number using a 'while' loop.
(16)	Create an Immutable List of 3 cities and print them using a loop. (Use listOf())
(17)	Assign key to Immutable List of 3 cities and print based on key using a loop. (Use mapOf())
(18)	Create a mutable list of 3 cities and add 2 more cities after creation print using a loop. (Use mutableListOf())
(19)	Create a set of integers, add elements to it, and print all elements using a loop. (Use mutableSetOf())
(20)	Create UDF in Kotlin to perform Addition of 2 number. (Use No Argument No Return)
(21)	Create UDF in Kotlin to perform take mark of 3 subject, calculate total and percentage. (Use No Argument No Return)
(22)	Create UDF in Kotlin to take a number and print square of that number. (Use With Argument No Return)
(23)	Create UDF in Kotlin to take a number and print Cube of that number. (Use No Argument With Return)
(24)	Create UDF in Kotlin to perform Multiplication of 2 number. (Use With Argument With Return)
(25)	Create a Base class 'Person' with a properties 'name' and 'age', Derive a class 'Student' with a properties 'rollno' also add display() method in Student class which displays rollno, name and age. (Use Single Inheritance)
(26)	Create a Base class 'Person' with a properties 'name' and 'age', Intermediate base class 'Student' with a properties 'rollno', Derive a class 'Result' with a properties 'percentage' also add display() method in Result

	class which displays rollno, name, age and percentage. (Use Multilevel Inheritance)
(27)	Create a Base class 'Person' with a properties 'name' and 'age', Derive 1 a class 'Student' with a properties 'percentage' also add display1() method in Student class which displays name, age and percentage, Derive 2 a class 'Employee' with a properties 'salary' also add display2() method in Employee class which displays name, age and salary. (Use Hierarchical Inheritance)
(28)	Create two Base classes 'Mydate' and 'Mytime' having properties 'date1' and 'time1' respectively, Derive a class 'Mycalendar' which contains display() method to print date1 and time1. (Use Multiple Inheritance, Interface, Override Keyword)
(29)	Create an Abstract class 'Shape' with an abstract method area() Derive a class 'Rectangle' that implements area() method to compute the area of a rectangle. (Area = l × w)
(30)	Create a class 'Parent' with a method display(), a class 'Child' that overrides display() and calls the parent's method using 'super' keyword.
(31)	Create a class 'BankAccount' with a private property 'balance' and public methods deposit() and withdraw(). Demonstrate encapsulation.
(32)	Write a program to print "Saurashtra University" in TextView.
(33)	Write a program to print Hello World using reference to resource.
(34)	Write a program that displays your name. Use kotlin to provide your name.
(35)	Make an Android app that allows users to toast (message) "Saurashtra University" by clicking on a button.
(36)	Create an Android app that allows users to enter two strings using different EditText, click a Button to merge those two strings, and display the results in a Toast.
(37)	Create an Android app having two Buttons and one TextView to display message 'Button 1 is Clicked' or 'Button 2 is Clicked'.
(38)	Write a program for Login Application. (Take default value of username and password as admin, admin subsequently) Display appropriate message in toast if login is successful or not.
(39)	Write a program for Registration page. (Name, Gender (Radio button), Mobile Number, Address, Hobbies (Checkbox), submit button) Once submit button is clicked, display all the information in textview.
(40)	Write a program to input two numbers using different EditText, add four Buttons 'Add', 'Sub', 'Mul', 'Div' display result in TextView while clicking on a Buttton.
(41)	Write a program to input mark of 3 subjects calculates and print Total and Percentage. (Use total=m1+ m2 +m3, per=total/3)
(42)	Create an Android application to calculate and print Simple Interest. (Use si=p*r*n/100)
(43)	Write a program in which puts two Radio Button 'Male' and 'Female' inside RadioGroup. Print "Male is Radio Button" or "Female Radio Button" in Toast. (Use onCheckedChanged())
(44)	Develop an Android application with RadioButtons labeled Red, Green, and Blue. When a RadioButton is selected, the background color of the screen should change to the selected color. (Use setBackgroundColor())
(45)	Write a program that takes four Radio Button 'Image1', 'Image2', 'Image3', 'Image4' by clicking on it will set Background Image with Selected Image. (Use

	setBackgroundResource(), drawable folder)
(46)	Create an Android application with three CheckBoxes labeled 400, 700, and 900, and a Button. When the button is clicked, the app should add the values of the selected CheckBoxes and display the total in a TextView.
