KONGUNADU

ARTS AND SCIENCE COLLEGE

(Autonomous)

Re-accredited by NAAC with 'A+' Grade (4th Cycle)

College of Excellence (UGC)

31st Rank among Colleges in NIRF 2023

G. N. Mills (Post), Coimbatore - 641 029

www.kongunaducollege.ac.in

Estd 1973

DEPARTMENT OF MATHEMATICS

Supported by DBT STAR College Scheme

1973-2023

Golden Jubilee

LAB MANUAL

B.Sc MATHEMATICS

Skill Based Subject

Fundamentals of LaTeX - Practical

2022-2023

KONGUNADU

ARTS AND SCIENCE COLLEGE

(Autonomous)

Re-accredited by NAAC with 'A+' Grade (4th Cycle)

College of Excellence (UGC)

31st Rank among Colleges in NIRF 2023

G. N. Mills (Post), Coimbatore - 641 029

www.kongunaducollege.ac.in

Estd 1973

DEPARTMENT OF MATHEMATICS

Supported by DBT STAR College Scheme

1973-2023

Golden Jubilee

LAB MANUAL

B.Sc MATHEMATICS

Skill Based Subject

Fundamentals of LaTeX - Practical

2022-2023

LaTeX Lab Manual

Contents

1 INTRODUCTION

LATEX is a typesetting program and is an extension of the original program TEX written by Donald Knuth. Every LaTeX document must contain the following three components:

```
\documentclass{article}
\begin{document}
\end{document}
```

In general, required information is included in LaTeX commands in braces . while optional information is included in square brackets []. The default command must appear at the very beginning font size for each class is 10 point. The

```
\documentclass
```

The command

```
\pagestyle
```

```
\pagestyle{plain}
\pagestyle{empty}
\pagestyle{headings}
\pagestyle{myheadings}
```

Remember that the preamble refers to any commands between the

```
\documentclass
```

2 BULLETS AND NUMBERING

Question

Using LaTex environment, type the following text

(a) Numbering 1

- Bullet 1
- Bullet 2

(b) Numbering 2

i. Type 3

Coding

```
\documentclass{article}
\usepackage{amsmath,enumerate}
\begin{document}
\begin{enumerate}
\item Numbering 1
\begin{itemize}
\item Bullet 1
\item Bullet 2
\end{itemize}
\item Numbering 2
\begin{enumerate}
\item Type 3
\end{enumerate}
\end{enumerate}
\end{document}
```

Output

1. Numbering 1
   - Bullet 1
   - Bullet 2
2. Numbering 2
   (a) Type 3

3 SECTIONS

Question

Using LaTex environment type the following text including sections.

1 Modern Algebra

1.1 Group

1.1.1 Subgroup

1.2 Ring

1.2.1 Homomorphism

Coding

```
\documentclass{article}
\usepackage{amsmath,enumerate}
\begin{document}
\section{Modern Algebra}
\subsection{Groups}
\subsubsection{Subgroup}
\subsection{Ring}
\subsubsection{Homomorphism}
\end{document}
```

Output

1 Modern Algebra

1.1 Groups

1.1.1 Subgroup

1.2 Ring

1.2.1 Homomorphism

4 EQUATION

Question

Using LaTex, type the following equation

$$\sqrt{\sqrt{n!+\sqrt{45}}}+\int\limits_0^x \int\limits_{\sqrt{\sqrt{16}}}^x \sqrt{\sqrt{e^x}}dx+\frac{d^2y}{dx^2}$$

Coding

```
\documentclass[12pt]{article}
\usepackage{amsmath,amsthm,amsfonts}
\begin{document}
$$ \sqrt{\sqrt{n!+{\sqrt{45}}}}+ \int\limits_0^x
\int\limits_{\sqrt{\sqrt{16}}}^x \sqrt{\sqrt{e^x}} dx + \frac{d^2y}{dx^2}$$
\end{document}
```

Output

$$\sqrt{\sqrt{n!+\sqrt{45}}}+\int\limits_0^x \int\limits_{\sqrt{\sqrt{16}}}^x \sqrt{\sqrt{e^x}}dx+\frac{d^2y}{dx^2}$$

5 LETTER - EDUCATIONAL TOUR

Question

Using LaTex, prepare a letter to get permission from the Secretary, Kongunadu Arts and Science College, Coimbatore - 641 029 for organizing the educational tour through proper channel.

Coding

```
\documentclass[12pt]{article}
\textheight 9.00in
\textwidth 6.00in
\leftmargin 0.10in
\rightmargin 0.10in
\topmargin 0.10in
\evensidemargin 0.10in
\oddsidemargin 0.10in
\headsep 0.5in
\parskip=0.05in
\pagestyle{empty}
\begin{document}
\begin{flushright}
\textsf{Coimbatore,\\ 09-03-2022.}
\end{flushright}
\textsf {From\\
\indent S.Mythili(191MA001),\\
\indent III-B.Sc.,Mathematics,\\
\indent Department of Mathematics(Aided),\\
\indent Kongunadu Arts and Science College(Autonomous),\\
\indent Coimbatore - 641 029.}\\\\
\textsf {To\\
\indent The Secretary,\\
\indent Kongunadu Arts and Science College(Autonomous),\\
\indent Coimbatore 641 029.}\\\\
\textsf {Through proper channel,}\\\\
\textsf {Respected Madam,}\\\\
\textsf{Sub:Requisition for Educational tour-Reg}\\
\indent \textsf{We kindly state that, we planned for an Educational Tour to
```

```
Mysore and Bangalore from 01.04.2022 to 03.04.2022. In this regard, we
request you to kindly grant us the permission for the same; also, we request
some of our faculty members to accompany with us. Kindly do the needful.}
\begin{center}
\textsf {Thanking you,}
\end{center}
\hfill \textsf {Yours faithfully,}
\begin{flushright}
\hfill\textsf {(S.Mythili.)}
\end{flushright}
\end{document}
```

Output:

Coimbatore,
09-03-2022.

From
S.Mythili(191MA001),
III-B.Sc.,Mathematics,
Department of Mathematics(Aided),
Kongunadu Arts and Science College(Autonomous),
Coimbatore - 641 029.

To
The Secretary,
Kongunadu Arts and Science College(Autonomous),
Coimbatore 641 029.

Through proper channel,

Respected Madam,

Sub:Requisition for Educational tour-Reg

We kindly state that, we planned for an Educational Tour to Mysore and Bangalore from 01.04.2022 to 03.04.2022. In this regard, we request you to kindly grant us the permission for the same; also, we request some of our faculty members to accompany with us. Kindly do the needful.

Thanking you,

Yours faithfully,

(S.Mythili.)

6 CURRICULUM VITAE

Question

Using LaTex, type your own Curriculum Vitae.

