Ex.No: 1

Discriptive Statistics

The following figures represent the age of these samples of 60 Employees of the firm. Arrange AC Company.

35, 44, 56, 83, 46, 20, 32, 19, 50, 39, 33, 37, 42, 40, 20, 25, 34, 52, 27, 18, 40, 23, 17, 41, 22, 45 21, 34, 49, 27, 60, 46, 32, 58, 23, 52, 24, 64, 41, 47, 54, 37, 40, 41, 40, 36, 46, 29, 34, 39, 39, 40, 37, 50, 41, 34, 47, 34, 45, 36.

1) Display age, capacity, & histogram with Normal curve.
2) Add another variable gender, assign, first 40 employees male & rest as female.
3) Histogram of age male.
4) Histogram of age female.
5) Find out the mean, S.D, median, maximum, minimum & range of age of employees.
6) Display gender using pie-chart with Percentage as a table.

Ex.No: 1

Discriptive Statistics.

Aim:-

To analyze the age distribution of employees in a company using SPSS performing descriptive statistical analysis and visualize the data through histograms and piechart.

Algorithm:-

Step 1: Open SPSS and go to "variable view" and define following variable age & gender (Numeric 1 = Male, 2 = female).

Step 2: Switch to "Data view" and enter the assign data.

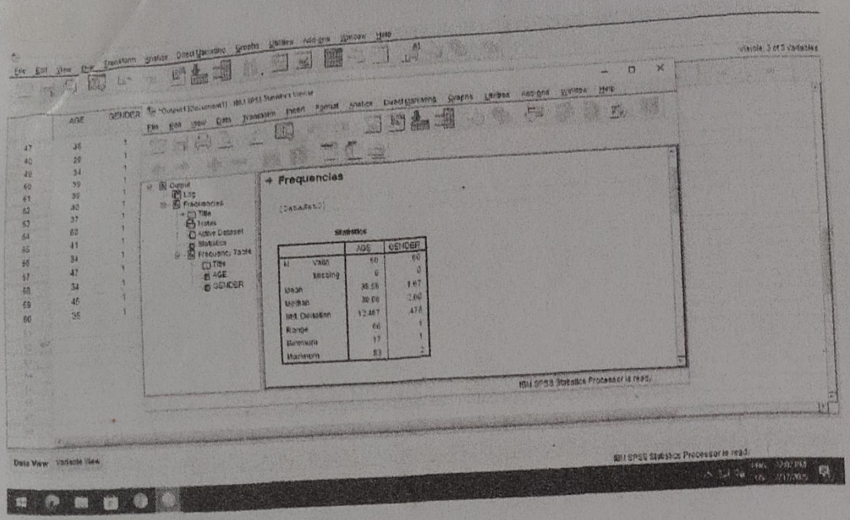
Step 3: Assign the first 40 employees as male 1 and the remaining 20 as female (2)

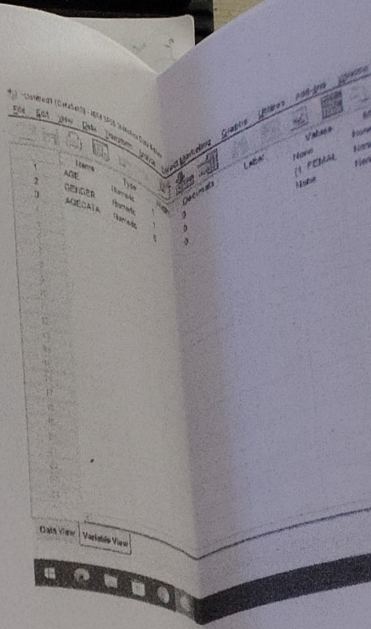
Step 4: Go to Graphs → Legalty Dialogue the variable click ok to generate.

