COMM1190 Data, Insights and Decisions

# Week 1: Data, Analytics, and Organisation


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# About me

**Email: e.erfani@unsw.edu.au**

**Office: Rm 2073 Quadrangle Building E15**

**Consultation: Friday 12-13 pm**

**PhD in Information Systems from Macquarie University**

**10 years of experience in academic and industry**

**Taught at the University of Technology Sydney for 7 years**

**Interesting facts about me: loves painting and calligraphy, pianist, a big fan of nature**

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# Rajesh Lucknauth

Email: r.lucknauth@unsw.edu.au

Office: Rm 2045 Quadrangle Building Level 2

Consultation: Ed forum

- Associate Course Coordinator for COMM1190 since January 2022
- MBA in finance (Manchester Business School), Master of Economics (University of Sydney), Chartered Financial Analyst (CFA), Financial Risk Manager (FRM) and Fellow of Chartered Certified Accountants (FCCA)
- 20+ years of experience in financial services industry and adjunct lecturer in advanced corporate valuation at UTS from 2006-2016
- Interesting facts about me: ambidextrous and Saturday soccer player

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# Katja Ignatieva

Email: k.ignatieva@unsw.edu.au

Office: Business School, East wing, Level 6

Consultation: Tuesday 10.45-11.45

- Associate Professor in the School of Risk and Actuarial Studies
- Cotutelle PhD in Finance from Goethe University Frankfurt, Germany and Macquarie University
- Extensive research in financial econometrics (energy, financial and insurance markets)
- Interesting fact about me: piano player

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# Denzil Fiebig

Email: d.fiebig@unsw.edu.au

Office: Business School, Room 444

Consultation: Monday 3-4:30, Tuesday 10-11:30

- Professor in School of Economics
- PhD in Economics from University of Southern California
- Nearly 50 years experience in teaching & research in econometrics
- Interesting fact about me: played semi-professional basketball

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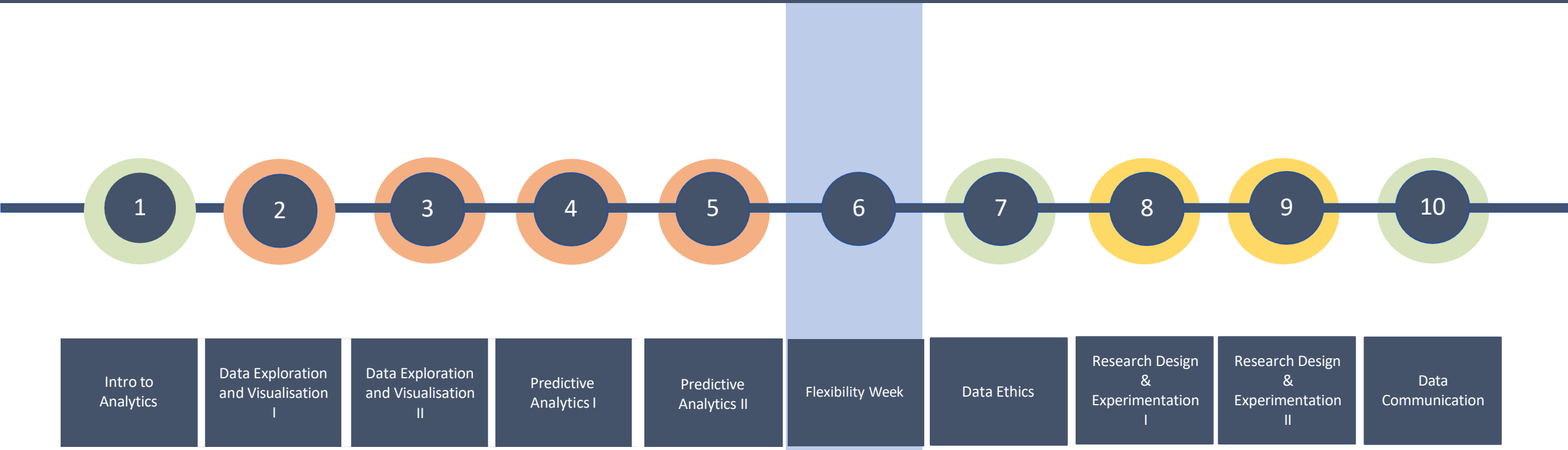
# Agenda

- Course and LMS Information
- Understanding Data
- Business Analytics: Implementation, Implications, and Challenges
- Introduction to R
- Key Features and Functions of R for Business Analytics