(47)	Write a program that takes two CheckBox 'Bold', 'Italic' and one TextView having text "Saurashtra University by clicking on CheckBox apply selected effect on TextView. (Use setTypeface())
(48)	Write a program in which add List of Cities in String.xml File, fetch it in to ListView Widget, and print selected value of ListView in Toast. (Use getResources(), getStringArray())
(49)	Create Array of Cities, add it to ListView Widget, and print selected value of Spinner in Toast. (Use ArrayAdapter())
(50)	Create an Android application that displays a ListView containing the color options: Red, Green, and Blue. When a color is selected from the list, the background color of the screen should change to the selected color. (Use setBackgroundColor(),ArrayAdapter())
(51)	Write a program that when a button is clicked, the ProgressBar will begin to progress until it reaches 100. (Use Horizontal ProgressBar, Thread)
(52)	Write a program to Add List of Cities in strings.xml file, fetch it into an AutoCompleteTextView widget, and provide suggestions (Use setAdapter())
(53)	Write a program to add List of Cities in String.xml File, Fetch it in to MultiAutoCompleteTextView Widget, and provide Multiple Suggestions. (Use setAdapter(),setTokenizer())
(54)	Write a program that uses a DatePickerDialog in an Android app to allow the user to select a date. Once a date is chosen, display the selected date in a TextView using Kotlin.
(55)	Write a program that uses a TimePickerDialog in an Android app to allow the user to select a time. Once a time is chosen, display the selected time in a TextView using Kotlin.
(56)	Write a program that displays AlertDialog() having Ok button only, when the user clicks on it will update the TextView with "Ok button is Clicked". (Use AlertDialog.BUTTON_NEUTRAL)
(57)	Write a program that displays AlertDialog() having Yes and No buttons, when the user clicks on it will update the TextView with "Yes button is Clicked" or "No button is Clicked". (Use setPositiveButton, setNegativeButton)
(58)	Write a program that displays AlertDialog() having Ok and Cancel buttons, when the user clicks on it will update the TextView with "Ok button is Clicked" or "Cancel button is Clicked". (Use setPositiveButton, setNegativeButton)
(59)	Write a program that creates two activities: First Activity – It has an EditText to enter a name and a Button. When the button is clicked, it opens the second activity. Second Activity – It has a TextView that shows the name received from the First Activity. (Use Intent)
(60)	Develop an android app to pass data to another activity. (Use Intent)
(61)	Write a program that creates two activities: First Activity – It has an EditText to enter a name and a Button. When the button is clicked, it opens the second activity. Second Activity – It has two TextView 1st shows Hello and 2nd shows the name

	received from the First Activity. (Use Intent)
(62)	Create an Android application that performs a Horizontal translation animation on an ImageView, where the image moves from left to right across the screen. (Use anim folder, AnimationUtils, loadAnimation)
(63)	Create an Android application that performs a Vertical translation animation on an ImageView, where the image moves from up to down across the screen. (Use anim folder, AnimationUtils, loadAnimation)
(64)	Make an Android application that performs animation on ImageView to rotate image in a Clockwise. (Use anim folder, AnimationUtils, loadAnimation)
(65)	Make an Android application that performs animation on ImageView to rotate image in an Anti-clockwise. (Use anim folder, AnimationUtils, loadAnimation)
(66)	Create an Android application that applies a scale animation to an ImageView, creating a zoom-in effect on the image when triggered. (Use anim folder, AnimationUtils, loadAnimation)
(67)	Create an Android application that applies a scale animation to an ImageView, creating a zoom-out effect on the image when triggered. (Use anim folder, AnimationUtils, loadAnimation)
(68)	Create Android application to apply Frame By Frame Animation.