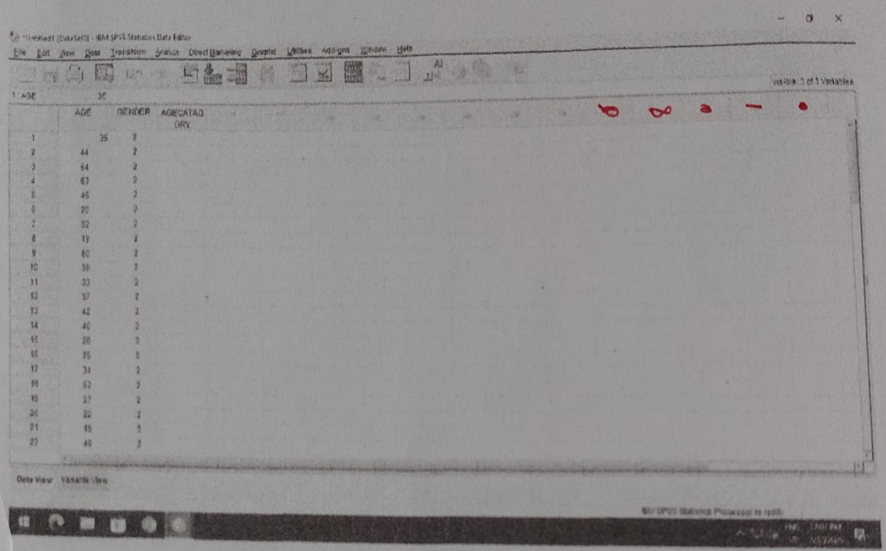
Step 5: Go to Graphs → Legacy Displays → Histograms select age and use gender as filter click ok to genderate separate Histogram

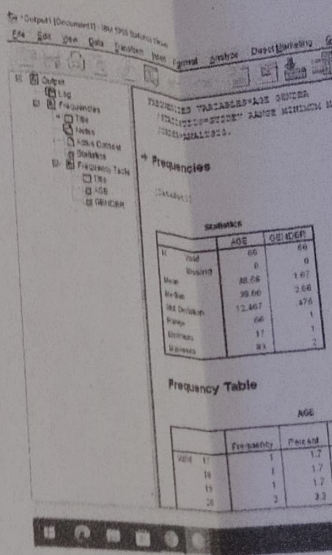
Step 6: Go to analyse → Descriptive → Statistical explore.

Step 7: Move ϕ to dependent list and gender to the factor list and click "ok" to get Mean, SD, Median, Minimum, Maximum & Range.


Frequencies
Statistics
AGE
GENDER
Valid
Missing
Mean
Median
Std. Deviation
Range
Minimum
Maximum






Frequencies
Statistics
Frequency Table

ت. عدلي
14/2

Ex. No: 2

20/02/2025

One-Sample T-Test

The wheel Co., is about to introduce a new line of tyres for racing bicycle by promising 36 km avg running without failure of tyres. Following is a list of how for the 100 bicycles got (to the nearest 100 km) before one of the tyres failed to meet minimum standards. Test whether the bycyle selected by for the study is form wheel co. or not.

38, 24, 12, 36, 41, 40, 45, 41, 40, 47, 26, 15, 48, 44, 29,
43, 28, 29, 37, 10, 37, 45, 29, 31, 23, 49, 41, 47, 41, 42,
61, 40, 40, 45, 37, 55, 47, 42, 28, 28, 38, 48, 18, 16, 39, 50,
14, 52, 33, 38, 51, 10, 49, 21, 44, 31, 43, 34, 49, 48, 28,
39, 28, 39, 28, 36, 16, 56, 54, 39, 31, 35, 36, 32, 20, 54, 39,
31, 35, 36, 32, 20, 54, 25, 39, 44, 25, 42, 50, 22, 9,
34, 32, 34, 42, 40, 43, 32, 30, 51, 20, 29, 14, 19, 38, 46,
46, 39, 40, 47.

Ex. No: 2
06/02/2025

One-Sample T-Test

Aim:-

To Compute one sample t test for given data

Ho: The sample of 100 tyre are not taken from wheels Co. of 36 km avg. running without failure.

H1: The sample of 100 tyre are not taken from wheels Co. of 36 km avg. running without failure.

Procedure:

Step 1: To start SPSS

Start → programs → SPSS for windows → 16.0 SPSS for windows

Step 2: To create a data base.

File → New → Data.

Step 3: Select variable view and create variable kilometer.

Step 4: To begin the one sample T-test.

~~Step 5~~

Analyse → Compare means → one-sample test.

Step 5: The one sample t-test dialogue box appears. Select test variable as kilometer and test value as 36 with 95% confidential interval. To continue choose "ok" button to get the output.

Ex. No: 3.

24/08/2025

Independent Samples T-Test.