# COMM1190 Data, Insights & Decisions



# About COMM1190

## Lectures

- Develop and engage in an **analytics mindset**
- An overview of **business analytics cycle** and different types of analytics techniques
- A range of **analytics techniques**
- **Ethical** use of data
- **Research design** using experimentation
- Effective **data communication** with stakeholders

## Tutorials

- **Apply** theoretical concepts learned from lectures to workshop activities
- **Understand the basics of R** programming, how it can be applied, the meaning of the results, and the insights you could derive
- Analyse real-world case studies

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# Weekly course activities

Pre-workshop activities

Live lecture & QA: 1.5 hr

Workshops: 2 hrs online or F2F

Self-study:
Pre-workshop activities, reading, watch videos preparation for tutorials and assessments

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# Course expectations

To fully benefit from this course, you are encouraged

- Complete the pre-workshop activities before your arrival to lectures and workshops
- Practice extensively the analysis outside the formal lectures and workshops to solidify your learning

Workshops will be used to reinforce materials covered in the lectures

- You **must attend weekly lectures** or watch a recording before going to a workshop class
- Engage during the workshops and ask questions

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# Course Administration

Course communication channels

- General questions: Ed forum
- Customized questions: COMM1190@unsw.edu.au

Special consideration

- Send requests to COMM1190@unsw.edu.au and copy it associate course coordinator Rajesh Lucknauth r.lucknauth@unsw.edu.au

Class attendance

- Online: use your UNSW email to log in UNSW IT support
- In-person: COVID-19 - UNSW Sydney

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# IFY Course Structure

**Theme**

## 1 Business Management

> Financial Management

> Organisational Resources

> Value Creation

> Data, Insights and Decisions

Looking at what goes on inside an individual organisation

**Theme**

## 2 Business Ecosystem

> Business Decision Making

> Global Business Environments

Considering the broader environment in which an organisation operates

**Theme**

## 3 Skills and Capabilities

> Evidence-based Problem Solving

> Collaboration and Innovation in Business

Equipping you with a suite of skills and capabilities

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# Bachelor of Commerce Degree

## MyBCom Portfolio

- MyBCom Portfolio is an online platform that keeps you on track for your future. It guides your studies, develops your personal career plan and builds a selection of your work to showcase to future employers.
- Log into MyBcom platform https://mybcom.unsw.edu.au/

## COMM1999 myBCom First Year Portfolio

- COMM1999 is a compulsory 'gateway' in your Bachelor of Commerce degree. COMM1999 is a prerequisite for your compulsory Work Integrated Learning (WIL). Ideally you will complete COMM1999 in the term when you complete the last of your Integrated First Year courses.

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# Empower educators

## with a flexible, open source LMS

Excel in collaborative learning using a world-class online learning management system.