Coding

```
\documentclass[12pt,a4paper,roman]{moderncv}
\moderncvstyle{classic}
\moderncvcolor{blue}
\usepackage[utf8]{inputenc}
\usepackage[scale=.75]{geometry}
\name{Mythili}{Selvakumar}
\address{34 C,Maniyakarrar Thottam}{Itteri Street\\ Udayampalayam\\}{
Coimbatore 641049}
\phone[mobile]{8903510480}
\email{mythiliskumar2002@gmail.com}
\social[twitter]{Mythili@12}
\photo[80pt][0.4pt]{mythili.jpg}
\begin{document}
\makecvtitle
\section{Education}
\cventry{2019--present}{Bachelor of Science in Mathematics}{Kongunadu
Arts and Science College}{Coimbatore}{}{Percentage- 96(upto 5 semesters)}
\cventry{2018--2019}{Higher secondary-Second year}{Vimal Jyothi Convent
Matriculation higher secondary school}{Coimbatore}{}{Percentage- 94.1}
\cventry{2017--2018}{Higher secondary-First year}{Vimal Jyothi Convent
Matriculation higher secondary school}{Coimbatore}{}{Percentage- 87}
\cventry{2016--2017}{SSLC}{Vimal Jyothi Convent Matriculation higher
secondary school}{Coimbatore}{}{Percentage- 97}

\section{Carrier Objective}
{To work for an organization which provides me the opportunity to improve my
skills and knowledge to grow along with the organization objective.}
\section{Internships}
Two days online Course on Computational tools in Applied
Mathematics and Engineering
\section{Projects}
```

```
{Sentiment Analysis}\\
\\The project aims in finding out the sentiment of the tweets in Sports domain
and finding out the ratio in the sports liked by thepeople.\\ \\
{Stock Analysis}\\
{\\This project aims in Analysing
the stock movement in Dr. Reddy's stock by using Technical Analysis,
Fundamental Analysis, and CANSLIM Approach\\}
\section{Computer Skills}
\cvitem{Microsoft Office}{Word, Excel, Powerpoint, Publisher}
\cvitem{Languages}{C,C++,R,Python}
\section{Certifications}
\begin{itemize}
\item Diploma in Vedic Mathematics
\item Developing Softskills and Personality
\item Basics of R
\end{itemize}
\section{Extra-Curirrucular}
\begin{itemize}
\item NSS Volunteer
\item Participated in the "Two Weeks online course on
Applied tools in Mathematics" as a part of Internship
\item Participated in three days Vedic Mathematics
Programme organized by SSUN Tamilnadu
\end{itemize}
\section{Personal Traits}
\begin{itemize}
\item Able to grasp and learn new things quickly
\item Highly motivated and eager to learn new things.
\item Strong motivational and leadership skills.
\item Ability to work as an individual as well as in group.
\end{itemize}
\section{References}
\begin{cvcolumns}
\cvcolumn{Person}
{\begin{itemize}
\item Dr.M. Vivekprabhu \\
\end{itemize}}
\cvcolumn{Email}
{\begin{itemize}
\item vivekprabhum@kongunaducollege.ac.in.
```

```
\end{itemize}}
\end{cvcolumns}
\end{document}
```

Output:

Mythili Selvakumar

34 C,Maniyakarar Thottam
Iiteri Street
Udayampalayam
Coimbatore 641049
8903510480
mythiliskumar2002@gmail.com
Mythili912

Education

2019–present **Bachelor of Science in Mathematics**, *Kongunadu Arts and Science College*, Coimbatore
Percentage- 96(upto 5 semesters)

2018–2019 **Higher secondary-Second year**, *Vimal Jyothi Convent Matriculation higher secondary school*, Coimbatore
Percentage- 94.1

2017–2018 **Higher secondary-First year**, *Vimal Jyothi Convent Matriculation higher secondary school*, Coimbatore
Percentage- 87

2016–2017 **SSLC**, *Vimal Jyothi Convent Matriculation higher secondary school*, Coimbatore
Percentage- 97

Carrier Objective

To work for an organization which provides me the opportunity to improve my skills and knowledge to grow along with the organization objective.

Internships

Two days online Course on Computational tools in Applied Mathematics and Engineering

Projects

Sentiment Analysis

The project aims in finding out the sentiment of the tweets in Sports domain and finding out the ratio in the sports liked by the people.

Stock Analysis

This project aims in Analysing the stock movement in Dr.Reddys stock by using Technical Analysis, Fundamental Analysis, and CANSLIM Approach

Computer Skills

Microsoft Office	Word, Excel, Powerpoint, Publisher
Languages	C,C++,R,Python

Certifications

- Diploma in Vedic Mathematics
- Developing Softskills and Personality
- Basics of R

Extra-Curirrucular

- NSS Volunteer
- Participated in the 'Two Weeks online course on Applied tools in Mathematics' as a part of Internship
- Participated in three days Vedic Mathematics Programme organized by SSUN Tamilnadu

Personal Traits

- Able to grasp and learn new things quickly
- Highly motivated and eager to learn new things.
- Strong motivational and leadership skills.
- Ability to work as an individual as well as in group.

References

Person	Email
Dr.M. Vivekprabhu	vivekprabhum@kongunaducollege.ac.in.

7 QUESTION PAPER

Question

Using LaTex, type a question paper for the subject Modern Algebra as per the following pattern.

Kongunadu Arts and Science College(Autonomous)
Coimbatore – 641 029
Department of Mathematics

CIA TEST-II

Class&Major	III B.Sc. Mathematics
Title of the paper:	Modern Algebra
Date&Session:	DD/MM/YYYY 2.00-5.00pm AN
Time:3 hrs	Max.Marks:75

Answer ALL Questions

SECTION-A(10×1=10 Marks)

Choose the correct answer

1.

a) b) c) d)

SECTION-B(5×5=25 Marks)

11. a)

(*or*)

b)

SECTION-C(5×8=40 Marks)

16. a)

(*or*)

b)

Coding

```
\documentclass[12pt]{article}
\usepackage{amsmath,amsthm,amsfonts,enumerate}
 \begin{document}
\begin{center}
 {Kongunadu~Arts~and~Science~College(Autonomous)}\\ Coimbatore { 641
029\\
Department~of~Mathematics\\
\vspace{0.1in} CIA TEST-II\\
\framebox[5in]{Class\&Major\hfill III B.Sc. Mathematics}
\framebox[5in]{Title of the paper:\hfill Modern Algebra}
\framebox[5in]{Date\&Session: \hfill DD/MM/YYYY 2.00-5.00pm AN}
\framebox[5in]{Time:3 hrs\hfill Max.Marks:75} Answer ALL Questions\\
\text{SECTION-A(10$\times$1=10 Marks)}\\
\end{center}
Choose the correct answer\\
$1.$Two numbers are said to be relatively prime when,\\
a) (a,b)=$1$ \ b) a=b \ c) [a,b]=$1$ \ d) a$\neq$ b
\begin{center}
\text{SECTION-B(5$\times$5=25 Marks)}\\
\end{center}
$11.$ a) Define Ring with examples.
$$(or)$$
b) Define Homomorphism and Kernal.
\begin{center}
\text{SECTION-C(5$\times$8=40 Marks)}\\
\end{center}
$16.$ a) Explain the Fundamental theorem of Homomorphism.
$$(or)$$
b) Explain Cauchy's theorem for Abelian group.
\end{document}
```

Output

Kongunadu Arts and Science College(Autonomous)
Coimbatore - 641 029
Department of Mathematics

CIA TEST-II

Class&Major	III B.Sc. Mathematics
Title of the paper:	Modern Algebra
Date&Session:	DD/MM/YYYY 2.00-5.00pm AN
Time:3 hrs	Max.Marks:75

Answer ALL Questions

SECTION-A(10×1=10 Marks)

Choose the correct answer

1.Two numbers are said to be relatively prime when,

a) (a,b)=1 b) a=b c) [a,b]=1 d) a≠ b

SECTION-B(5×5=25 Marks)

11. a) Define Ring with examples.

