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| **Batch: B1 Roll No.: 16010121045**  **Experiment / assignment / tutorial No.\_\_\_\_\_\_\_**  **Grade: AA / AB / BB / BC / CC / CD /DD**  **Signature of the Staff In-charge with date** |

Experiment No: 7

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| Title: SQL Server on Windows Azure Virtual Machines |

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| **Aim and Objective of the Experiment:** |
| SQL Server on Windows Azure Virtual Machines |

**Abstract**:

SQL Server on Azure Virtual Machines (VMs) provides a cloud-based solution for deploying full versions of SQL Server without the need for managing on-premises hardware. This service simplifies licensing costs through a pay-as-you-go model and offers flexibility in terms of geographic regions and machine sizes. The virtual machine image gallery allows users to select the appropriate version, edition, and operating system for their SQL Server workloads. This overview covers the essentials of setting up, connecting to, and managing SQL Server on Azure VMs, including data migration, storage configuration, performance optimization, and pricing guidance. It also discusses related Azure products and services that enhance the SQL Server on Azure VM ecosystem, such as Windows virtual machines, Azure Storage, and networking solutions. Additionally, it highlights resources for troubleshooting common issues and optimizing SQL Server performance on Azure VMs, including the SQL Server IaaS Agent extension and Azure Monitor Metrics.

**Related Theory: -**

**Introduction to SQL Server on Azure Virtual Machines**

SQL Server on Azure Virtual Machines (VMs) represents a significant shift in the deployment and management of SQL Server databases. This service allows organizations to leverage the full capabilities of SQL Server in the cloud, without the need for onpremises hardware management. This approach simplifies licensing costs through a payas-you-go model and offers flexibility in terms of geographic regions and machine sizes, making it a suitable option for a wide range of SQL Server workloads [1].

**Integration with Azure Ecosystem**   
SQL Server on Azure VMs is deeply integrated into the Azure platform, enabling seamless interaction with other Azure services. This integration includes Windows virtual machines, Azure Storage, and networking solutions, which collectively enhance the overall performance, scalability, and manageability of SQL Server deployments on Azure. The SQL Server IaaS Agent extension, for instance, automates management tasks and optimizes performance, while Azure Monitor Metrics provides insights into the health and performance of SQL Server VMs [1].

**Deployment and Management**

Deploying SQL Server on Azure VMs involves several steps, including creating the VM, connecting to it, migrating data, configuring storage, optimizing performance, and understanding pricing. The Azure portal, Azure PowerShell, and ARM templates offer various methods for creating and managing SQL Server VMs. Additionally, there are resources available for troubleshooting common issues and optimizing performance, such as the Performance best practices checklist and the FAQ section [1].

**High Availability and Disaster Recovery**High availability and disaster recovery are critical aspects of any SQL Server deployment. Azure provides mechanisms for ensuring that SQL Server VMs are highly available and can recover from failures. This includes running N-tier applications in multiple Azure regions for high availability and using Azure's built-in tools for backup and recovery [2].

**Performance Optimization**

Optimizing the performance of SQL Server on Azure VMs is crucial for achieving the best price-performance ratio. This involves fine-tuning the VM size, storage configuration, and SQL Server settings. Tools like PerfInsights can help evaluate resource health and troubleshoot performance issues, while the SQL Assessment feature provides recommendations for optimally configuring SQL Server on Azure VMs [1].

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| Refer to the lab instruction and add your screenshots |
| 2.Connecting to microsoft SQL Studio |

**Conclusion:-**

SQL Server on Azure VMs offers a powerful and flexible solution for deploying and managing SQL Server databases in the cloud. By leveraging the Azure ecosystem and following best practices for deployment, management, and optimization, organizations can achieve high performance, scalability, and reliability for their SQL Server workloads.