Discover Moodle LMS

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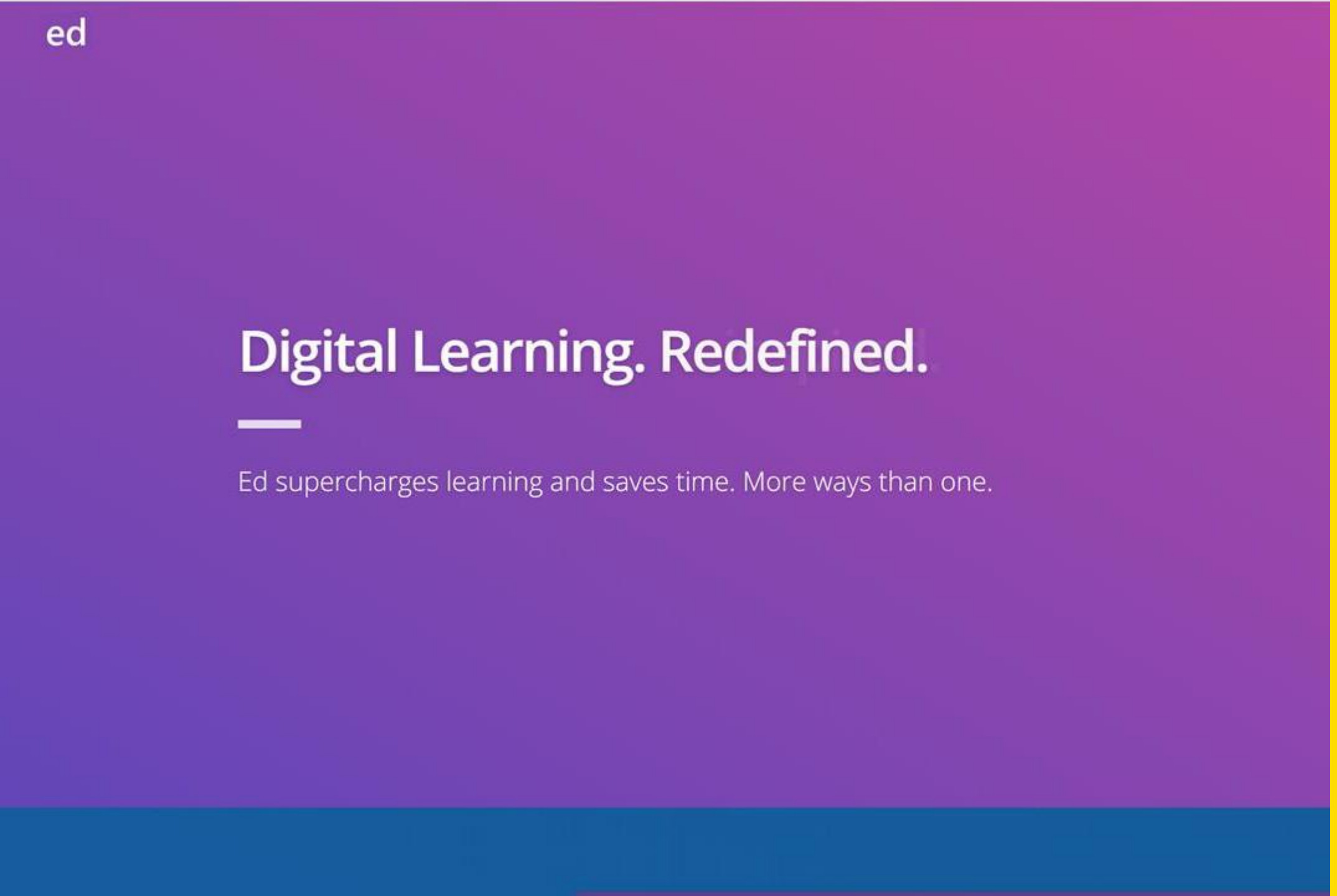
ed
Digital Learning. Redefined.
Ed supercharges learning and saves time. More ways than one.

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# Assessments

## Individual Report Assignment (20%)

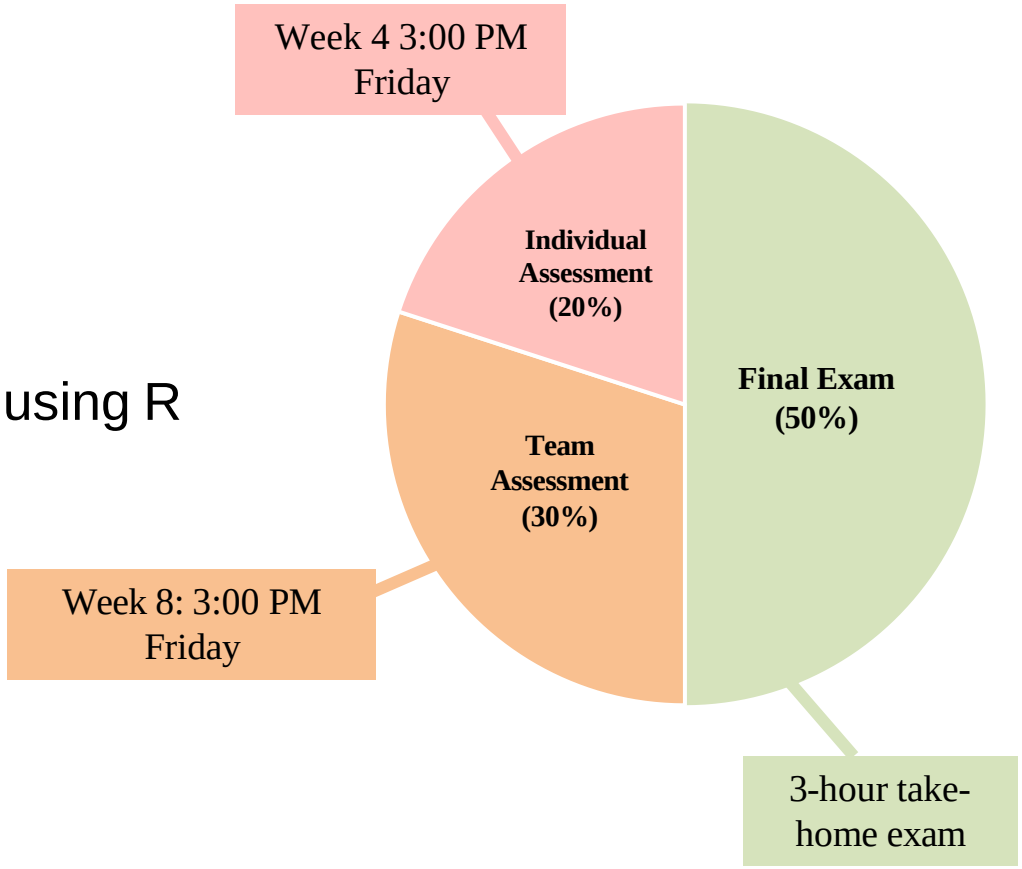
- Descriptive Analytics using R
- Written report, 750 words