(*or*)

b) Define Homomorphism and Kernal.

SECTION-C(5×8=40 Marks)

16. a) Explain the Fundamental theorem of Homomorphism.

(*or*)

b) Explain Cauchy's theorem for Abelian group.

8 TABLE

Question

Using LaTex, type the following table.

	Item	Budget			Total
		1^{st}Year	2^{nd}Year	3^{rd}Year	(in Rupees)
A	Recurring	JRF	JRF	SRF	
1	Salaries/Wages	1,65,600	1,65,600	1,93,200	5,24,400
2	Consumables	50,000	50,000	50,000	1,50,000
3	Travel	75,000	75,000	75,000	2,25,000
4	Other costs				
(i)	Books/Journals	75,000	75,000	75,000	2,25,000
(i i)	Contingency	50,000	50,000	50,000	1,50,000
B	Equipments	1,50,000	-	-	1,50,000
	Grand Total (A+B)				14,24,400
	Total FEC*				NIL
	over head charge (20% of the grand total)				2,84,880
	Total				17,09,280

Coding

```
\documentclass[12pt]{article}
\usepackage{amsmath, amsthm,amsfonts,enumerate}
\begin{document}
\begin{tabular}{|c|c|c|c|c|c|}
\hline
&Item &\multicolumn{3}{c|}{Budget} &Total\\
\hline
&&$1^{st}$Year &$2^{nd}$Year &$3^{rd}$Year &(in Rupees)\\
\hline
A &Recurring &JRF &JRF &SRF &\\
\hline
1 &Salaries/Wages &1,65,600 &1,65,600 &1,93,200 &5,24,400 \\
\hline
2 &Consumables &50,000 &50,000 &50,000 &1,50,000\\
\hline
```

```
3 &Travel &75,000 &75,000 &75,000 &2,25,000\\
\hline
4 &Other costs &&&&\\
( i ) &Books/Journals &75,000 &75,000 &75,000 &2,25,000\\
( i i ) &Contingency&50,000 &50,000 &50,000 &1,50,000\\
\hline
B &Equipments &1,50,000 &- &- &1,50,000\\
\hline
&Grand Total &&&&\\ &(A+B) &&&&14,24,400\\
\hline
&Total FEC$^{*}$ &&&& NIL\\
\hline
&\multicolumn{3}{c}{over head charge (20\% of the grand total)}
&&2,84,880\\
\hline
&\multicolumn{3}{c}{Total}&& 17,09,280\\
\hline
\end{tabular}
\end{document}
```

Output

	Item	Budget			Total
		1stYear	2ndYear	3rdYear	(in Rupees)
A	Recurring	JRF	JRF	SRF	
1	Salaries/Wages	1,65,600	1,65,600	1,93,200	5,24,400
2	Consumables	50,000	50,000	50,000	1,50,000
3	Travel	75,000	75,000	75,000	2,25,000
4	Other costs				
(i)	Books/Journals	75,000	75,000	75,000	2,25,000
(ii)	Contingency	50,000	50,000	50,000	1,50,000
B	Equipments	1,50,000	-	-	1,50,000
	Grand Total (A+B)				14,24,400
	Total FEC*				NIL
	over head charge (20% of the grand total)				2,84,880
	Total				17,09,280

9 CASE STATEMENTS

Question

Using LaTeX, type the following Case Statements:

1. $x\lambda = \begin{cases} x & \text{if } \lambda \text{ is a eigen value;} \\ -x & \text{if } -\lambda \text{ is an eigen value;} \\ 0 & \text{otherwise} \end{cases}$

2. $|x| = \begin{cases} x & \text{if } x \geq 0; \\ -x & \text{if } x < 0; \\ 0 & \text{otherwise} \end{cases}$

Coding

```
\documentclass[12pt]{article}
\usepackage{amsmath, amsthm,amsfonts,enumerate}
\begin{document}
\begin{enumerate}
\item
$ x\lambda=
\begin{cases}
x&\text{if $\lambda$ is a eigen value;}\\
-x&\text{if $-\lambda$ is an eigen value;}\\ 0& \text{otherwise}
\end{cases}
$
\item
$
|x|=
\begin{cases} x&\text{if $x\geq0 $;}\\
-x&\text{if $x<0 $;}\\ 0& \text{otherwise}
\end{cases}
$
\end{enumerate}
\end{document}
```

Output

1. $x\lambda = \begin{cases} x & \text{if } \lambda \text{ is a eigen value;} \\ -x & \text{if } -\lambda \text{ is an eigen value;} \\ 0 & \text{otherwise} \end{cases}$

2. $|x| = \begin{cases} x & \text{if } x \geq 0; \\ -x & \text{if } x < 0; \\ 0 & \text{otherwise} \end{cases}$

10 MATRICES

Question

Using LaTex type the following Matrices.

1. $$\begin{pmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{pmatrix}$$

2. $$B = \begin{array}{c} \\ s_1 \\ s_2 \\ s_3 \\ s_4 \\ s_5 \end{array} \begin{array}{c} \begin{array}{ccc} d_1 & d_2 & d_3 \end{array} \\ \begin{pmatrix} (0.6,0.2) & (0.6,0.2) & (0.3,0.4) \\ (0.3,0.5) & (0.2,0.6) & (0.7,0.2) \\ (0.1,0.8) & (0.2,0.7) & (0.7,0.2) \\ (0.4,0.5) & (0.7,0.2) & (0.3,0.4) \\ (0.1,0.7) & (0.1,0.8) & (0.2,0.7) \end{pmatrix} \end{array}$$

3. $$\begin{Bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{Bmatrix}$$

Coding

```
\documentclass[12pt]{article}
\usepackage{amsmath, amsthm,amsfonts,enumerate}
\begin{document}
\begin{enumerate}
\item
$
\left(
\begin{array}{ccc} a_{11} &\cdots &a_{1n}\\
\vdots &\ddots &\vdots\\ a_{m1} &\cdots &a_{mn}
\end{array}
\right)
$\\
\item
$ B=\bordermatrix
{&d_1&d_2&d_3\cr
s_1 &(0.6,0.2)&(0.6,0.2)&(0.3,0.4)\cr
s_2 &(0.3,0.5)&(0.2,0.6)&(0.7,0.2)\cr
```

```
s_3 &(0.1,0.8)&(0.2,0.7)&(0.7,0.2)\cr
s_4 &(0.4,0.5)&(0.7,0.2)&(0.3,0.4)\cr
s_5 &(0.1,0.7)&(0.1,0.8)&(0.2,0.7)\cr}
$
\item
$
\begin{Bmatrix}
a& b& c\\ d& e& f\\ g& h& i
\end{Bmatrix}
$
\end{enumerate}
\end{document}
```