A Sample of 25 youth is taken into consideration for studying the cell phone usage. The average monthly minutes spoken by the people are given. check whether there is significant difference in the average monthly minutes of male and female.

monthly minutes	904	801	899	398	625	480	617	817	560
	685	821	797	412					
Gender	M	M	F	F	F	M	F	F	M
	M	F	F	M					
Monthly minutes	601	568	565	613	485	390	617	690	309
	315	553	398						
Gender	M	F	M	M	F	M	M	F	F
	M	F	F						

Ex. No: 3
24/02/2025

Independent Samples T-Test.

AIM

The independent samples T Test compares the mean scores of two groups on a given variable.

H_0: There is no significant difference in the mean monthly minute spoken by male and female.

H_1: There is a significant difference in the mean monthly minute spoken by male and female.

Procedure.

Step 1: Open the SPSS

Step 2: In variable view enter name as monthly minutes and measure scale and create another one as gender also measure as scale.

Step 3: In Data view enter the monthly minutes and denote gender as 1- male, 2- Female.

Step 4: Go to Analysis → Compare means → Independent sample test transfer the average monthly minutes to test variables and grouping variable gender (1 & 2) and click ok.

Ex. No: 4
04/03/2025

Paired Sample T-Test

A health Spa company want to test, whether weight reducing program. has a significant impact on reducing the weight to the participant in the program the data of weight of the participants before and after the weight reducing program as given.

Weight Before	189	202	220	207	197	177	193	202
	208	233						
Weight After	170	179	203	192	172	161	174	187
	186	204						

EX. NO: 04
04/02/2025

Paired Sample T-Test

Aim :-

Paired Sample t-test is a Statistical technique that is used to compare two population ~~before and after~~ the w in the case of two Sample that are correlated.

Ho: There is no significant difference in the weight of the participant before & after the program.

H1: There is a significant difference in the weight of the participant before and after the program.

Procedure :-

Step 1 : Open the database, say AGILITY.

Step 2 : To begin the analysis.

& Analyze → Compared means → paired Sample t-test.

Step 3: Select variable view & enter the given variable and data.

Step 4 :- To begin the Paired sample T-Test.

Analyze → compare means → Paired Sample T-test.

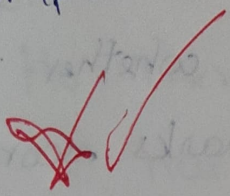
Step 5 :- The paired sample t-test dialogue box appears select pair 1 and 2.

To continue choose 'OK' button to get the output.

~~Output~~ :-

Result :-

Paired Sample T-test was computed successfully.



Ex.No:5

06/03/2025

One way ANOVA using SPSS

Students were given three different drug treatments before revising for their exams. The marks scored by the students in percentage and drugs used are given. Test whether there is significant difference in the marks scored and Drug treatment.

Memory Drug	Place BO	No treatment
70	87	3
77	43	10
83	50	17
90	57	33
97	63	30.

Ex.No: 5
06/03/2025

One way ANOVA using SPSS.

Aim:-

To perform one way ANOVA for given data.

Hypothesis.

Ho: There is no significant difference in the marks scored and drug treatment.

H1: There is significant difference in the marks scored and drug treatment.

Procedure:-

Step 1:- Start SPSS by start → All programs → IBM SPSS Statistics → IBM SPSS Statistics 20

Step 2:- Create two variable named mark scored & assign measure as nominal & variable drug-treatments & assign measure as Scale then give the value of drug-treatment as 1= memory drug 2= place BO. 3= no treatment

Step 3:- Enter data in data view.

Step 4:- Analyse → compare means → one way ANOVA

Step 5:- Then move mark scored to dependent list and drug-treatment to factor → OK

Step 6:- Post hoc → Duncan → Continue → OK.

Result :-

Result :-

One-way ANOVA using SPSS was computed successfully.

Ex.No:6

10/3/2025

Two way Anova Using SPSS

Problem:

The following table represents the number of defective pieces produced by 3 workmen operating in 3 different machines.

	Machine 1	Machine 2	Machine 3
Workman 1	27	34	23
Workman 2	29	32	25
Workman 3	22	30	22

Perform two-way ANOVA to test whether machine and workman have impact on the no. of defective product produced.

Ex. No: 6
10/3/2025

Two way Anova Using SPSS

Aim:-

To perform two-way anova for the given data using SPSS.

Hypothesis :-

H_0: There is no significant differences in the defects for the different combination of workman and machine.

H_1: There is significant difference in the defects for the different combination of workman & machine.

