**Most significant Big Data an AI analysis tools in Azure**

1. **Azure Synapse Analytics**
   - It is an integrated analytics service combining Big Data and Data Warehousing.
   - It has unified workspace for querying both relational and non-relational data.
   - Supports T-SQL, Apache Spark and serverless data exploration.
   - Integrates with Power BI, Azure Data Lake and Azure ML

2. **Azure Data Lake Storage**
   - It is highly scalable and secure data lake for high-throughput analytics workloads
   - It is optimized for big data frameworks like Spark and Databricks
   - Supports hierarchical namespaces and fine-grained security
   - It is used for storing structured and unstructured data for advanced analytics pipelines

3. **Azure Databricks**
   - It is a fast and collaborative Apache Spark-based platform optimized for AI and ML.
   - It has built-in collaborative notebooks
   - It is optimized for ML model training, data engineering and real-time analytics
   - It has a deep integration with Azure ML and is mainly used for running large-scale ML models, real-time stream processing and ETL pipelines

4. **Azure Machine Learning**
   - It is comprehensive ML-as-a-service for building, training and deploying ML models
   - It has automated ML, drag and drop UI and Python SDKs, MLOps capabilities with versioning and deployment pipelines, integration with Azure Kubernetes Service for scalable deployment.
   - It is used for model training, hyperparameter tuning and managing the ML lifecycle

5. **Azure HDInsight**
   - It is a cloud-based service for open-source analytics such as Spark and Kafka.
   - It has managed clusters for scalable big data processing and support for real-time stream and batch data processing.
   - It has integration with Power BI and other Azure services
   - It is used for batch processing, log analytics and large-scale data transformation

6. **Power BI**
   - It is a Business Intelligence platform for interactive data visualization and reporting
   - It has direct integration with Azure ML and Databricks
   - Supports AI-driven insights and provides real-time dashboards
   - It is used for creating dashboards

7. **Azure Stream Analytics**
   - It is a real-time analytics and complex event processing engine
   - It has SQL-like query language for real-time data streams
   - Integrates with IoT Hub and Azure ML and is scalable to millions of events per second

**PoC na wykrycie anomalii z linii produkcyjnej**

1. Azure Iot Hub – źródło danych, zadania:
   - Zbieranie danych z czujników i urządzeń na linii produkcyjnej
   - Obsługa komunikacji w czasie rzeczywistym
2. Strumieniowanie danych – Azure Stream Analytics, zadania:
   - Analiza danych w czasie rzeczywistym
   - Możliwość wykrywania reguł anomalii
3. Przechowywanie danych – Azure Data Lake Storage, zadania:
   - Dane surower zpaisywane do późniejszej analizy offline
   - Możliwość integracji z Databricks
4. Zaawansowana analiza – Azure Databricks, Azure ML, zadania:
   - Użycie ML do wykrywania anomalii z danych historycznych
   - Trening modelu w Databricks i deployment do Azure ML
5. Wizualizacja – Power BI, zadania:
   - Dashboard pokazujący wskaźniki anomalii i ostrzeżenia lub alerty
6. Alerty – Azure Monitor, zadania:
   - Wysyłka alertów do operatora, w przypadku wykrycia anomalii