(69)	Write a program in which set 3 columns GridView with 6 cities name, clicking on it will display selected city name in Toast. (Use ArrayAdapter, onItemClick())
(70)	Write a program in which set 2 columns GridView with 4 color name, clicking on it will apply selected color in Background. (Use ArrayAdapter, onItemClick())
(71)	Write a program in which divide MainAcitivity in two Fragment. 1st Fragment prints “Saurashtra” and 2nd Fragment prints “University” in TextView. (Use Fragment())
(72)	Write a program in which divide MainAcitivity in three Fragment. 1st Fragment prints “Saurashtra”, 2nd Fragment prints “University” and 3rd Fragment prints “Rajkot” in TextView. (Use Fragment())
(73)	Create an Android application to demonstrate Activity Life Cycle. (Use onCreate(), onStart(), onResume(), onPause(), onStop(), onDestroy() etc.)
(74)	Make Android application to share simple text using concept of Shared Intent. (Use setAction(), setType(), createChooser())
(75)	Write a program in which add name, city and gender in EditText, clicking on Save button will create and save data in key-value format. (Use SharedPreference())
(76)	Write a program in which adds username and email in EditText, clicking on Save button will create and save data in key-value format. (Use SharedPreference())
(77)	Create an Android application that allows reading from and writing data to internal storage.
(78)	Develop an Android app that enables users to save data to the device's external storage and retrieve it later.
(79)	Create an Android application that allows the user to insert student records (roll no, name, course) into a local SQLite database, and display the stored records in a ListView.
(80)	Develop an Android application that provides search functionality, allowing the user to search for student records by roll no, and display the matching results from the database.

(81)	Write a program that performs CRUD operation on Student database. (Use SQLite database)
(82)	Create an android application to perform create, insert, and delete operation on Employee database having fields like eid, enm, phno, sal (Use SQLite database)
(83)	Write a program that performs CRUD operation on Department table having fields like deptid, deptnm.
(84)	Create an android application to perform create, insert, and delete operation on Book Master database having fields like book_id, book_name, author_name, book_price (Use SQLite database)
(85)	Create an Android application to perform Login Activity having EditText (username and password), buttons (Login, Save). When user clicks on "Login" button will check username and password in database if it is matched with inputted value then switch to next Activity. When user clicks on "Save" button will insert record in Login table. (Use SQLite database)
(86)	Create an Application to check network is available or not. (Set Permission ACCESS_NETWORK_STATE, INTERNET, ConnectivityManager)
(87)	Create an Android application that provides your cell details like (IMEI, SIM Number, and Operator Name etc.). (Set Permission READ_PHONE_STATE, TelephonyManager)
(88)	Create an Android application to Listen phone state and check phone is Idle, Off-hook or Ringing. (Use StateMonitor, PhoneStateListener())
(89)	Create an Android application that opens the provided URL in WebView control.
(90)	Create an Android application that displays a webpage in a WebView component and shows a ProgressBar while the page is loading.
(91)	Create an Android application that sends sms to the provided mobile numbers.
(92)	Create an Android application to notify user with status bar. (Use NotificationManager)
(93)	Create an Android application to update notification of user in status bar. (Use Notification, Builder, notify())
(94)	Create an Android application that notifies the user with status bar and vibration in device. (Set Permission VIBRATE)
(95)	Create an Android activity that includes a ToggleButton. When the button is toggled: Display a Toast message saying "Service is Started" when it is turned ON. Display "Service is Destroyed" when it is turned OFF. (Use Service, onStartCommand(),onDestroy())
(96)	Create an Android application to fetch current latitude and longitude of device. (Set Permission ACCESS_COARSE_LOCATION, ACCESS_FINE_LOCATION, INTERNET)
(97)	Display Country name, City name and Postal Code from latitude and longitude. (Use Geocoder, getFromLocation())
(98)	Create an Android application that fetches student data from a MySQL database using a PHP script. The PHP script queries the database and returns the data in JSON format, which is then parsed and displayed in the Android app using a ListView.

BCA-6 **CS –36: Programming with ASP.NET** **Minimum following exercise should be performed by the students during the semester**	
(1)	WAP (1) to display "Hello World" on web page (2) Demonstrate client-side validation using a RequiredFieldValidator
(2)	Create a form with Textbox, Button, Checkbox and retrieve values and demonstrate file upload functionality using the FileUpload Control
(3)	WAP to use RegularExpressionValidator to validate phone number format.