## Team Report Assignment (30%)

- Descriptive and Predictive Analytics using R
- Written report, 2000 words

## Final Exam (50%)

- 3-hour take-home exam

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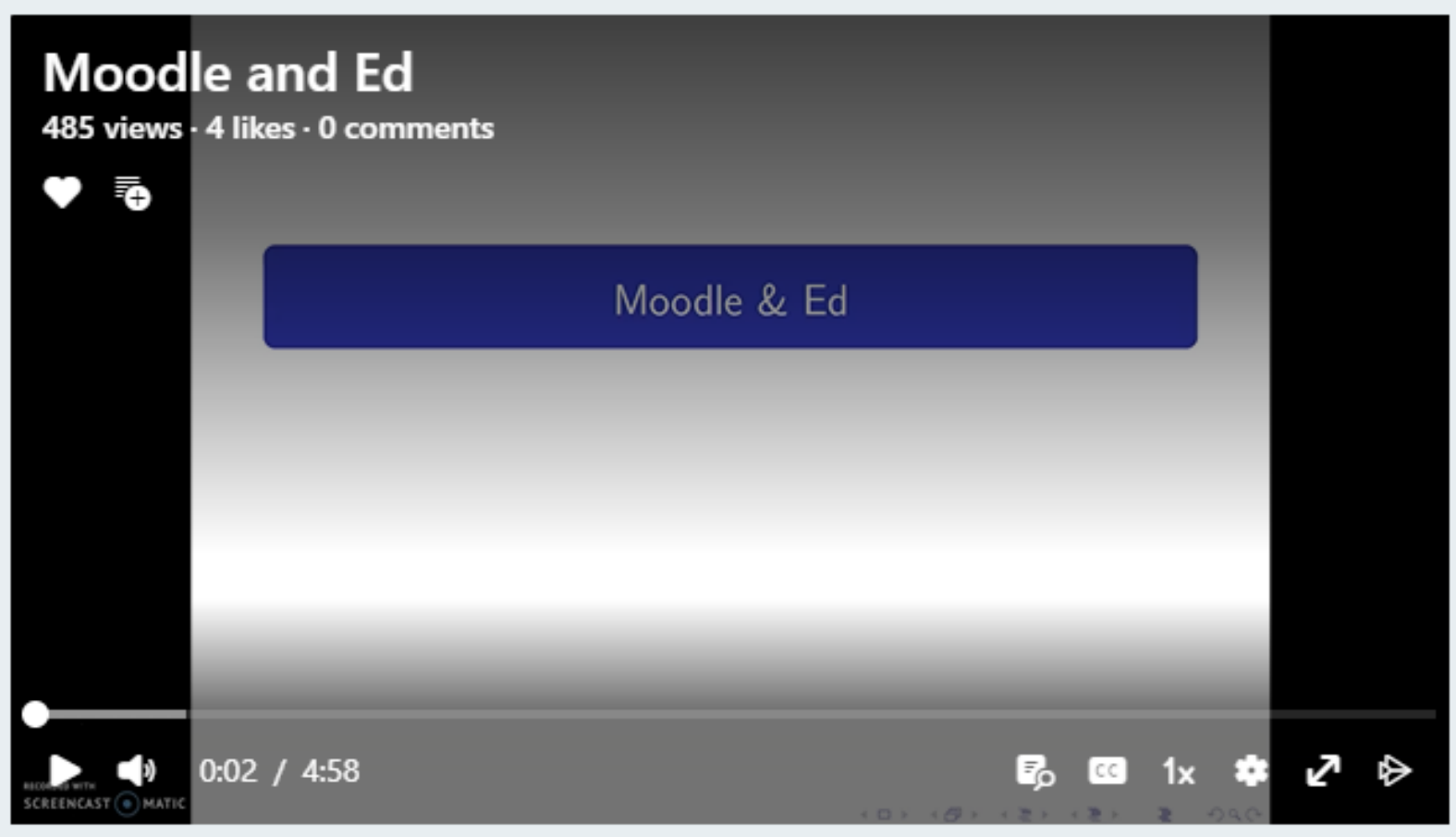
# How to use Moodle and Ed




[COMM1190 Moodle Course Site]

[COMM1190 Ed Course Site]

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# Questions?