Procedure :-

1) Create workman, machine, number of defects on variable view and set workman value as "workman 1=1", "workman 2=2", "workman 3=3" and Set machine value as "1= machine 1", "2= machine 2" "3= machine 3".

2) Then go to data view and set the value as workman, machine and no. of machine.

3) Select analyze menus → general linear model → univariate

4) Univariate dialogue box → select dependent variable and fixed factor.

5) To click 'ok' to get output.

~~Result~~.

Result :-

Two way ANOVA was successfully computed.

Ex.No:7

Chi-Square Test using SPSS

Problem:-

Use chi-square test relationship between Source of information of product A and experience of the respondent in this work life use in the product. Give your inference.

Source / Experience	Friends relatives	Agent	Ads	Exhibition	Total
Upto 5 years	8	4	23	9	44
6-10	18	4	12	12	46
11-15	3	3	24	12	42
16-20	2	3	6	4	15
21-25	8	3	6	14	31
Above 25	1	1	6	14	22
Total	40	18	77	65	200

Ex.No:7

Chi-Square Test using SPSS

Aim:

To analyze chi-square test for two variables by using SPSS

H_0: There is no significant association in the experience and source of information.

H_1: There is significant association in the experience and source of information.

Procedure:-

Step 1: Open the SPSS.

Step 2: In variable view in source enter the value tables as,

Friends relatives

Agent

Advertisement

Exhibition

Experience.

Enter the value tables as 1 to 5 years, 6 to 10 yrs 11 to 15 yrs, 16 to 20 yrs & 201 to 25 years.

Step 3: Then in data view enter source value according to count value (e.g) count=8, Experience=1 and source=1.

Step 4: Select Data → weight Cases → and transfer the count to frequency variable.

Step 5:- Analyze → Descriptive Statistics → Crosstabs → Experience (Row) → Intermation (Column) → Statistics → chi-square and click ok.

Result:

Result:-

Chi-Square Test using SPSS was computed successfully.

Ex.No:8

A real estate is typically re-acces annually for the porperty tax purpose the assessed value however not necessarily the same as the fair market value of property. The table summarize the value of $30 properties recently sold in mid-western city. Both variable are measured in 1000 IS of dollars.

Property	Sales price	Assesed value	prop-erty	S.P	A.V
1	167.9	152.7	11	230	225.4
2	168	163.8	12	230	170.4
3	155	167.6	13	222.5	200.4
4	158.5	127.3	14	222.5	209.6
5	159.9	155.7	15	220	205.2
6	162	169	16	216	220.9
7	165	189.1	17	215	194.9
8	174.5	153.6	18	228	231.9
9	175	167.1	19	209	224.2
10	159	148.9	20	267	235.1

Ex.No:8 Correlation and Regression Analysis using SPSS

AIM:-

To carryout correlation analysis to find our relationship between two variable using SPSS

Ho: There is no significance relationship between sales price and assessed value

H1: There is significant relationship between Sales price assessed value.

Algorithm:

Step 1: To start SPSS start → program → spss window → 16.0 SPSS for windows.

Step 2: Enter two variable sales prices and assessed value in data view.

Step 3: Enter the sales price and assessed value in variable view.

Step 4: Next click on Analyse → Descriptive → Frequency → charts → Histograms → click on continue and press ok.

Step 5: After click on Analyse → correlate → Bivariate (Here it is regarding relationship. So choose correlation.

Result:-

Correlation and regression analysis using SPSS was computed successfully.

Ex.No: Ex.No:9

Multiple Regression Analysis

Multiple Regression Analysis.

Aim:

To carryout regression analysis to find out the relationship among variables using SPSS.

Procedure:

Step1: To start SPSS, Start → programs → SPSS for windows → 16.0 SPSS for windows.

Step2: Enter two variables sales price and assessed value in data view.

Step3: Enter the Dose, Blood pressure and recovery time in variable view

Step4: Next click on Analyze → Regression → linear → Dependent & Independent variable → OK.

Step5: Graph → Legacy Dialogs → Scatter/Dot → Choose simple scatter → Define → Fill x & Y Axis → To click 'ok' to get outpu

Result:

Thus the multiple regressions have been computed succesfully.

EX.NO : 10

Kruskal - Wallis Test

Aim:

To find out the machine values using the Kruskal - wallis test analysis.

Procedure:-

Step 1:- Start → All programs → IBM SPSS → File → New → Data

Step 2: Select variable view → Create variables.

