

# **BSBINS401 - Analyse and Present Research Information**

## **Session 6: Report Writing & Effective Visuals**

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## Learning Objectives

1. Understand the core components of a well-structured report.
2. Learn strategies for choosing effective visuals to support your findings.
3. Explore Jupyter nbconvert for converting .ipynb notebooks to PDF.
4. Demonstrate the workflow from notebook to a polished PDF report.

## Session Overview

- Writing an Effective Report
- Structuring Your Findings and Analysis
- Selecting the Right Visuals
- Introducing nbconvert
- Demonstration: Converting .ipynb → PDF
- Final Tips and Best Practices

# 1. Writing an Effective Report

## Elements of a Comprehensive Report

Section	Contents / Purpose
<b>Introduction</b>	Clearly define research objectives, context, and scope
<b>Methodology</b>	Describe data collection, cleaning, analysis approaches
<b>Analysis &amp; Findings</b>	Present data-driven insights, tables, and charts
<b>Discussion</b>	Interpret findings; link back to objectives; note limitations
<b>Conclusions &amp; Recommendations</b>	Sum up key takeaways; outline potential next steps
<b>References &amp; Appendices</b>	Cite sources, include supplementary data or code

## 2. Structuring Your Findings & Analysis

- **Flow of Information:**
  - Start broad with context → Narrow down to specific analysis → Summarize key insights
- **Maintain Clarity:**
  - Use headings, bullet points, sub-sections
  - Avoid jargon, or define it clearly
- **Tell a Story:**
  - Guide readers through logical steps
  - Provide necessary background and context

### 3. Choosing Effective Visuals

1. **Relevance**: Does this visual directly support your key findings?
2. **Simplicity**: Minimize clutter; highlight the most important data points.
3. **Appropriate Graph Type**:
  - Bar chart for categorical comparisons
  - Line chart for trends over time
  - Histogram for distribution
  - Scatter plot for relationships (two variables)
4. **Aesthetics**: Clear labels, consistent color scheme, readable font sizes

## Example: Aligning Data to Visual Choice

Data / Finding	Possible Visual(s)	Why it Works
Sales by Region	Bar Chart / Donut Chart	Compares discrete categories clearly
Student Scores Over Time	Line Chart	Shows trends or fluctuations
Two Variables Relationship	Scatter Plot	Reveals correlation or clustering

## 4. Introducing nbconvert

### What is nbconvert?

“nbconvert” is a tool that allows you to convert Jupyter Notebooks to a variety of formats like HTML, PDF, and slides.

### Why Use nbconvert?

Streamline your workflow from interactive exploration to final deliverables.  
Share your work with stakeholders in PDF or HTML format.  
Standardize reporting outputs in a reproducible manner.



## 5. Demo: Converting .ipynb → PDF

### Prerequisites

- Ensure you have a working LaTeX distribution for PDF export (e.g., MiKTeX, TeX Live).
- Install nbconvert if not installed:

```
pip install nbconvert
```

### Basic Command

```
jupyter nbconvert your_notebook.ipynb --to pdf
```

- This will generate a PDF in the same directory, using the default exporter.

## Demonstration Steps

1. **Open Terminal/Command Prompt**
2. **Navigate** to the folder containing your .ipynb file
3. **Run** the nbconvert command:

```
jupyter nbconvert MyAnalysis.ipynb --to pdf
```
4. Check for any errors (e.g., missing LaTeX components)
5. **Locate** your newly created PDF in the same directory

## 6. Best Practices for PDF Exports

### 1. Clean Up the Notebook

- Remove extraneous code cells or debugging outputs
- Add section headings and markdown explanations

### 2. Check Image Sizes

- Large images may get clipped in PDFs

### 3. Use a Stylized Template (Optional)

- You can customize nbconvert templates for consistent branding

### 4. Verify Font Rendering

- Especially for special characters or math expressions

## Activity: Practice Converting a Notebook

1. **Download** the sample Jupyter Notebook from the LMS (or create your own).
2. **Edit** the notebook to include a short explanation, 1–2 visuals, and a conclusion.
3. **Export** using nbconvert → PDF.
4. **Review** the finished PDF for clarity and formatting.

## Final Tips & Next Steps

- **Incorporate Effective Visuals:**
  - Provide context, label axes, and include brief captions.
- **Refine Your Report:**
  - Structure it for readability.
  - Use headings, bullet points, and short paragraphs.
- **Prepare for Assessment 1:**
  - Draft your methodology and findings with meaningful visuals.
- **Next Session:**
  - Peer review your initial report drafts.
  - Discuss advanced presentation methods.

## Questions?

- Office Hours: Monday – Friday, 9 AM – 5 PM
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