Output

1. $\begin{pmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \cdots & a_{mn} \end{pmatrix}$

2. $B = \begin{array}{c} \\ s_1 \\ s_2 \\ s_3 \\ s_4 \\ s_5 \end{array} \begin{array}{c} \begin{array}{ccc} d_1 & d_2 & d_3 \end{array} \\ \begin{pmatrix} (0.6,0.2) & (0.6,0.2) & (0.3,0.4) \\ (0.3,0.5) & (0.2,0.6) & (0.7,0.2) \\ (0.1,0.8) & (0.2,0.7) & (0.7,0.2) \\ (0.4,0.5) & (0.7,0.2) & (0.3,0.4) \\ (0.1,0.7) & (0.1,0.8) & (0.2,0.7) \end{pmatrix} \end{array}$

3. $\begin{Bmatrix} a & b & c \\ d & e & f \\ g & h & i \end{Bmatrix}$

11 COMPLICATED MATHEMATICAL STRUCTURES

Question

Using LaTex, type the following complicated mathematical structures.

1. $$\binom{m+n}{m} = \frac{(m+n)!}{m!n!} mfactors mfactors ncopies = \frac{\overbrace{(m+n)(m+n-1)\cdots(n+1)}^{m\text{factors}}}{\underbrace{m(m-1)\cdots 1}_{m\text{factors}}}$$

2.
$$\begin{aligned} 1+2+\ldots+n &= \frac{1}{2}((1+2+\ldots+n)+(n+\ldots+2+1)) \\ &= \frac{1}{2}\underbrace{(n+1)+(n+1)+\ldots+(n+1)}_{n\text{copies}} \\ &= \frac{n(n+1)}{2} \end{aligned}$$

Coding

```
\documentclass[12pt]{article}
\usepackage{amsmath,amsthm,amsfonts,enumerate}
\begin{document}
\begin{enumerate}
\item
$
\displaystyle{m+n \choose m}
=\frac{(m+n)!}{m!n!}
m factors
m factors
n copies
=\frac{\overbrace{(m+n)(m+n-1)\cdots(n+1)} ^\text{$m$factors}}
{\underbrace {m(m-1)\cdots 1}_\text{$m$factors}}
$
\item
\begin{eqnarray*}
\displaystyle 1+2+\ldots+n&=&\frac{1}{2}((1+2+\ldots+n)+(n+\ldots+2+1))\\
```

```
&=&\frac{1}{2}\underbrace{(n+1)+(n+1)+\ldots+(n+1)}_{\mbox{$n$copies}}
\\ &=&\frac{n(n+1)}{2}\\
\end{eqnarray*}
\end{enumerate}
\end{document}
```

Output

1. $$\binom{m+n}{m} = \frac{(m+n)!}{m!n!} mfactorsmfactorsncopies = \frac{\overbrace{(m+n)(m+n-1)\cdots(n+1)}^{mfactors}}{\underbrace{m(m-1)\cdots 1}_{mfactors}}$$

2. $$\begin{aligned} 1+2+\ldots+n &= \frac{1}{2}((1+2+\ldots+n)+(n+\ldots+2+1)) \\ &= \frac{1}{2}\underbrace{(n+1)+(n+1)+\ldots+(n+1)}_{n\text{copies}} \\ &= \frac{n(n+1)}{2} \end{aligned}$$

12 EQUATION

Question

Using LaTex type the following equation:

$$\displaystyle\int\limits_0^{\infty}e^{-\rho}\rho^{2l}\left[L_{n+1}^{2l+1}\left(\rho\right)\right]^2\rho^2d\rho=\frac{2n\left[\left(n+1\right)!\right]^3}{(n-l-1)!}$$

$$\displaystyle\int\limits_0^{\infty}e^{-\rho}\rho^{2l}[L_{n+1}^{2l+1}(\rho)]^2\rho^2d\rho=\frac{2n[(n+1)!]^3}{(n-l-1)!}$$

Coding

```
\documentclass[12pt]{article}
\usepackage{amsmath, amsthm,amsfonts,enumerate}
\begin{document}
$$\displaystyle\int\limits_0^{\infty}e^{-
\rho}\rho^{2l}\left[L_{n+1}^{2l+1}\left(\rho\right)\right]^2\rho^2d\rho=\frac{
2n\left[\left(n+1\right)!\right]^3}{(n-l-1)!}$$
%without \left and \right
$$\displaystyle\int\limits_0^{\infty}e^{-\rho}\rho^{2l}
[L_{n+1}^{2l+1}(\rho)]^2\rho^2d\rho=\frac{2n[(n+1)!]^3}{(n-l-1)!}$$
\end{document}
```

Output

$$\displaystyle\int\limits_0^{\infty}e^{-\rho}\rho^{2l}\left[L_{n+1}^{2l+1}\left(\rho\right)\right]^2\rho^2d\rho=\frac{2n\left[\left(n+1\right)!\right]^3}{(n-l-1)!}$$

$$\displaystyle\int\limits_0^{\infty}e^{-\rho}\rho^{2l}[L_{n+1}^{2l+1}(\rho)]^2\rho^2d\rho=\frac{2n[(n+1)!]^3}{(n-l-1)!}$$

13 BEAMER PRESENTATION

Question

Create a frame environment with title LaTex Beamer presentation and include author name, institute, current date and footnote.

Coding

```
\documentclass{beamer}
\usetheme{Madrid}
\usepackage{indentfirst, enumerate}
\title[Sentiment analysis]{\bf SENTIMENT ANALYSIS}
\author[S.Mythili]{\bf S.Mythili(191MA001)}
\institute [KASC]{\\ III-B.Sc.Mathematics \\Kongunadu Arts and Science
College\\ }
\begin{document}
\date{29/04/2022}
\begin{frame}
\titlepage
\end{frame}
\begin{frame}
\frametitle{OUTLINE OF THE PRESENTATION}
\begin{itemize}
\item Introduction
\item Statistical Analysis
\item Sentiment Analysis
\item Conclusion
\end{itemize}
\end{frame}
\begin{frame}
\frametitle{Introduction}
\begin{itemize}
\item Sentiment is an idea or feeling that someone expresses in words.
\item Sentiment analysis is the process of predicting/extracting these ideas or
feelings.
\item There are many ways in finding the sentiment of the text.
\end{itemize}
\end{frame}
\begin{frame}
```

```
\frametitle{Statistical Analysis}
Statistics are applied every day { in research, industry and government { to
become more scientific about decisions that need to be made. \\
Statistical Methods for analysing the sentiment:
\begin{itemize}
\item Naive Bayes algorithm
\item Support vector Machine
\item Random forest
\end{itemize}
\end{frame}
\begin{frame}
\frametitle{Sentiment Analysis}
There are two main approach in analysing the sentiment of a text.
\begin{enumerate}
\item Machine Learning approach
\item Semantic orientation approach
\end{enumerate}
\begin{LARGE}
\textsc{\\Stages in sentiment analysis using ML Algorithms:}\\
\end{LARGE}
\begin{enumerate}
\item Text pre processing
\item Feature extraction
\item Feature Weighting and Representation
\item Machine Learning Algorithm
\end{enumerate}
\end{frame}
\begin{frame}
\frametitle{Conclusion}
Sentiment Analysis helps in many ways in improving the growth of the
company and in modifying the aspects over there.
\end{frame}
\end{document}
```

Output:

SENTIMENT ANALYSIS

S.Mythili(191MA001)

III-B.Sc.Mathematics
Kongunadu Arts and Science College

29/04/2022

OUTLINE OF THE PRESENTATION

- Introduction
- Statistical Analysis
- Sentiment Analysis
- Conclusion

Introduction

- Sentiment is an idea or feeling that someone expresses in words.
- Sentiment analysis is the process of predicting/extracting these ideas or feelings.
- There are many ways in finding the sentiment of the text.