Step 3: Select Data view → Enter data in the Data view.

Step 4:- Select Analyze Menu → Non-parametric test → Legacy Dialogs → K Independent Sample Test

Step 5 :- K Independent Sample Test Dialogu Box → Select test variable and grouping variable.

Step 6 :- Mention maximum and minimum limit in Define Groups option.

Step 7: Click 'options' → Select Descriptive → Continue.

Step 8: Select Test type " Kruskal - wallis H Test → To click 'ok' to get the output.

Mann Whitney Test.

Aim:-

To find out the bounced cheque using the mann-whitney test.

Procedure:-

Step 1: Start → All programs → IBM SPSS → File → New → Data.

Step 2: Select variable view → create variables.

Step 3: Select data view → enter data in the data view.

Step 4: Select Analyse menu → non parametric test → legacy dialogs → 2 Independent Samples.

Step 5: 2 Independent samples dialog box → Select test variable and grouping.

Step 6: Mention maximum and minimum limit in define groups option.

Step 7: Click options → select descriptive → continue.

Step 8: Select test type "Mann whitney U Test → To click ok to get the output.

Result:-

Mann whitney U-Test is successful.

Ex.No:12

Wilcoxon Signed Rank test.

Aim:-

Create before training & after training analysis it with in wilcoxon signed rank test using SPSS.

Procedure:

Step 1: Start → all programs → IBM SPSS → File → New → Data.

Step 2: Select variable view → create variables.

Step 3: Select data view → enter data in the data view.

Step 4: Select analyse menu → non-parametric test → legacy dialogs → 2 related samples.

Step 5: 2 related samples Dialog Box → Select test variables.

Step 6: click options → select descriptives → continue

Step 7: Select Test type wilcoxon → To click ok to get the output.

Result:

Mean ran devel on before and after training values are found by using for the wilcoxon method.

Ex.No:13

Investment Appraisal using Excel.

A small wonders ltd is a small manufacturing of micro computers the board of directors of the firm is fixed with the problem of evaluating four proposals & deciding which if any of the alternatives are acceptable the table shows the proje & available capital (₹5000) over the next four years cash in flows are show in positive cash outflows are show interrogati & cost of capital is assumed as 15%. P/A.

Proposal	year 1	year 2	year 3	year 4
1	-60	0	40	70
2	-50	-30	50	1000
3	-40	-80	100	90
4	-35	110	-50	
Capital available for year	100	100	50	50

You are requested to choose any one rank preposition based on NPV.

Ex. No: 13

Investment Appraisal using Excel.

Aim:

To find NPV for different proposals and rank the investment proposal.

Procedure:

Step 1: Start all programs → ms office → MS Excel.

Step 2: Open sheet 1 → enter the column A value for (proptional cost of capital, year 1, year 2, year 3, year 4) enter values entered.

Step 3: Find the NPV value using formula (=npv(b1, b2, b3, b4, b5, b6) :→ click enter.

Step 4 :- See the NPV value to select the all amount click left mouse button goto format cells.

Step 5: Currency go to symbols select INR ok.

Step6: Discover the rank for all NPV value

Step7: Select b8(=rank (select NPV values) select ~~step 7~~: ~~Select~~ ascending or descending varible.

Step 8:- Find the output.

Result:

Investment appraisal has been ranked using MS Excel.

Ex.No:14

Calculation of Interest rate for the Loan.

A person avail a loan of Rs. 1 lakh, that is to be repaid in 48 monthly installments of Rs. 3000 each. Find the rate of interest charged on the loan.

Ex.No:14. Calculation of Interest rate for the loan.

Aim:

A Calculate interest rate for the ~~long~~ loan using excel

Procedure:

1) Create loans as first cell and put values as 1 Lakh.
2) Create no. of periods as 2nd cell and value as 98
3) Create EMI as 3rd cell and put value as 3000
4) Go to formula function → insert function → Select → financial → Select RATE.
5) Assign nper as 48. pmt as -3000 pv as 1 lakh.
6) Click ok.
7) Right click the answer → format cell → percentage → ok.
8) In the fifth row, type = A4*12.
9) The output will appear.

Result:-

Interest rate for the loan is calculated for the given data.

Ex. No: 15 Calculation of Internal rate of Return (IRR) using Excel.

Assume that the initial investment of 1,00,000 results in 12 annual cash flow as given below.

