1- Azure Virtual Machines

- VMs provide infrastructure as a service (IaaS) in the form of a virtualized server and can be used in many ways.
- Just like a physical computer, you can customize all of the software running on your VM. VMs are an ideal choice when you need:
  - Total control over the operating system (OS).
  - The ability to run custom software.
  - To use custom hosting configurations.
- An Azure VM gives you the flexibility of virtualization without having to buy and maintain the physical hardware that runs the VM.
- As an IaaS offering, you still need to configure, update, and maintain the software that runs on the VM.

Scale VMs in Azure

- You can run single VMs for testing, development, or minor tasks.
- Or you can group VMs together to provide high *availability*, *scalability*, and *redundancy*.
- Azure can also manage the grouping of VMs for you with features such as *scale sets* and *availability sets*.

Virtual machine scale sets

- ! Scale sets allow you to centrally *manage*, *configure*, and *update* a large number of VMs in minutes.
- The number of VM instances can automatically increase or decrease in response to demand
- you can set it to scale based on a defined schedule.
- Virtual machine scale sets also automatically deploy a load balancer to make sure that your resources are being used efficiently.

Virtual machine availability sets

- ! Tool to help you build a more resilient, highly availability environment.
- Availability sets are designed to ensure that VM's stagger updates, and have varied power and network connectivity, preventing you from losing all your VMs with a single network or power failure.

- Availability sets do this by grouping VM's in *2 ways*
  1. Update Domain
  2. Fault Domain

Update Domain

- distributes VMs across multiple update domains. An update domain is a logical group that ensures that not all VMs in an Availability Set are updated or rebooted at the same time during planned maintenance.
- This further enhances the availability of your application because it reduces the risk of all VMs being offline simultaneously.

Fault Domain

- distributes the VM's across multiple fault domains.
- A fault domain is a group of physical hardware within an azure datacenter

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- ! fault domains are focused on handling unexpected failures, while update domains are used for planed maintenances and updates.