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Roll Number: 45	Lab Assignment Number: 7
Title of Lab Assignment: To install and configure Power BI for educational usage.	
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CO Mapped:	PO Mapped:	Signature:

Practical No. 7

Aim: To install and configure Power BI for educational usage.

Theory:

Power BI is a business analytics tool developed by Microsoft that enables users to visualize data, share insights, and perform ad-hoc analysis with intuitive reports and dashboards. It allows businesses to transform raw data into meaningful insights for decision-making. Here's an overview of the main aspects of Power BI:

What is Power BI?

Power BI is a collection of software services, apps, and connectors that work together to turn unrelated sources of data into coherent, visually immersive, and interactive insights. Whether your data is in Excel spreadsheets, cloud services, on-premises databases, or a mix of these, Power BI helps to easily connect to the data, model it, and then visualize it in user-friendly reports.

Components of Power BI

Power BI is divided into several components, each serving a different purpose:
- Power BI Desktop: A Windows-based application used to create reports and data models.
- Power BI Service: An online SaaS (Software as a Service) platform where reports are published, shared, and consumed.
- Power BI Mobile: Allows users to view and interact with Power BI reports on mobile devices.
- Power BI Gateway: A tool used to connect Power BI with on-premises data sources for real-time data analysis.
- Power BI Report Builder: A tool for creating paginated reports (pixel-perfect, print-ready).
- Power BI Embedded: Allows developers to embed Power BI functionality in custom apps.

Key Features of Power BI
- Data Connection: Power BI can connect to a wide range of data sources, including Excel, SQL Server, Azure, Google Analytics, Salesforce, and many others.

- Data Transformation and Modeling: Power BI provides tools like Power Query Editor to clean and transform data. It also supports DAX (Data Analysis Expressions), a formula language used for creating custom calculations.
- Interactive Reports: Users can create highly interactive reports with a variety of visualizations such as bar charts, pie charts, maps, gauges, and more.
- Real-time Dashboards: Power BI supports real-time data streaming, allowing users to monitor live performance metrics.
- Natural Language Query (Q&A): Users can ask questions about their data in natural language, and Power BI generates visuals in response.

Power BI Architecture

Power BI follows a multi-layered architecture to process, transform, and visualize data:

- Data Sources Layer: This includes multiple types of data sources like relational databases, NoSQL databases, web services, and cloud services.
- Data Transformation Layer: This layer is responsible for data cleansing and transformation using Power Query.
- Data Modeling Layer: In this layer, relationships between different data tables are defined and custom metrics or columns are created using DAX.
- Visualization Layer: This layer allows for data representation through various charts, graphs, and dashboards.
- Distribution Layer: Reports and dashboards are published to Power BI Service or shared across teams for collaboration.

Benefits of Power BI

- Ease of Use: Power BI is user-friendly, with drag-and-drop functionalities that allow users to create reports without extensive technical knowledge.
- Cost-Effective: It has both free and paid versions, making it accessible to small businesses and large enterprises.
- Cloud-Based: It supports real-time access to data and reports from any device, anywhere, using the cloud.
- Scalability: It can handle large datasets efficiently and integrate with various data sources.
- Collaboration: It allows easy sharing of reports and dashboards within an organization.

Applications of Power BI
- Business Intelligence: Power BI is widely used to track KPIs, generate financial reports, and monitor business performance.
- Data-Driven Decision Making: It helps organizations make data-driven decisions by providing real-time analytics and dashboards.
- Sales and Marketing Analytics: Power BI enables sales and marketing teams to analyze customer data, track campaigns, and optimize performance.
- Supply Chain Analytics: It can be used for monitoring and optimizing inventory levels, supplier performance, and logistics.

Power BI vs Other BI Tools
- Integration with Microsoft Tools: Power BI integrates seamlessly with Microsoft products like Excel, Azure, and Teams, making it the preferred choice for organizations already using the Microsoft ecosystem.
- Cost Efficiency: Compared to tools like Tableau, Power BI is more cost-effective, especially for small and medium-sized enterprises.
- Ease of Learning: Power BI is easier to learn for users who are already familiar with Excel, thanks to its similar interface and features.