1320	1500	1300	-	1240	1600	1400
0	0	0	2000	0	0	0
1645	1769	1769	1655	1650	1220	
0	0	0	0	0	0	

Calculate Internal rate of Return (IRR).

Ex.No:15 Calculation of IRR using Excel.

Aim:

To calculate internal rate of return using excel.

Procedure:-

1) Type initial investment as -1,00,000.
2) Set values for income 1, 2, ..., 12 as, 13200, 15000, ..., 12000 respectively
3) Click formulas → insert functions → financial → IRR.
4) Set values from B1 to B13
5) Click OK
6) The output will appear.

Result:-

Internal rate of return has been calculated for the given data.

Ex.No:16

Calculation of EMI Using Excel.

A person get a loan from the bank of Rs. 200000 at annual interest rate of 14% the loan has to be repaid in 15 years in equally monthly installments find out EMI?

Ex. No: 16. Calculation of EMI Using Excel.

Aim

To Calculate the EMI for the given problem.

Procedure.

1) Start - all programs - Microsoft office Excel
2) Sheet one under the column A1 create loan and A2 rate, A3 no. of years.
3) Enter the values 2000, 0.14/12 and 15 in cells B_1, B_2 and B_3 respectively.
   i) As,
   ii. Loan - INR 200000
   iii. Rate - 14%
   iv. No. of years 15.
4) Go to insert function → choose financial → PMT → then type variables → ok → the result will appear.

Result:-

Calculation of the EMI using excel for the given problem has been performed successfully.

Ex. No: 17 Calculation of Compound interest using Excel.

You deposit Rs. 1000 each and every month in your bank account. The bank pays 12% annual rate that is compound every month. Find out how much money will be in your account at the end of 24 months.

Ex. No: 17

Calculation of Compound Interest using Excel.

Aim

To perform compound interest for the given information using excel.

Procedure :-

1) Start → All program → MS office → MS Excel.
2) Type number of periods, Monthly payment and interest rate on A_1, A_2 and A_3 resp.
3) Type 24,1000 and 0.12/12 on B_1, B_2 and B_3.
4) Click → Formula tap → Insert Function → choose financial and select FV function.

Result :-

Thus the compound interest for the given information has been completed successfully.

EX. NO: 18 Solving LPP by Graphical and Simplex method.

Aim:-

To solve Linear programming graphical & Simplex method problem using TORA.

Procedure:-

1) Start → run → TORA
2) Select linear programming from main menu.
3) Click "GOTO INPUT SCREEN".
4) Give problem title number of variables and
5) no. of constraints then press ENTER.
5) Give problem fill input grid by using following data object function.
6) Max $z = 6x_1 + 4x_2$
7) Constraints = $6x_1 + 4x_2 = 24$
8) $x_1 + 2x_2 = 6$
9) For Graphical method click solve menu → Solve problem → graphical.
10) For final solution click solves menu → Solve problem → algebraic → final solution.
11) For specific method of solving choose any one of M Method, 2-phase method etc.,
12) Then write the solution and close TORA.

Result:-

Thus the solution for the given LPP is solved by Graphical and Simplex method using TORA.

EX.NO:19

Transportation Problem.

Aim:-

To solve the transportation problem to determine the optimum cost.

Procedure:-

1) Start
2) Click on Start Button → All programs → TORA.
3) Go to main menu and select transportation problem.
4) Select name and the number of source and destination for given problem
5) Enter the given information.

Result:-

Thus the transportation problem has been solved succesfully.

Ex. No: 20

Assignment problem using TORA.

Aim:

To perform solving assignment for the given data.

Procedure:-

1) Select → All program → TORA
2) Select 'click here at start'.
3) Select Transportation model.
4) Enter title and input 3 for no. of destination & no. of sources.
5) Press TAB button input Grid → Transportation page will appear. Input the data in respective box.
6) Assign 1 for supply and demand for all operator and job.
7) Click solve menu. Save the problem.
8) Select solve problem → Final Solution.
9) output will appear.

Result:-

The assignment problem has been performed successfully.

EX.NO:21

Assignment problem using POM.

Aim:-

To find out optimum solution for assignment problem using POM.

Procedure:-

1) Start → POM.
2) Select Module from Main menu of Assignment
3) Give the 'Number of objects to be filled.
4) Fill input Grid using the following data:

	A	B	C	D
1	10	25	15	20
2	15	30	5	15
3	35	20	12	24
4	M	25	24	20

5) ~~Solve~~ select solve problem

Result:-

Thus the solution for the assignment problem is derived.