(4)	WAP which (1) implements various validation controls. Add a ValidationSummary to display error messages (2) compare password and confirm password. (Use CompareValidator)
(5)	WAP to (1) create a web form with ListBox and display selected items on button click (2) Demonstrate RangeValidator to accept date between 01/01/2000 to Current Date.
(6)	Create web form with Textbox, Label and Button Control. (1) Display TextBox content in a Label when the Button is Clicked (2) Display TextBox content in proper case in the Label when the Button is double Clicked
(7)	Develop a Student Login Form with use of RequiredFieldValidator, CompareValidator Controls.
(8)	Develop a form with a Panel Control that shows / hides based on CheckBox.
(9)	Implement an Interactive Registration Form with Validations.
(10)	Use RegularExpressionValidator for email, phone and zipcode validation.
(11)	Write a program to implement two cascading DropDownLists in ASP.NET Web Forms. When a country is selected from the first DropDownList, the second DropDownList should display states related to that country.The list of countries and their corresponding states should be statically populated.
(12)	Write a program to create two ListBoxes. The first ListBox contains available courses. Allow the user to select courses and move them to the second ListBox using ">>" and "<<" buttons.
(13)	Write a program that allows user to enter a new city name in TextBox. When the user clicks "Add" the new city should be added to the DropDownList dynamically.
(14)	Write a program to group three RadioButtons (LENOVO, SONY, PHILIPS) and display the selected name in a Label when a button is clicked.
(15)	Write a program with three RadioButtons (India, US, NewZealand). When user selects one and clicks a button, display related image (or flag) using the Image control.
(16)	Write a program with a TextBox for password input and a CheckBox labelled "Show Password". When checked, change the TextMode of the TextBox from Password to SingleLine.
(17)	WAP to (1) store a message in ViewState and display it (2) store and retrieve any greeting message using Cookies.
(18)	WAP to (1) implement session-based login functionality (2) to implement Session Timeout and display message when expired.
(19)	Demonstrate (1) QueryString to pass name from one page to another (2) the use of hidden fields for data storage
(20)	WAP to (1) retain values on postback using ViewState (2) Create a page to count user

	visits using Application State.
(21)	WAP to (1) save user login status in Session (2) demonstrates how ViewState automatically preserves the value of TextBox across postbacks without any explicit coding for state management.
(22)	Build a shopping cart using Session to store cart items.
(23)	Create a webform which uses QueryString and Session together.
(24)	WAP to demonstrate the use of ViewState to store user preferences (like color / font)
(25)	Create a multi-page application that demonstrates the use of QueryString, Session and Application State.
(26)	Write a program which has a DropDownList for color selection, a Button to set the cookie and a Label to show the retrieved preference.
(27)	Create a webpage where users can select their preferred website theme (“Light Mode” or “Dark Mode”) from a dropdown list. (Use Cookie). When the user revisits the page, show only last selected theme
(28)	Create WebForms (1) Collect Basic Details like name, email, contact (2) Collect Educational Details like HSC Board Name, HSC Passing Month-Year, HSC Percentage (3) Display all collected data from previous pages for review. (Use Session State)
(29)	Create a countdown timer using Session storage.
(30)	Create Login Form. Develop “Remember Me” feature for username using cookies.
(31)	Create a login page that uses Session to track logged-in users.
(32)	Create a connection to a database and display connection status. And also WAP to retrieve and display records using SqlDataReader
(33)	WAP to use GridView to display records from database table and also WAP to populate Country DropDownList and based on country selection – State DropDownList. (Country and State names must be from database tables only)
(34)	WAP to populate ListBox with product names from database and display selected product name to Label.
(35)	WAP to demonstrate using Repeater control to display formatted database data.
(36)	WAP to demonstrate use DataSet to fill data and display in GridView also implement paging.
(37)	WAP to implement login system with user authentication using a database.
(38)	Create a WebForm with Search TextBox. Find out complete record from database according to entered details in Search TextBox.