Statistical Analysis

Statistics are applied every day – in research, industry and government – to become more scientific about decisions that need to be made.
Statistical Methods for analysing the sentiment:

- Naive Bayes algorithm
- Support vector Machine
- Random forest

Sentiment Analysis

There are two main approach in analysing the sentiment of a text.

1. Machine Learning approach
2. Semantic orientation approach

Stages in sentiment analysis using ML Algorithms:

1. Text pre processing
2. Feature extraction
3. Feature Weighting and Representation
4. Machine Learning Algorithm

Conclusion

Sentiment Analysis helps in many ways in improving the growth of the company and in modifying the aspects over there.

14 IMAGE INSERTION

Question

Include few figures in document.

Coding

```
    \documentclass[12pt]{article}
\usepackage{graphicx}
\begin{document}
\begin{Large}
People express their emotions in a different manner.
Some express through actions and some through emotions.
The emotions of the people can be visualized in figure \ref{fig:sentiment}.
\end{Large}
\begin{figure}
\centering
\includegraphics[scale =0.27]{sentiment.jpeg}
\caption{Sentiment}
\label{fig:sentiment}
\end{figure}
\end{document}
```

Output

People express their emotions in a different manner. Some express through actions and some through emotions. The emotions of the people can be visualized in figure 1.

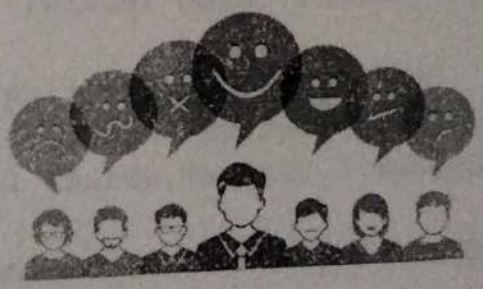


Figure 1: Sentiment

15 BIBLIOGRAPHY

Question

Create references using bibliography environment and cite the references in a document.

Coding

```
\documentclass{article}
\usepackage{amsmath, amsthm, amsfonts, enumerate}
\begin{document}
\title{\bf bibliography}
\section{Introduction}
Sentiment analysis is all about analysing the sentiment of the text and finding
out something meaningful over it.The approaches of the sentiment analysis is
taken from the book \cite{Bo}.\cite{papero},\cite{papert} are the papers used
to understand the concept of Sentiment Analysis. The procedure to find out the
sentiment analysis of text\\using Machine learning is carried out using
\cite{gfg}, \cite{Bt}
\begin{thebibliography}{15}\label{bibliography}
\bibitem{Bo} Prominent feature extraction for sentiment analysis B Agarwal, N
 Mittal {Springer
Publications-2016 Edition
\bibitem{Bt} Machine Learning, Pearson publications,Dr. Mark Fenner,First
Edition
\bibitem{papero}Abdullah Alsaeedi, Mohammad Zubair Khan, A Study on
Sentiment
Analysis Techniques of Twitter Data,(IJACSA) International Journal of
Advanced
Computer Science and Applications,Vol. 10, No. 2, 2019
\bibitem{gfg} Twitter sentiment analysis using python- Geeksforgeeks
\bibitem{papert} Vishal Kharde,Sheetal Sonawane, Sentiment Analysis of
Twitter
Data: A Survey of Techniques,International Journal of Computer Applications
139(11):5-15,April 2016
\end{thebibliography}
\end{document}
```

1 Introduction

Sentiment analysis is all about analysing the sentiment of the text and finding out something meaningful over it.The approaches of the sentiment analysis is taken from the book [1].[3],[5] are the papers used to understand the concept of Sentiment Analysis. The procedure to find out the sentiment analysis of text
using Machine learning is carried out using [4], [2]

References

[1] Prominent feature extraction for sentiment analysis B Agarwal, N Mittal -Springer Publications-2016 Edition

[2] Machine Learning, Pearson publications,Dr. Mark Fenner,First Edition

[3] Abdullah Alsaeedi, Mohammad Zubair Khan, A Study on Sentiment Analysis Techniques of Twitter Data (IJACSA) International Journal of Advanced Computer Science and Applications,Vol. 10, No. 2, 2019

[4] Twitter sentiment analysis using python- Geeksforgeeks

[5] Vishal Kharde,Sheetal Sonawane, Sentiment Analysis of Twitter Data: A Survey of Techniques,International Journal of Computer Applications 139(11):5-15,April 2016

16 PETERSON AND NAURU DIAGRAMS

Question

Use the LaTex package "tikz" to draw the Peterson and Nauru Diagrams

Coding

PETERSON DIAGRAMS

```
\documentclass{article}
\usepackage{tikz}
\usetikzlibrary{graphs}
\usetikzlibrary{graphs.standard}
\begin{document}
\begin{tikzpicture}[every node/.style={draw,circle,very thick}]
\graph[clockwise, radius=2cm] {subgraph C_n [n=5,name=A]};
\graph[clockwise, radius=1cm] {subgraph I_n [n=5,name=B]};
\foreach \i in {1,2,3,4,5}{\draw (A \i) -- (B \i);}
\newcounter{j}
\foreach \i in {1,2,3,4,5}{%
\pgfmathsetcounter{j}{ifthenelse(mod(\i+2,5),mod(\i+2,5),5)}
\draw (B \i) -- (B \thej);
}
\end{tikzpicture}
\end{document}
```