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# Definition of Data:

Data refers to raw facts that should be collected, organized, and analyzed to serve as the foundation for insights that will inform decision-making.

**Types of Data:**

Structured Data: Organized in a predefined format with a well-defined schema.

Semi-Structured Data: Lacks rigid structure but contains some form of organization. Examples: log files, XML documents, JSON files.

Unstructured Data: No specific format or organization. Examples: media posts, images, audio files, videos.

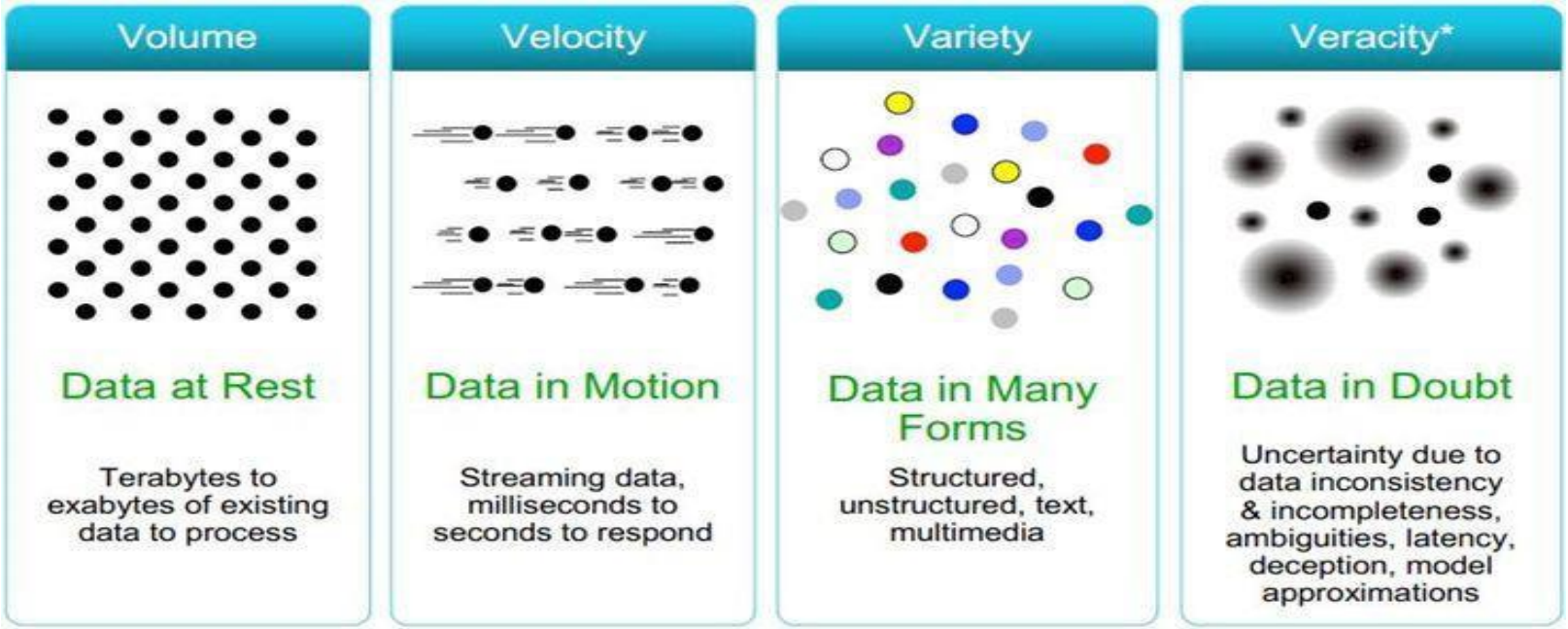
# How can we derive insights from data, transform them into valuable insights, and effectively inform decision-making?

# Business analytics

- The process of applying data-driven methodologies and analytical techniques.
- Aims to uncover trends in **big/data** and extract meaningful insights.
- Uses insights to create value and support decision-making

# The Prominence of Business Analytics

Large Amount of Diverse Data Generated at High Speed

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# Phases and Stages of BA Implantation

**Prepare, Analyse, Act, Transform**

**4.Transform**

Measuring value of the decision and adjusting the course when needed.

