**Azure fundamental assignment 1**

1. *What is cloud computing? What is Azure?*

Cloud computing is the on-demand delivery of IT resources over the Internet with pay-as-you-go pricing. Instead of buying, owning, and maintaining physical data centres and servers, you can access technology services, such as computing power, storage, and databases, on an as-needed basis from a cloud provider like Azure, AWS. Microsoft provides cloud platform known as Azure which has more than 200 products and cloud services designed to help solve existing problem and challenges.

1. *How to create an Azure account list the steps and requirements?*

Key requirement to create an Azure account is-

* 1. One should have a credit card, an email address and phone number
  2. If one does not have a credit card, then can register using a valid student college email ID.

Steps to create Azure Free Trial account-

* 1. Go to azure.microsoft.com and click on Free Account or Try Azure for free button
  2. Sign-in/Sign-up for a Microsoft account using an email address and password.
  3. Enter your Country/Region and Date of Birth and click next.
  4. Enter the verification code received on the email address and click next.
  5. Type the captcha you see on your screen and click on next.
  6. You will be redirected to the Azure Sign-up page. Enter your Region, Name, Phone number, Email address. Note: You should use the same email address for Azure sign-up and for the Microsoft account.
  7. Verify your phone number by clicking Text Me or Call Me and enter the verification code received.
  8. Enter the payment details. Make sure you have a Master Card/American Express/ Visa Credit card and international payments should be enabled.
  9. Check the Terms and Conditions and click Sign-up.
  10. You would have successfully created a Microsoft Azure free account and now have a balance of $200.
  11. Click on Portal on the top right corner of the screen. You should be redirected to the Azure portal.
  12. If you have exhausted your free credit, then you must move to the Pay as you go subscription policy. If you have crossed the limit or time limit, then you will get your subscription is disabled and cannot perform operations until its re-enabled.
  13. You cannot create multiple Microsoft azure free accounts or after one account expires to another account for free credit of 200$ using a single Credit card.

1. *Describe different types of cloud models.*

There are 2 types of Cloud Models – Service Model and Deployment Model.

* 1. *Service Models* – There are 3 types of service model in cloud as Infrastructure as a Service (IAAS), Platform as a Service (PAAS) and Software as a Service (SAAS).

*IAAS*- This is the most used cloud computing service model owing to its structural support that includes virtual servers, operating systems, network, and data storage drives. The IaaS model caters to the businesses’ basic need for scalability, flexibility, and reliability vis-a-vis the cloud, as well as obliterates the need for maintaining hardware in the office space. It is a completely outsourced service that operates on a pay-for-use model and is available in private, public, and hybrid infrastructure formats.

*PAAS*- This cloud computing model deploys software and infrastructure framework offered by the cloud service providers with room for businesses to develop and run applications of their own as well. PaaS clouds are developed within IaaS clouds in many cases by specialists with a view of scaling the process of application deployment, making the users’ expenses highly predictable. With PaaS, web applications can be developed with ease and in a time efficient manner, and the cloud service carries the requisite robustness and flexibility to support the process.

*SAAS*- In this service model, applications leverage the cloud for software architecture, thus, cutting back significantly on burdens of operations, support, and maintenance. This is made possible by running applications on vendor computer as opposed to that of the user. This service makes software available to various users over the internet who, then pay for it either by signing up for a subscription or via a pay-per-use model.

* 1. *Deployment Models* – There are 3 types of deployment models as Public, Private, Hybrid.

*Public cloud* is open to all to store and access information via the Internet using the pay-per-usage method. In public cloud, computing resources are managed and operated by the Cloud Service Provider (CSP). Example: Amazon elastic compute cloud (EC2), IBM SmartCloud Enterprise, Microsoft, Google App Engine, Windows Azure Services Platform.

*Private cloud* is also known as an internal cloud or corporate cloud. It is used by organizations to build and manage their own data centres internally or by the third party. It can be deployed using Opensource tools such as Openstack and Eucalyptus.

*Hybrid cloud* is a combination of the public cloud and the private cloud.