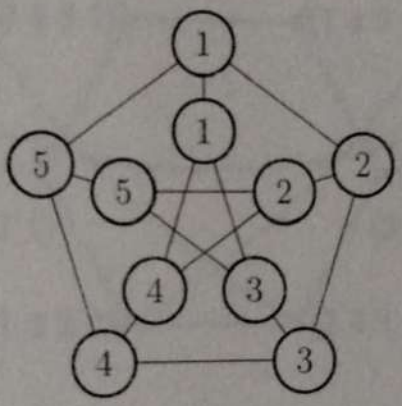
NAURU DIAGRAMS

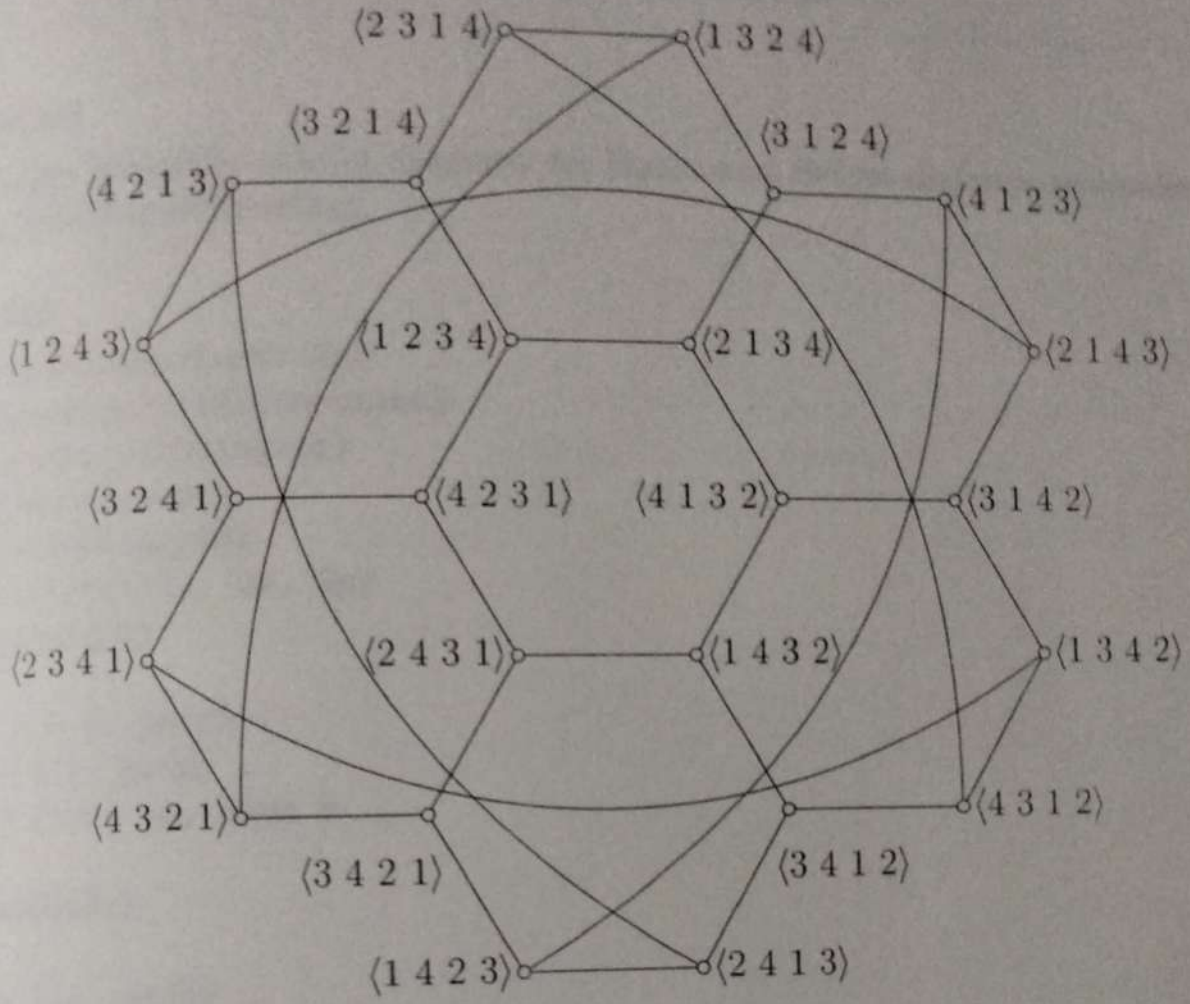
```
\documentclass{article}
\usepackage{tikz}
\usepackage{verbatim}
\begin{comment}
The star graph of order n has the set of all permutations of {1,2,...,n} as vertex
set and has an edge between any two vertices such that the corresponding
permutations can be obtained from one another by swapping the
first element with any other element (e.g. (1 2 3 4) will be connected to (3 2 1
4)). This drawing shows the star graph of order 4.
*Note*. You can find many examples of beautiful graphs in Anthony Labarre's
publications_ (especially his PhD thesis). Almost all of the graphs have been
drawn using TikZ.
\end{comment}
```

```
\newcommand{\LD}{\langle}
\newcommand{\RD}{\rangle}
\begin{document}
\begin{center}
\begin{tikzpicture}
\tikzstyle{every node}=[draw,circle,fill=white,minimum size=4pt, inner
sep=0pt]
% First, draw the inner hexagon with a ''pin'' -- namely, (3214)
\draw (0,0) node (1234) [label=left:$\LD 1\ 2\ 3\ 4\RD$] {}
-- ++(0:2.0cm) node (2134) [label=right:$\LD 2\ 1\ 3\ 4\RD$] {}
-- ++(300:2.0cm) node (4132) [label=left:$\LD 4\ 1\ 3\ 2\RD$] {}
-- ++(240:2.0cm) node (1432) [label=right:$\LD 1\ 4\ 3\ 2\RD$] {}
-- ++(180:2.0cm) node (2431) [label=left:$\LD 2\ 4\ 3\ 1\RD$] {}
-- ++(120:2.0cm) node (4231) [label=right:$\LD 4\ 2\ 3\ 1\RD$] {}
-- (1234) % shape is closed, we now connect it to an outer vertex:
-- ++(120:2.0cm) node (3214) [label=120:$\LD 3\ 2\ 1\ 4\RD$] {};
% Second, draw the ''outer backbone''
\draw (3214)
-- ++(60:2.0cm) node (2314) [label=left:$\LD 2\ 3\ 1\ 4\RD$] {}
-- ++(0:2.0cm) node (1324) [label=right:$\LD 1\ 3\ 2\ 4\RD$] {}
-- ++(300:2.0cm) node (3124) [label=60:$\LD 3\ 1\ 2\ 4\RD$] {}
-- ++(0:2.0cm) node (4123) [label=right:$\LD 4\ 1\ 2\ 3\RD$] {}
-- ++(300:2.0cm) node (2143) [label=right:$\LD 2\ 1\ 4\ 3\RD$] {}
-- ++(240:2.0cm) node (3142) [label=right:$\LD 3\ 1\ 4\ 2\RD$] {}
-- ++(300:2.0cm) node (1342) [label=right:$\LD 1\ 3\ 4\ 2\RD$] {}
-- ++(240:2.0cm) node (4312) [label=right:$\LD 4\ 3\ 1\ 2\RD$] {}
-- ++(180:2.0cm) node (3412) [label=-60:$\LD 3\ 4\ 1\ 2\RD$] {}
-- ++(240:2.0cm) node (2413) [label=right:$\LD 2\ 4\ 1\ 3\RD$] {}
-- ++(180:2.0cm) node (1423) [label=left:$\LD 1\ 4\ 2\ 3\RD$] {}
-- ++(120:2.0cm) node (3421) [label=-120:$\LD 3\ 4\ 2\ 1\RD$] {}
-- ++(180:2.0cm) node (4321) [label=left:$\LD 4\ 3\ 2\ 1\RD$] {}
-- ++(120:2.0cm) node (2341) [label=left:$\LD 2\ 3\ 4\ 1\RD$] {}
-- ++(60:2.0cm) node (3241) [label=left:$\LD 3\ 2\ 4\ 1\RD$] {}
-- ++(120:2.0cm) node (1243) [label=left:$\LD 1\ 2\ 4\ 3\RD$] {}
-- ++(60:2.0cm) node (4213) [label=left:$\LD 4\ 2\ 1\ 3\RD$] {}
-- (3214);
% Add missing ''straight'' edges
\draw (3241) -- (4231);
\draw (3421) -- (2431);
\draw (1432) -- (3412);
```

```
\draw (4132) -- (3142);
\draw (2134) -- (3124);
% And finally, add missing ''curved'' edges
\draw (2341) to [out=-35,in=215] (1342);
\draw (1243) to [out=35,in=-215] (2143);
\draw (4123) to [out=270,in=30] (1423);
 \draw (2314) to [out=-30,in=90] (4312);
\draw (1324) to [out=210,in=90] (4321);
\draw (4213) to [out=270,in=150] (2413);
\end{tikzpicture}
\end{center}
\end{document}
```