Adjust

Measure

Data-driven decision

**3.Act**

leadership's decision

**BA Implantation**

Problem Framing

Data Mining

Data Cleansing

**1. Prepare**

Problem shaping and data readiness


Descriptive Analytics

Predictive Analytics

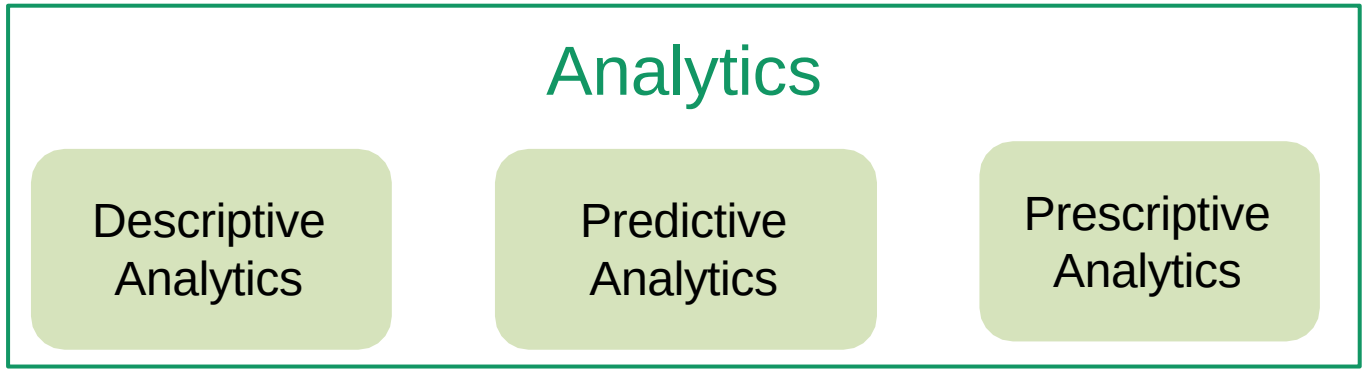
Prescriptive Analytics

**2. Analytics**

| | |
|---|---|
| Descriptive Analytics | What happened? |
| Predictive Analytics | What will happen? |
| Perspective Analytics | How do I take advantage ? |

Building models, testing algorithms and creating insights from the cleaned data

# Types of Business Analytics



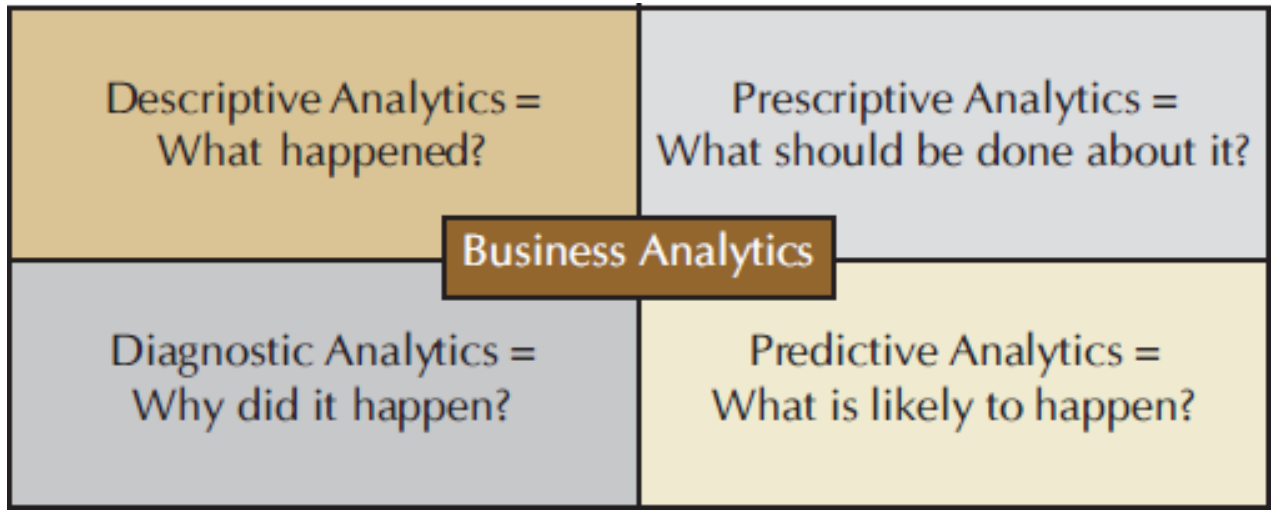




Figure in Banerjee et al., 2013, p.1

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# Descriptive Analytics

- Descriptive analytics focuses on summarizing historical data to provide insights into past events.
- It involves analyzing data to identify patterns, trends, and key performance indicators (KPIs).
- Useful for understanding past business performance and gaining a baseline understanding of operations.

