

M.Sc. I.T. Semester II
BIG DATA ANALYTICS (PSIT2P1)

List of Practical

Practical No	Details
1	Install, configure and run Hadoop and HDFS ad explore HDFS.
2	Implement word count / frequency programs using MapReduce
3	Implement an MapReduce program that processes a weather dataset.
4	Implement an application that stores big data in Hbase / MongoDB and manipulate it using R / Python
5	Implement the program in practical 4 using Pig.
6	Configure the Hive and implement the application in Hive.
7	Write a program to illustrate the working of Jaql.
8	Implement the following:
a.	Implement Decision tree classification techniques
b.	Implement SVM classification techniques
9	Solve the following:
a.	REGRESSION MODEL Import a data from web storage. Name the dataset and now do Logistic Regression to find out relation between variables that are affecting the admission of a student in an institute based on his or her GRE score, GPA obtained and rank of the student. Also check the model is fit or not. require (foreign), require(MASS).
b.	MULTIPLE REGRESSION MODEL Apply multiple regressions, if data have a continuous independent variable. Apply on above dataset.
10	Solve the Following:
a.	CLASSIFICATION MODEL a. Install relevant package for classification. b. Choose classifier for classification problem. c. Evaluate the performance of classifier.
b.	CLUSTERING MODEL a. Clustering algorithms for unsupervised classification. b. Plot the cluster data using R visualizations.

M.Sc. I.T. Semester II
MODERN NETWORKING (PSIT2P2)

List of Practical

All practicals are expected to be performed on GNS3/EVE-Ng network Emulator/MININET

Programme Specific Outcome	Simulating Routing –Switching Techniques
Practical No	Details
1	Configure IP SLA Tracking and Path Control Topology
2	Using the AS_PATH Attribute
3	Configuring IBGP and EBGP Sessions, Local Preference, and MED
4	Secure the Management Plane
5	Configure and Verify Path Control Using PBR
6	IP Service Level Agreements and Remote SPAN in a Campus Environment
7	Inter-VLAN Routing
8	Simulating MPLS environment
9	Simulating VRF
10	Simulating SDN with <ul style="list-style-type: none">• OpenDaylight SDN Controller with the Mininet Network Emulator• OFNet SDN network emulator
11	Simulating OpenFlow Using MININET

M.Sc. I.T. Semester II
Microservices Architecture (PSIT2P3)

List of Practical

Practicals can be done with VS2017, VS2019, Visual Code with ASP.NET Core 3.1.x installed along with Docker and Docker Desktop.

Practical No	Details
1	Building ASP.NET Core MVC Application.
2	Building ASP.NET Core REST API.
3	Working with Docker, Docker Commands, Docker Images and Containers
4	Installing software packages on Docker, Working with Docker Volumes and Networks.
5	Working with Docker Swarm.
6	Working with Circle CI for continuous integration.
7	Creating Microservice with ASP.NET Core.
8	Working with Kubernetes.
9	Creating Backing Service with ASP.NET Core.
10	Building real-time Microservice with ASP.NET Core.

M.Sc. I.T. Semester II
IMAGE PROCESSING (PSIT2P4)

List of Practical

All practicals can be done in MATLAB / Scilab / Python

Note:

- 1) Use of built-in functions for matrix operations and mathematical operations are allowed
- 2) Use gray-level and color images or image matrices as input to all programs.

I	Basics
1 a	Program to calculate number of samples required for an image.
b	Program to study the effects of reducing the spatial resolution of a digital image.
c	Program to study the effects of varying the number of intensity levels in a digital image
d	Program to perform image averaging (image addition) for noise reduction.
e	Program to compare images using subtraction for enhancing the difference between images.
f.	Image Registration.
2.	Intensity transformation and Spatial Filtering
	IMAGE ENHANCEMENT
A	Basic Intensity Transformation functions
	<ul style="list-style-type: none"> i. Program to perform Image negation ii. Program to perform threshold on an image. iii. Program to perform Log transformation iv. Power-law transformations v. Piecewise linear transformations <ul style="list-style-type: none"> a. Contrast Stretching b. Gray-level slicing with and without background. c. Bit-plane slicing
B	<ol style="list-style-type: none"> 1. Program to plot the histogram of an image and categorise 2. Program to apply histogram equalization
C	Write a program to perform convolution and correlation
D	Write a program to apply smoothing and sharpening filters on grayscale and color images <ul style="list-style-type: none"> a) Low Pass b) High Pass Note: Use all kernels mentioned in the reference book
3.	Filtering in Frequency Domain
	a) Program to apply Discrete Fourier Transform on an image
	b) Program to apply Low pass and High pass filters in frequency domain
	c) Program to apply Laplacian filter in frequency domain
	d) Note: All other filters can be applied, studied and compared with filters in spatial domain.
	e) Program for high frequency emphasis filtering, high boost and homomorphic filtering.

4.	Image Denoising
	i. Program to denoise using spatial mean, median and adaptive mean filtering
	ii. Program for Image deblurring using inverse, Weiner filters
5.	Color Image Processing
	i. Program to read a color image and segment into RGB planes , histogram of color image
	ii. Program for converting from one color model to another model
	iii. Program to apply false colouring(pseudo) on a gray scale image
6.	Fourier Related Transforms
	Program to compute Discrete Cosine Transforms, Walsh -Hadamard Transforms, Haar Transform , Wavelet
7.	Image compression
	Program to apply compression and decompression algorithm on an image (Arithmetic, Huffman and LZW coding techniques.
8.	Morphological Image Processing
	i. Program to apply erosion, dilation, opening, closing
	ii. Program for detecting boundary of an image
	iii. Program to apply Hit-or-Miss transform
	iv. Program to apply morphological gradient on an image
	v. Program to apply Top-Hat/Bottom-hat Transformations
9.	Image Segmentation
	i. Program for Edge detection using
	a. Sobel, Prewitt, Marr-Hildreth and Canny
	ii. Illustrate Watershed segmentation algorithm
	iii. Any more to be included(to be consulted)
10.	Feature Extraction
	i. Apply Principal components for image description
	ii. Apply Harris-Stephens corner detector algorithm