Output




⟨2 3 1 4⟩
⟨1 3 2 4⟩
⟨3 2 1 4⟩
⟨3 1 2 4⟩
⟨4 2 1 3⟩
⟨4 1 2 3⟩
⟨1 2 4 3⟩
⟨1 2 3 4⟩
⟨2 1 3 4⟩
⟨2 1 4 3⟩
⟨3 2 4 1⟩
⟨4 2 3 1⟩
⟨4 1 3 2⟩
⟨3 1 4 2⟩
⟨2 3 4 1⟩
⟨2 4 3 1⟩
⟨1 4 3 2⟩
⟨1 3 4 2⟩
⟨4 3 2 1⟩
⟨4 3 1 2⟩
⟨3 4 2 1⟩
⟨3 4 1 2⟩
⟨1 4 2 3⟩
⟨2 4 1 3⟩

17 MO DIAGRAMS

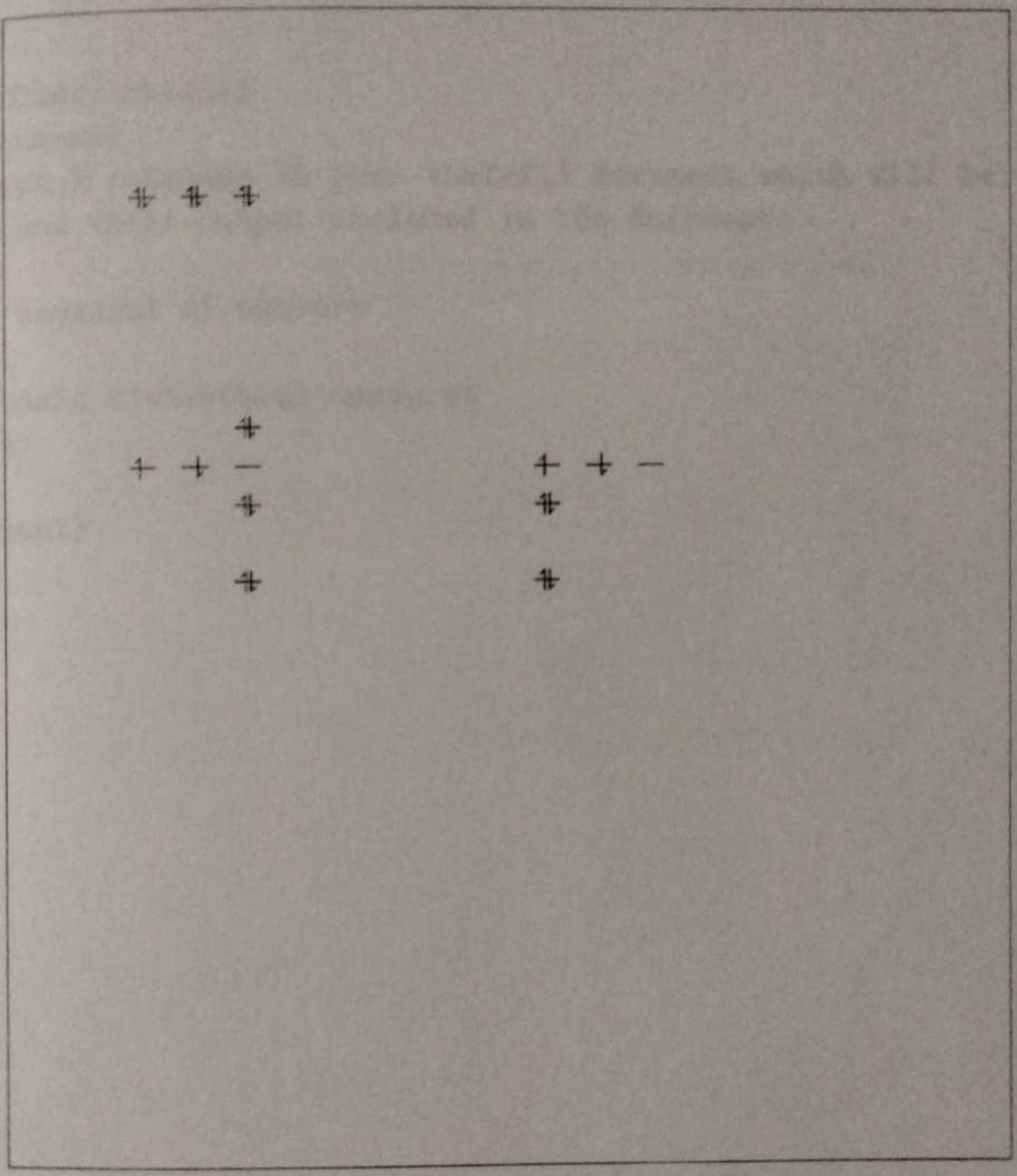
Question

Create Molecular orbital diagrams for Homo and Hetero diatomic molecules by using MO diagram package.

Coding

```
\documentclass{article}
\usepackage[utf8]{inputenc}
\usepackage{MOdiagram}
\begin{document}
\begin{MOdiagram}
\atom{left}{1s, 2s, 2p}
\atom{right}
{
 1s = { 0; pair} ,
2s = { 1; pair} ,
2p = {1.5; up, down }
}
\atom{left}
{
1s = { 0; pair} ,
2s = { 1; pair} ,
2p = {1.5; up, down }
}
\end{MOdiagram}
\end{document}
```

Output:



18 MERGING CODING OF R

Question

Merge the coding of R with the LaTex document and generate the output.

Coding

```
\documentclass{article}
\begin{document}
You can type R commands in your \LaTeX{} document which will be
processed and their output included in the document:
<<>>=
#Create a sequence of numbers
X = 2:10
#Display basic statistical measures
 summary(X)
@
\end{document}
```

Output:

You can type R commands in your LaTeX document which will be processed and their output included in the document:

```
#Create a sequence of numbers
X = 2:10
#Display basic statistical measures
summary(X)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##       2       4       6       6       8      10
```

19 POSTER

Question

Create scientific poster using Tikz poster or beamer poster package.