# Diagnostic Analytics

- Diagnostic analytics aims to determine the reasons behind specific outcomes or patterns.
- It involves analyzing data to uncover the root causes contributing to successes or failures.
- Helps businesses make targeted improvements by understanding underlying factors.

# Predictive Analytics

- Predictive analytics utilizes historical data and statistical models to forecast future outcomes and trends.
- Analyzes data to identify patterns and make predictions about future events.
- Enables organizations to anticipate demand, identify risks, and make a proactive decision

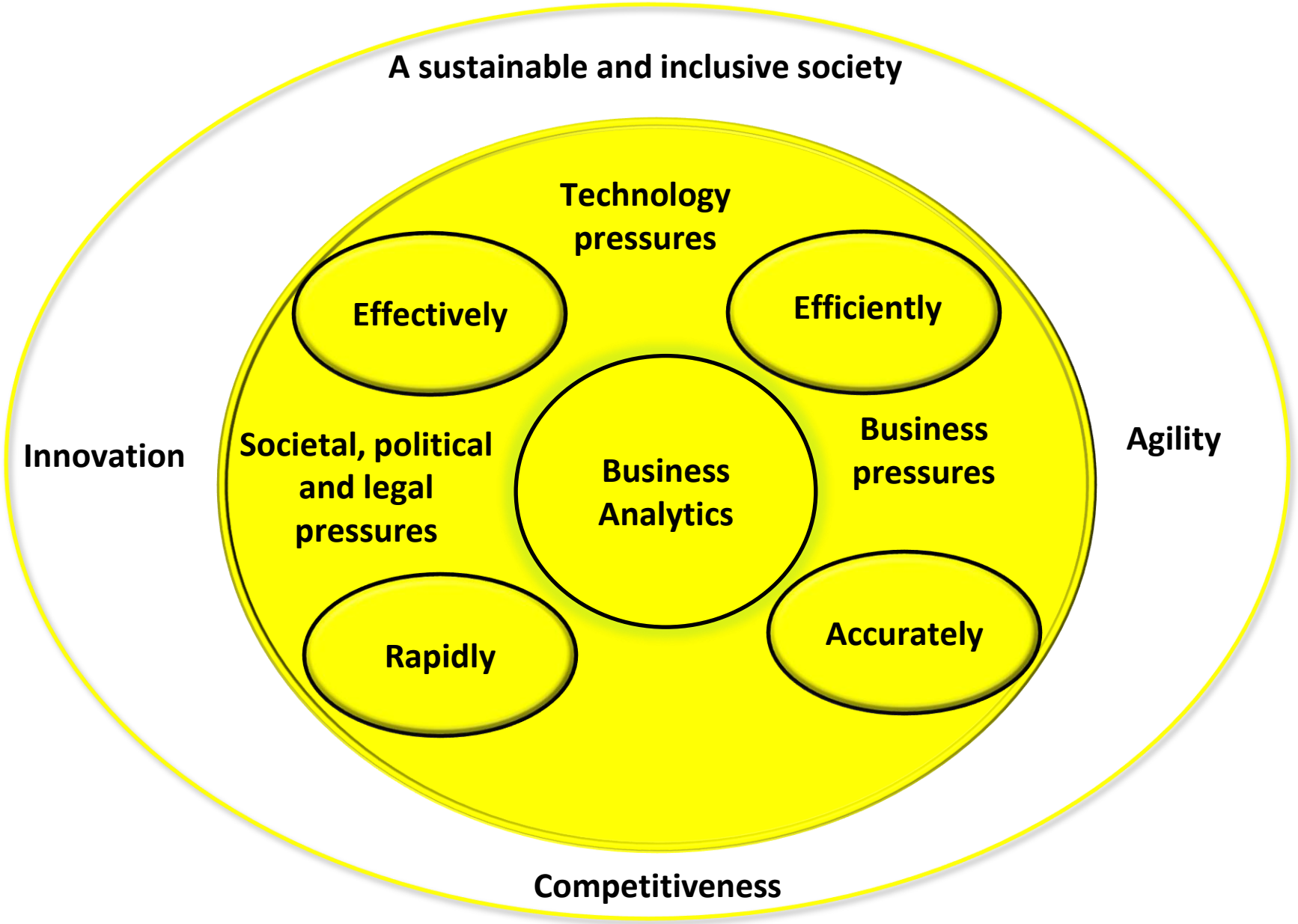
# Prescriptive Analytics

- Prescriptive analytics goes beyond predictive analytics by providing recommendations on actions to optimize outcomes.
- Analyzes data, applies algorithms, and considers constraints to determine the best course of action.
- Helps businesses make data-driven decisions and optimize their strategies

# What are the benefits of business analytics

**Top**

BA empowers companies to tap into the wealth of knowledge hidden within their constantly expanding data/big data




Companies gain the ability to make quicker, more intelligent, well-informed, and proactive decisions through business analytics.