(39)	Create an ASP .NET application that performs CRUD operations.
(40)	Create an ASP .NET application to display records / data in GridView. (Use Disconnected Architecture).
(41)	Create an ASP .NET application which uses SqlDataSource with parameterized queries.
(42)	Develop a Web Form that shows related data into two GridViews (Master – Detail)
(43)	Develop a Web Form that uses DataView to filter records.
(44)	Create an ASP .NET application that display product data in Repeater with custom template.
(45)	Create an ASP .NET application to register student detail and store to database. (Use Validation wherever required).
(46)	Create an ASP .NET application to retrieve data based on search text. (Use StoredProcedure to get data from Database).

(47)	WAP to display all products in a GridView (Disconnected). Allow the user to select a product from the DataGridView and update its StockQuantity via a separate input field.
(48)	Create a web application in ASP.NET that displays data in a GridView using a connected architecture. Implement sorting and paging functionality for the displayed data.
(49)	Write an ASP .NET application to develop a Master Page. Add Header and Footer to it also add it to multiple content pages.
(50)	Write an ASP .NET application to create a theme with a stylesheet and apply it to webpage using the <Themes> element in web.config.
(51)	Create an ASP .NET page to enable Page Output Caching for 30 seconds and also demonstrate the use of @OutputCache
(52)	Write code for an ASP .NET application to create a theme with different color styles and apply it.
(53)	Create an ASP .NET page to demonstrate Data Caching.
(54)	Develop an ASP .NET Web Form that utilizes full page output caching.
(55)	Develop an ASP.NET Web Form that stores and retrieves a simple string using the HttpContext.Current.Cache object.
(56)	Develop an ASP .NET Web Form that demonstrates explicit removal of an item from the HttpContext.Current.Cache.
(57)	Create an apply two distinct ASP .NET Themes to a web application, configuring one as a default. (can use LinkButtons like “Apply Aqua Theme” and “Apply Forest Theme”)
(58)	Create an ASP .NET application to apply themes. Write skin file code for styling of ASP .NET controls.
(59)	Develop a WebUserControl with output caching and integrate it into a web form to demonstrate fragment caching.
(60)	Develop an ASP .NET Web Form that stores and retrieves a collection of custom objects in HttpContext.Current.Cache with an absolute expiration policy.
(61)	Develop an ASP .NET Web Form that stores and retrieves a collection of custom objects in HttpContext.Current.Cache with a sliding expiration policy.
(62)	Create ASP .NET application which apples Themes with Skin File.
(63)	Create small ASP .NET application to store, search and retrieve student details. (Use Master Page and Themes concept)
(64)	Create a simple login / logout system that integrates with application’s theming.
(65)	Develop a WebUserControl that receives different default styles based on a theme’s skin file.
(66)	Develop an ASP .NET Web Application where a user’s theme change is confirmed via JavaScript before applying it permanently.
(67)	Write an ASP .NET application to (1) read and display XML data (2) writes dataset contents into an XML file.
(68)	Write an ASP .NET Web Form that generates a simple XML file and reads a single configuration value from an XML file and display it.
(69)	Write an ASP .NET code to develop asmx web service that provides a method with text “Hello World”.
(70)	Write an ASP .NET Web Form that displays an application name configured in web.config.

(71)	Write an ASP.NET application which (1) consumes a simple Web Service and display output (2) shows error handling using Web. Config.
(72)	Develop an ASP .NET Web application that (1) reads from connectionStrings and a custom web.config section. (2) reads AppSettings from Web.config and display it in Label.
(73)	Develop a Web Service that returns product details and consume it.
(74)	Write an ASP .NET application which fills DropDownList dynamically. (Use XML Data Only)
(75)	Write an ASP .NET Web Form that demonstrates page-level tracing.
(76)	Develop an ASP .NET Web Application which redirects to a custom error page if any exception occurs.
(77)	Develop an ASP .NET Web Login Form (Use Web.Config – Authentication and Authorization)
(78)	Develop an ASP .NET Web Application for managing list of Employees using XML as the data store. (Consider employee.xml with id, name, designation, salary)
(79)	Write an ASP .NET code which reads and updates XML data dynamically in an ASP .NET application.