Ex.No:22 Critical Path Method.

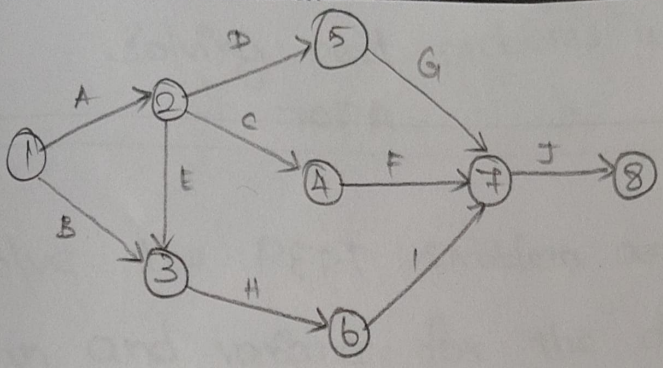
Aim:-

To find out the critical path for the given project using TORA.

Procedure:-

1) Start
2) Click on Start Button → Allprograms → TORA.
3) Go to main menu and select project planning and CPM - critical path method. Enter the values of the network problem.

Activity	Description	Required Predecessor	Duration (year).
A	product design	(None)	1
B	Market research	(None)	1
C	Production analysis	A	2
D	Product model	A	3
E	Sales brochure	A	2
F	Cost analysis	C	3
G	product testing	D	4
H	Sales training	B, E	2
I	Pricing	H	1
J	project report	F, G, I	1



6) Now select SOLVE MENU and GO TO OUTPUT SCREEN. There are two options for output, Select CPM Calculations

7) For step-by-step calculation of earliest time and latest time using forward pass and backward pass procedure click NEXT STEP button. To get all the value instantly, then press ALL STEPS button.

8) The screen gives all the required values to analyse the problem. You may note that at the bottom of the table, the critical activities are highlighted in red colour.

9) Close the presentation

10) Stop.

Result:-

In the graph red coloured graph shows the critical path for the given problem.

Ex.No: 23 Solving pert problems using TORA.

Aim:-

To solve the PERT problem and find out the mean and variance for the different activity.

Procedure:-

1) Start
2) Click on Start Button → All programs → TORA.
3) Go to main menu and select project planning and PERT. Enter the values of the network problem such as activity starting and ending node and optimistic, most likely and pessimistic time.

	1-2	1-3	2-5	3-4	4-5	5-8	4-6	4-7
A	3	1	6	8	0	5	6	3
M	5	2	8	12	0	7	9	6
B	7	3	12	17	0	9	12	8

	6-9	8-9	7-10	9-10
A	1	3	8	2
M	2	5	15	5
B	3	8	20	6

4) Now select solve MENU and GOTO OUTPUT SCREEN. There are two options for output, select PERT Calculation
5) To calculate mean and variance select activity mean/var

6) The screen gives all required values to analyse problem

7) close the presentation

8) Stop.

Result:-

Thus the mean and variance for the different activities & critical path has been calculated using TORA.

Ex. No :- 24

Queing Model using TORA (M/M/1)

Aim :-

To find out the probability of customer in the system and also having LS, LQ, WS, WQ

Sum :-

The arrival rate customer and banking customer follows passion distribution with the mean of 45/hr, the service rate of ~~customer~~ counter clerk follows passion distribution with the mean of 60/hr.

A. What is probability of having 0 customer in the system (po)?

B - what is the probability of having 5 customer in the system (p5)?

C. What is probability of having 10 customer

D - Find the LS, LQ, WS, WQ.

LS - average number of customer in a server

LQ - average number of in query.

WS - average time customer spend in analysis.

WQ - average time customer in a query.

Procedure :-

1) Start → all programs → TORA.
2) Click → Click here → queing analysis. Step.
3) Open a box & click go to input screen
4) Types the problem title & no. of session
5) Press 'tab' key on key board → then open

for input table → enter the values.

6) click solve menu → save to your holder

7) click solve problem → go to output screen option as session.

8) End program.

Result:-

The program was executed.

Exp. No: 5

Queing Model using TORA (M/M/N)

Aim:

To find out the probability of during 'N' number of customer in the system and also is calculate LS, LQ, WS, WQ queuing using TORA (M/M/N).