1. *Describe different cloud services.*

There are different cloud services provided by Azure such as –

*1.Compute*:

Azure compute provides the infrastructure you need to run your apps. Tap in to compute capacity in the cloud and scale on demand. Containerise your applications, deploy Windows and Linux virtual machines (VMs) and take advantage of flexible options for migrating VMs to Azure. With comprehensive support for hybrid environments, deploy how and where you want to. Azure compute also includes a full-fledged identity solution, so you gain managed end-point protection and Active Directory support which helps secure access to on-premises and cloud apps. Deploy great apps and save with pay-as-you-go pricing, and the Azure Hybrid Benefit.

*2.Networking:*

Connect cloud and on-premises infrastructure and services to provide your customers and users the best possible experience. Azure provides the scale, performance, high availability, and enterprise-grade security you need to meet your most extreme workload requirements. Deliver consistent, low-latency experience to your customers through services that work across on-premises, multi-cloud, and edge location seamlessly. Focus on delivering your application logic when you use network-as-a-service offerings from Azure Networking.

*3.Software applications:*

Quickly build and deploy your web applications using a fully managed platform, without the burden of managing infrastructure.

*4.Security:*

Protect your enterprise from advanced threats across hybrid cloud workloads. Protect data, apps and infrastructure quickly with built-in security services in Azure that include unparalleled security intelligence to help identify rapidly evolving threats early—so you can respond quickly. Implement a layered, defence in-depth strategy across identity, data, hosts and networks. Unify security management and enable advanced threat protection across hybrid cloud environments.

*5.Data Storage:*

Get cloud storage which provides a set of highly scalable, secure, performant and cost-effective foundation to run all your business applications.

1. *What are some cloud computing advantages?*

Some important advantages of Cloud Computing are-

1. Back-up and restore data

Once the data is stored in the cloud, it is easier to get back-up and restore that data using the cloud.

2) Improved collaboration

Cloud applications improve collaboration by allowing groups of people to share information quickly and easily in the cloud via shared storage.

3) Excellent accessibility

Cloud allows us to access store information anywhere, anytime quickly and easily in the whole world, using an internet connection. An internet cloud infrastructure increases organization productivity and efficiency by ensuring that our data is always accessible.

4) Low maintenance cost

Cloud computing reduces both hardware and software maintenance costs for organizations.

5) Mobility

Cloud computing allows us to easily access all cloud data via mobile.

6) iServices in the pay-per-use model

Cloud computing offers Application Programming Interfaces (APIs) to the users for access services on the cloud and pays the charges as per the usage of service.

7) Unlimited storage capacity

Cloud offers us a huge amount of storing capacity for storing our important data such as documents, images, audio, video, etc. in one place.

8) Data security

Data security is one of the biggest advantages of cloud computing. Cloud offers many advanced features related to security and ensures that data is securely stored and handled.

1. *Differentiate Capital expenses vs. operating expenses*

*Capital expenditure (CapEx)* is the amount an organization spends towards fixed resources, like maintenance of equipment, building, vehicles, or maybe land. In short, you may also call that PP&E i.e., Property, plant, and equipment.

These are basically one-time purchases intended to benefit the organization for at least a year. In the IT world, instances of these significant items include frameworks, servers, supporting things like Universal Power Systems (UPS), air conditioners, line printers, scanners, and generators, etc.

*Operating expenses (OpEx)* include the funding to support day-to-day business expenses. OpEx items are those that get used up within a year they are bought. For e.g., printer cartridges, electricity, website hosting, web domain registrations, paper, power, etc.

Capital expenditures (CapEx) are the long-term expenses while operating expenses (OpEx) are the day-to-day expenses.

|  |  |  |
| --- | --- | --- |
|  | CapEx | OpEx |
| Purpose | Buy assets with useful life greater than current year. | Ongoing costs to run the business. |
| When paid | Upfront | Monthly or yearly |
| When accounted for | Over useful life (3-10 years) as asset depreciates | In the current month or year |
| Listed as | Depreciation, equipment, or property | Operating cost |
| Tax Treatment | Deducted over time as the asset depreciates | Deducted in current tax year |
| Example | Buying new server hardware and software for datacentre | Infrastructure-as-a-Services (IaaS) offering from Azure, AWS |