Use Cases
- Financial Reporting: Power BI is used to create real-time financial dashboards that track revenue, expenses, and profitability.
- Customer Segmentation: It can help analyze customer data to identify segments and personalize marketing campaigns.
- Operational Dashboards: Businesses can create operational dashboards that track key metrics such as production efficiency, inventory levels, and employee performance.

Power BI plays a crucial role in data-driven decision-making by providing an intuitive and powerful platform to analyze, visualize, and share business data.
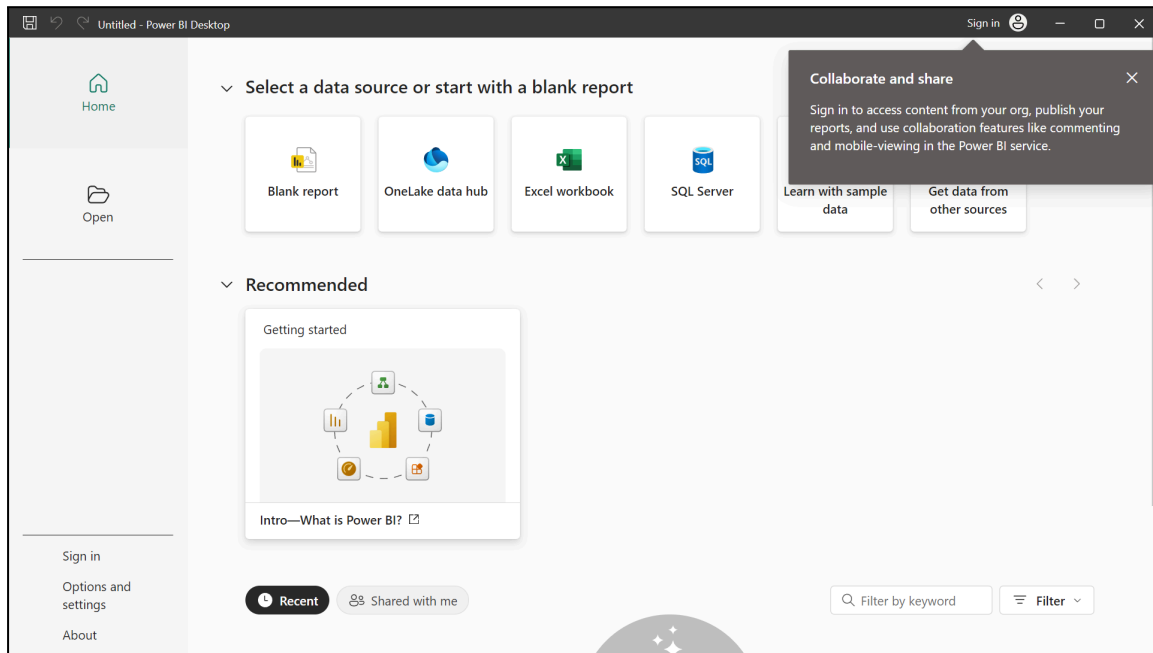
Download Power BI Desktop
- Visit the official Power BI website and click on the Download Free button.
- You can also get Power BI Desktop from the Microsoft Store for easier updates.
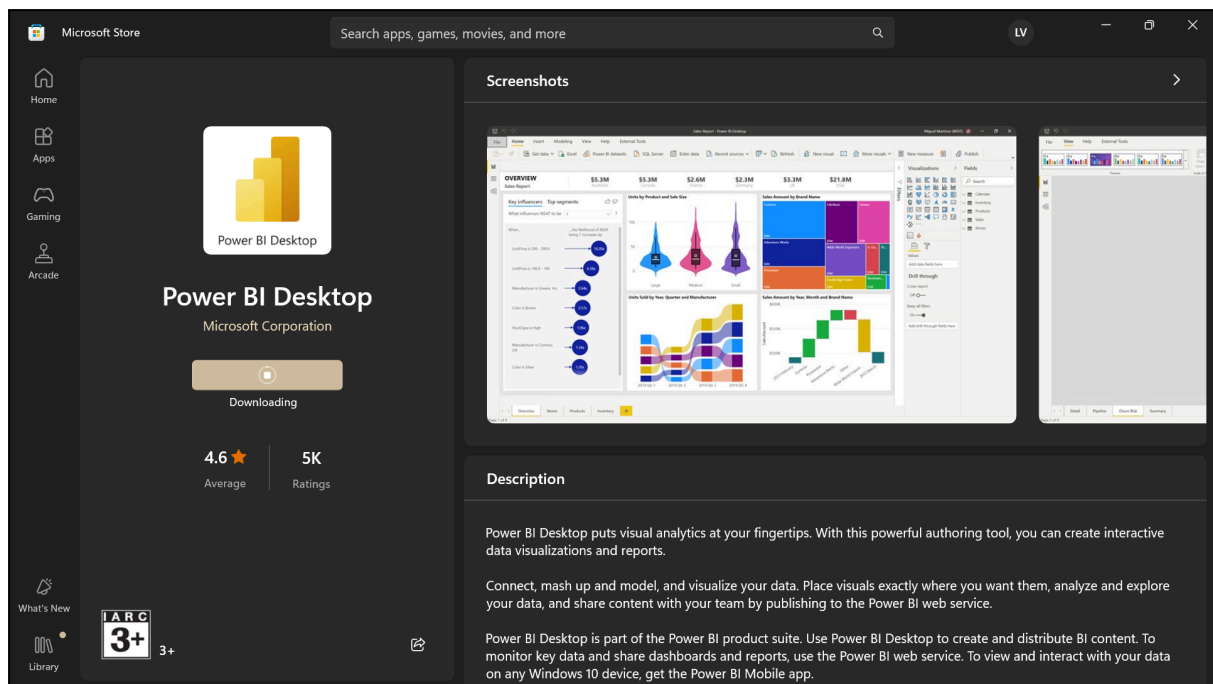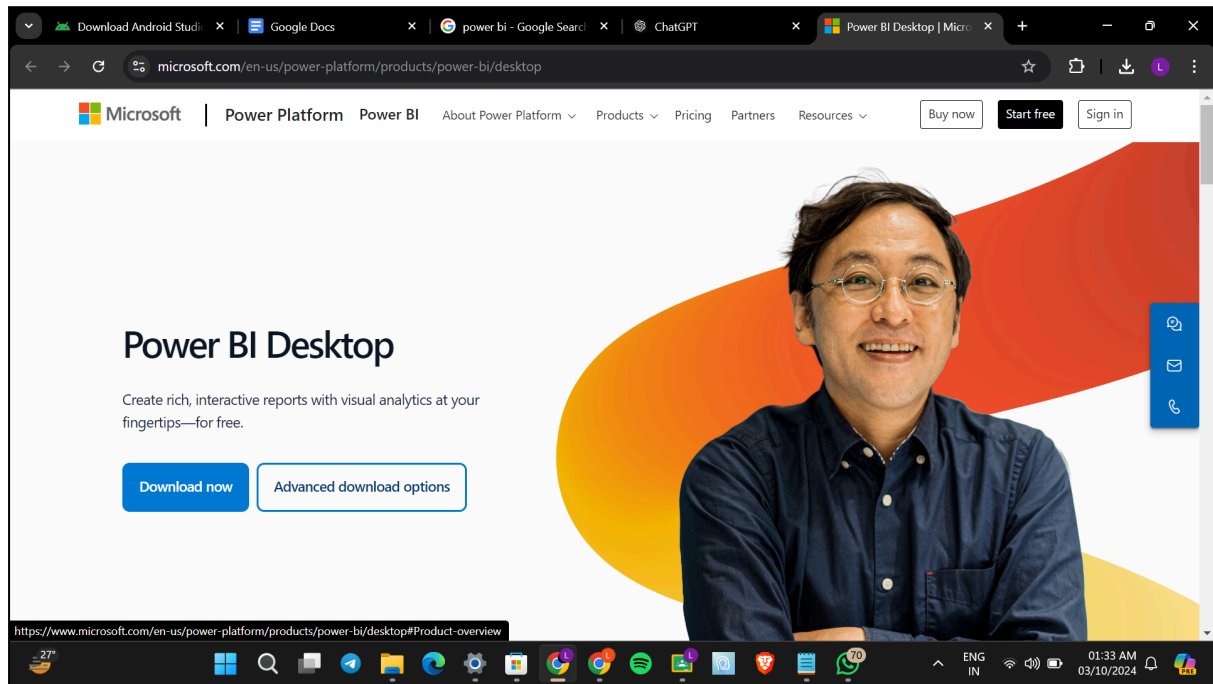
Install Power BI Desktop