Procedure:-

1) Start → all programs → TORA.
2) Mein menu will appear → select the quening analysis menu → select input grid column → click go to input screen.
3) Enter the program title and enter the no. of scansions then click to tab button.
4) Input table will appear enter the lambda value and M value "enter the number" scansions.
5) Click solve menu save the data → then click solve problem (modify input data).
6) Then go to output screen box will appear → click go to screen.
7) Select output option → select scenario then output will appear.
8) End of the program.

Result:-

The Queuing theory problem solved by TORA & executed successfully.

Exp. No: 26

Network Model - Shortest Route.

Aim

To find out the shortest route between nodes for the even network diagram.

Procedure :-

1) Open TORA.
2) Main menu → network models → Shortest route.
3) Go to Input Screen.
4) Enter the problem title → Solve menu → Solve problem → Shortest route.
5) Go to output screen → click here to list all routes
6) Display the results.

Result :-

The shortest route between nodes for the even network diagram is calculated.

Ex. No: 27 Network Model - Minimum Spanning Tree.

Aim:

To find out the minimum spanning length for the given network diagram.

Procedure:-

1) Open TORA.
2) main menu → networking model → minimal spanning tree → go to input screen
3) Enter the problem title → enter the no. of node → select tab.
4) Enter the node name → column (or) row → enter the node values and column values (or) row values.
5) Select solve menu → select save → solve the problem → go to output screen
6) Click all iterations → select ok → display the result.

Result:-

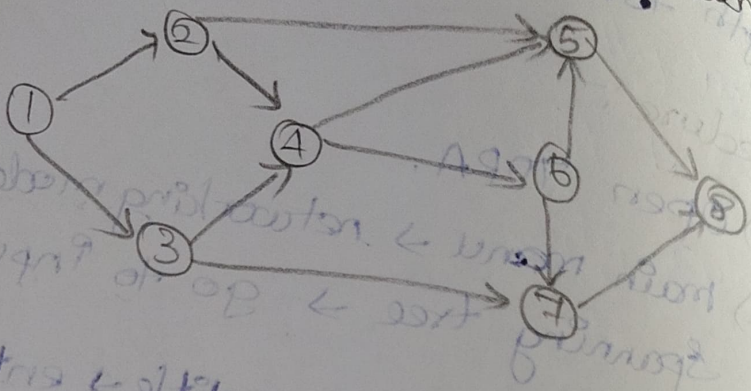
The minimum spanning length for the given network diagram is running successfully.

Ex. No: 28

Network Model - Maximum flow.

Problem:

Maximal flow Problem.



Ex. No: 28

Network Model - Maximum flow.

Aim:

To find out the maximum flow between nodes for the even network diagram.

Procedure:

1) Open TORA
2) Main menu → network models → maximal flow.
3) Go to input screen → enter the problem title & no. of nodes → click tab.
4) Enter the all nodes values for node 1 to node 8 → Solve menu → save.
5) Solve problem → go to output screen → select output for maximum flocos.
6) See the results.

Result:-

The maximum flow from the node 1 to node 8 is find out Succesfully.

Ex. No 29

Portfolio Management Using Excel.

Problem :-

Eby Abraham has recently inherited some money which he would like to invest in stock. Eby already holds stock in Company A, and over the past ten years he has received an average annual return of 7.48% on his investment. He would like to increase this and hence informed his investment banker that an annual return of at least 12% is his desired objective. The bank's funds investment C, whose stock performances meet Edby's requirements ?

Company	1	2	3	4	5	6	7	8	9	10
A	8.5	15.3	11.5	-1.6	-3.6	8.4	6.8	11.9	6.1	11.5
B	6.7	9.2	11.3	17.7	7.4	13	11.5	15.1	19.4	15.2
C	15.1	27.8	38.6	-12	5.6	12.7	-2.1	12.8	36.8	22.7

Ex. No: 29

Portfolio Management using Excel.

Aim

To identify the better portfolio for the investment using Excel.

Procedure:-

1) Start → all programs → MS office → MS Excel.

Enter the data given in table.

To find the average return received from each portfolio by clicking → formulae → insert function → choose AVERAGE function and select the reference. (=Average(E7:M7)

To find the standard deviation received from each portfolio by clicking → formulae → insert function → choose STDEV function and select the reference. (=STDEV(E7:N7))

Choose the portfolio which has more average return and less standard deviation.

Result:-

Portfolio analysis for the given data performed successfully.