(80)	Develop an ASP .NET Web Application with custom error pages for 404, 500 and display basic error info.
(81)	Develop an ASP .NET Web Application with a login, secure user area and a restricted admin area.
(82)	Write an ASP .NET code which uses XmlDataSource to display XML data in a TreeView control.

BCA-6 **CS –37: Machine Learning with Python** **Minimum following exercise should be performed by the students during the semester**	
(1)	Write a Python program/script to make a Pandas DataFrame with two-dimensional list
(2)	Write a Python program to Create a pandas column using for loop
(3)	Write a Python program toChange column names and row indexes in Pandas DataFrame
(4)	Write a Python program to Load different kind of datasets using scikit-learn library
(5)	Write a Python program to Extract the specified rows and columns from the dataset using Pandas
(6)	Write a Python program toHandle missing values using Imputer class with mean strategy
(7)	Write a Python program to Encode categorial data using label encodingtechnique
(8)	Write a Python program toEncode categorial data using one hot encodingtechnique
(9)	Write a Python program to splitting dataset into Training set and Test set
(10)	Write a Python program toPerform feature scaling using standardizationtechnique
(11)	Write a Python program toPerform feature scaling using normalizationtechnique
(12)	Write a Python program toCreate a matrix using numpy and work around
(13)	Write a Python program toPerform mean removal using preprocessing techniques
(14)	Write a Python program toPerform scaling and generate datapoints in a range
(15)	Write a Python program toCreate a vector using binarization technique
(16)	Write a Python program toPerform linear regression using different relationships
(17)	Write a Python program toEvaluate linear regression model using different metrics
(18)	Write a Python program on linear regression model using advertising sales channel data
(19)	Write a Python program toPerform data cleaning processes such as identify null values and outliers
(20)	Write a Python program toGenerate some visualizations to get the detailed insights
(21)	Write a Python program toWorking with heatmap to understand correlation concepts in Machine learning
(22)	Write a Python program toPerforming a summary operation
(23)	Write a Python program toBuilding simple classifier using anyone dataset
(24)	Write a Python program toPerform standard normal distribution using simple classifier
(25)	Write a Python program toBuilding alogistic regression model with use of diabetes datasets
(26)	Write a Python program toEvaluate logistics regression model using accuracy metrics
(27)	Write a Python program toEvaluate a regression model using confusion matrix
(28)	Write a Python program toBuilding a model using Naïve bayes classifier
(29)	Write a Python program toVisualize the training setand test set result (use normalization technique)
(30)	Write a Python program toPredict if cancer is Benign or malignant using SVM algorithm
(31)	Write a Python program toBuild a model using K-means algorithm
(32)	Write a Python program toFind the optimum number of clusters using elbow technique
(33)	Write a Python program toPlot the cluster center using different data points
(34)	Write a Python program toImplement Mean shift clustering algorithm to work with non-parametric clustering
(35)	Write a Python program toUse bandwidth and bin seeding concept to improve mean shift

	clustering algorithm
(36)	Write a Python program toBuild a model with use of agglomerative clustering
(37)	Write a Python program toCreate a linkage matrix using agglomerative clustering algorithm
(38)	Write a Python program toImplement NLTK library and download relevant data
(39)	Write a Python program toImplement stemming concept with using PorterStemmer
(40)	Write a Python program toImplement lemmatization technique to extract the base form of words
(41)	Write a Python program toCreate a chunk parser
(42)	Write a Python program toImplement the structure of sentence
(43)	Write a Python program toEvaluate the grammar using parser
(44)	Write a Python program toGenerate a grammar tree with use of sentence
(45)	Write a Python program toImplement computer vision using OpenCV
(46)	Write a Python program toWork around computer vision relevant python libraries
(47)	Write a Python program toUse of imread(), imshow(), and imwrite()
(48)	Write a Python program toDetect faces from an image using haar-cascade classifier
(49)	Write a Python program toDetecting different objects from a face such as face, eyes
(50)	Write a Python program toDetect a face from a recorded video
(51)	Write a Python program toDetect a face using live streaming