- Run the downloaded file and follow the installation wizard.
- After installation, launch Power BI Desktop from your Start menu or desktop icon.

Sign Up for Power BI Service (Optional)

For cloud-based sharing and collaboration, you can use Power BI Service:

- Go to Power BI Service.
- Sign up with an educational or work email address. You can also use your institutional email if it's connected to Office 365 for schools.
- You will get access to **Power BI Service** with limited free features for sharing and publishing reports.
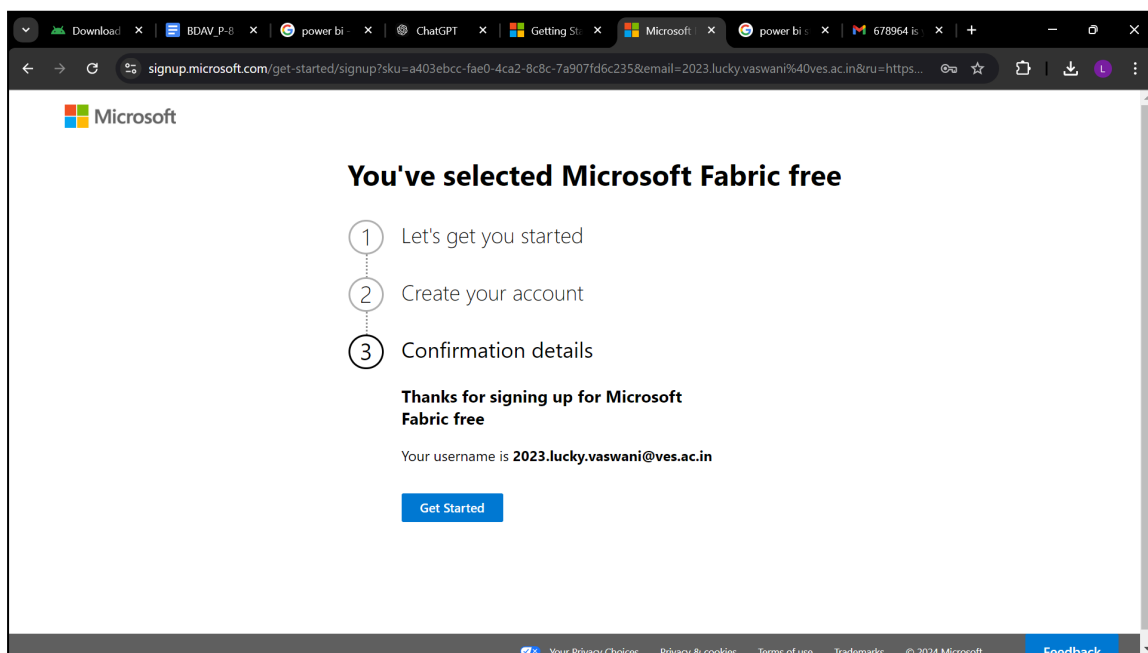
Create an Education Account (Optional)

If your school has an Office 365 account, you may already have access to Power BI as part of your subscription.

You can access educational discounts or free trials by registering with your institution's email on the **Office 365 Education** page.

Conclusion:

In conclusion, the practical exercise of installing and configuring Power BI for educational usage was successfully completed, providing valuable insights into its installation process and configuration settings. The setup was straightforward, requiring minimal technical expertise, and the educational version allowed access to essential features such as data import, report creation, and visualization tools. This practical demonstrated Power BI's potential as an effective tool for analyzing academic data, enabling students and educators to explore its powerful capabilities for generating interactive reports, dashboards, and visualizations that enhance learning and decision-making in educational environments.