Coding

```
\documentclass[25pt, a4paper,portrait]{tikzposter}
\title{An Overview of Sentiment Analysis}
\author{Mythili Selvakumar}
\date{\today}
\institute{Kongunadu Arts and Science College}
\usepackage{blindtext,comment}
\usetheme{Board}
\begin{document}
\maketitle
\block{Introduction}
{
Sentiment literally means a view or opinion that is held or expressed. Analysis
means examining something in detail.
\newline Thus the Sentiment analysis means, examining the sentiment of the
opinion and finding out something meaningful.
\newline This analysis part is really important among the business people now
a-days.
}
\begin{columns}
\column{0.3}
\block{Types of Sentiment Analysis}
{
Ex. No: 19
POSTER
01-06-2022
\begin{enumerate}
\item Fine- Grained Sentiment Analysis: \ \
To understand the sentiment in terms of polarity of the text.
\item Emotion detection: \ \
To understand the sentiment by looking out the emotions such as anger,
happiness, sadness, joy, etc., in the text.
\item Aspect based Sentiment Analysis: \ \
```

```
To understand the sentiment of the particular aspect/thing in the
product/sentences.
\item Intent Analysis: \ \
To check out interest of the people
\end{enumerate}
}
\column{0.7}
\block{Sentiment Analysis Approaches}
{There are two types of Sentiment analysis approaches:
\begin{enumerate}
\item Semantic Approach \ \
Semantic Orientation based approach uses two different types of technique,
namely (i) Corpus-based and (ii) Dictionary/Lexicon/Knowledge based
approaches. Among these two approaches, the Corpus-based approach is the
simplest one. Corpus-based semantic orientation approach requires a large
dataset to detect the polarity of the terms and therefore the sentiment of the text.
\newline
\item Machine learning Approach \ \
Machine learning treats sentiment analysis as the text classification
problem. This algorithm works based on the two methods, supervised and
unsupervised learning methods. The Main target of the problem is
identified by grouping the contents available in the data set whereas, in
Supervised machine learning, the analysis is carried out by using a
labelled dataset.
\end{enumerate}\vspace{4cm}}
\note
[
targetoffsetx=-9cm,
targetoffsety=-6.5cm,
width=0.5\linewidth
]
{Note: For most of the analysis purposes, only Machine learning approach is
followed}
\end{columns}
\begin{columns}
\column{0.6}
\block{Sentiment Analysis Process}
{
\begin{tikzfigure}
\includegraphics[width=0.4\textwidth]{sentiment2.png}
```

```
\end{tikzfigure}
}
\column{0.4}
\block{Explanation of the Process}
{Despite the approaches mentioned, the process carried out by the sentiment
analysis is the same.The steps involved in the Process are mentioned below:
\begin{enumerate}
\item Step 1: Data Extraction: Data sets involving any kind of proper data is
taken and used for this analysis
\newline
\item Step 2: Text Pre processing: Before using the machine learning models to
the text, it needs to be pre-processed. This preprocessing step is even more
important when it comes to unstructured text.
\newline
\item Step 3: The next process is that, a suitable program is taken and the
analysis step is carried out.
\newline
\item Step 4: Finally the classification is done by using the algorithms.
\end{enumerate}}
\end{columns}
\block{References}{
\begin{enumerate}
\item Prominent feature extraction for sentiment analysis B Agarwal, N Mittal
-Springer Publications-2016 Edition
\item Vishal Kharde,Sheetal Sonawane, Sentiment Analysis of Twitter
Data: A Survey of Techniques,International Journal of Computer Applications
139(11):5-15,April 2016
\end{enumerate}}
\end{document}
```

Output:

An Overview of Sentiment Analysis

Mythili Selvakumar
Kongunadu Arts and Science College

Introduction

Sentiment literally means a view or opinion that is held or expressed. Analysis means examining something in detail. Thus the Sentiment analysis means, examining the sentiment of the opinion and finding out something meaningful. This analysis part is really important among the business people now-a-days.

Types of Sentiment Analysis

1. Fine- Grained Sentiment Analysis: To understand the sentiment in terms of polarity of the text.
2. Emotion detection: To understand the sentiment by looking out the emotions such as anger, happiness, sadness, joy, etc., in the text.
3. Aspect based Sentiment Analysis: To understand the sentiment of the particular aspect/thing in the product/sentences.
4. Intent Analysis: To check out interest of the people

Sentiment Analysis Approaches

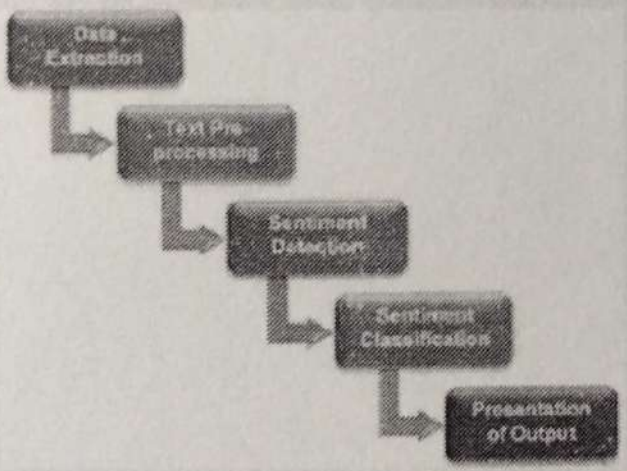
There are two types of Sentiment analysis approaches:

1. Semantic Approach: Semantic Orientation based approach uses two different types of technique, namely: (i) Corpus-based and (ii) Dictionary/Lexicon/Knowledge based approaches. Among these two approaches, the Corpus-based approach is the simplest one. Corpus-based semantic orientation approach requires a large dataset to detect the polarity of the terms and therefore the sentiment of the text.

2. Machine learning Approach: Machine learning treats sentiment analysis as the text classification problem. This algorithm works based on the two methods, supervised and unsupervised learning methods. The Main target of the process is identified by grouping the contents available in the data set, whereas, in Supervised machine learning, the analysis is carried out by using a labelled dataset.

Note: For most of the analysis purposes, only Machine learning approach is followed.

Sentiment Analysis Process



Explanation of the Process

Despite the approaches mentioned, the process carried out by the sentiment analysis is the same. The steps involved in the Process are mentioned below:

1. Step 1: Data Extraction: Data sets involving any kind of proper data is taken and used for this analysis.

2. Step 2: Text Pre processing: Before using the machine learning models to the text, it needs to be pre-processed. This preprocessing step is even more important when it comes to unstructured text.

3. Step 3: The next process is that, a suitable program is taken and the analysis step is carried out.

4. Step 4: Finally the classification is done by using the algorithms.

References

1. Prominent feature extraction for sentiment analysis B. Agarwal, N. Mittal -Springer Publications-2016 Edition
2. Vishal Khande,Sheetal Sonawane, Sentiment Analysis of Twitter Data: A Survey of Techniques,International Journal of Computer Applications 139(11):5-15,April 2016