# Benefits of Business Analytics

- **Improved Decision-Making:** Business analytics provides valuable insights that support informed and data-driven decision-making.
- **Enhanced Operational Efficiency:** By analyzing data, organizations can identify inefficiencies, optimize processes, and eliminate bottlenecks.
- **Competitive Advantage**: Leveraging data analytics allows organizations to gain a competitive edge by uncovering market trends, customer preferences, and competitor insights.
- I**mproved Customer Experiences**: Business analytics helps organizations understand customer behavior, preferences, and needs.
- **Risk Mitigation:** By analyzing historical data and applying predictive models, businesses can identify and mitigate potential risks.
- **Innovation and New Opportunities**: Organizations can use these insights to drive innovation, develop new products/services, and enter new markets.
- **Efficient Resource Allocatio**n: By analyzing data on resource utilization, businesses can optimize their allocation of budgets, workforce, and assets.

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# what are challenges of implementing Business Analytics?

**Top**

# Challenges of Business Analytics

Data Quality and Integration

- Ensuring data quality is a challenge, as data may be incomplete, inconsistent, or contain errors.
- Integrating data from multiple sources with varying formats and structures adds complexity to analytics projects.

Data Privacy and Security

- Protecting sensitive and confidential data from unauthorized access or breaches is a significant challenge.
- Compliance with data privacy regulations like GDPR or HIPAA adds complexity to data handling and storage.

Analytical Skills Gap

- There is a shortage of professionals with the necessary analytical skills in the industry.
- Bridging the skills gap through training and development is essential for organizations.

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# Challenges of Business Analytics

Scalability and Infrastructure

- Handling large-scale data processing, storage, and analytics requires robust infrastructure.
- Scaling analytics capabilities can be challenging, particularly for organizations with limited resources.

Cultural and Organizational Challenges

- Fostering a data-driven culture and promoting the value of analytics can face resistance.
- Collaboration between business and analytics teams is essential for successful implementation.

Technological Advancements

- Keeping pace with evolving tools, technologies, and techniques in analytics is a challenge.
- Evaluating and adopting the right advancements is crucial for staying competitive.

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# Challenges of Business Analytics

Interpretation and Communication

- Effectively interpreting analytical results and communicating them to non-technical stakeholders is challenging.
- Presenting complex findings in a clear, understandable, and actionable manner is crucial.

Ethical Considerations

- Ethical concerns arise regarding personal data usage and potential biases in algorithms.
- Ensuring ethical practices, fairness, and transparency in data analytics is an ongoing challenge.


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# what are the skills for Implementing Business Analytics?

# Skills for Implementing Business Analytics

- **Data Analysis**: Proficiency in analyzing and interpreting data using tools like Excel, SQL, Python, or R.
- **Data Visualization:** Ability to effectively visualize data using tools like Tableau, Power BI
- **Problem-Solving:** Strong problem-solving skills to identify business challenges and derive actionable insights.
- **Business Acumen:** Understanding of business operations, industry dynamics, and key performance indicators (KPIs).
- **Communication Skills:** Effective communication to convey complex analytical findings to non-technical stakeholders.
- **Machine Learning and AI:** Familiarity with machine learning algorithms and AI techniques for advanced analytics.
- **Data Management:** Skills in data cleaning, integration, and ensuring data quality and integrity.
- **Collaboration and Teamwork:** Ability to work effectively in cross-functional teams and collaborate with stakeholder

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# Why should we learn R for data-driven adventures?

**1. Powerful Data Analysis:** Versatile language for data exploration and manipulation, Offers a wide range of statistical and graphical techniques

**2. Extensive Data Science Ecosystem:** Vast collection of packages and libraries, Specialized tools for data analysis, machine learning, and visualization

**3. Integration with Business Tools:** Seamless integration with popular tools and software, Excel, SQL databases, Apache Hadoop, Spark, and more

**4. Reproducibility and Collaboration:** Promotes reproducible research and documentation, Simplifies collaboration and teamwork with version control systems

**5. Career Opportunities:** Opens doors to exciting data analytics and science roles, High demand for professionals who can derive insights from data

**6. Community Support and Learning Resources:** Strong and supportive R community, Access to tutorials, online courses, forums, and user groups

**7. Data-Driven Decision Making:** Essential for success in the modern business landscape, Uncover patterns, trends, and insights for informed decision making

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# R Demonstration


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