Microsoft AI-102

Cognitive services (Module 2)

Cognitive services are wide range of AI capabilities to be used in Applications.
↳ accessed through endpoint (specific Url) & subscription Key

⇒ End point : HTTP address through which REST interface can access the service
↳ REST : representational state transfer : Kind of API architectu
↳ API : set of definitions & protocols for building & integrating app. sw (contract between the information provider & user)
↳ as submitting data in JSON format over an HTTP request.
↳ The data could be POST, PUT, GET requests depends on the function being called.
↳ SDK : software development Kit ; It includes packages that can be installed to use service-specific libraries.

Azure Active Directory : Cloud-based identity and access manag. service
↳ Tenant : represents an organization that has specific domain name and ID, each tenant can include multiple applications & users. A tenant is a dedicated instance of Azure AD that will contain the resource groups & apps.

Tenant (AAD) → Resource groups → Resources (services)
↳ Tenant ID ↳ Subscription ID ↳ End point & Key
manages app's access identity ← Service principal ← application
↳ object ID ↳ app ID & pass & Name

To access Key Vault via an application, we ~~add~~ give the object ID of the service principal ~~in~~ the permission to access the Key Vault by specific way (get - push .. etc)

Azure Key Vault : azure service to store Keys & passwords. The access to it is granted to security principles

To regenerate the primary subscription key for a cog. ser :
⇒ it is preferred to switch the apps to use the secondary key to minimize the service interruption while the regeneration.

Azure alerts : used to configure notifications for resources
Azure Monitor : collect metrics for resources at regular intervals to track indicators of resources.
Diagnostic logging : capture rich operational data, which can be used to analyze usage & troubleshoot problems.

Container : resource that encapsulates the necessary runtime components for a specific app or service in an "image".
↳ Containers make the app portable across hosts as it no more depends on the OS or the HW.
⇒ Local containers can be host on Docker server, while on the cloud can be Azure container instance (ACI) or Azure Kubernetes service (AKS) cluster.
Container image : is unchangeable file that is used to construct the run-time environment for the application. Containers need to run an image to exist.
⇒ Cog. Service Container images : each provides a subnet of Cog Ser. functionality. Images can be used on cloud containers or pulled on a local device ⇒ Access : Container endpoint only, No Key.
↳ Configurations : Connect Container for Cog. Ser. resource via Key & Endpoint.

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Cognitive Service (Text) (M3)

Text Analytics : a cognitive service that provides advanced NLP over raw text . Ex : language detection , sentiment analysis ...

⇒ text analytics supports multi-service & single-service access

- create a Cog. ser. resource for multi-services under single end point & authenticate the text service only
- create a text analytics resource for a single-service.

Sentiment analysis : quantify how postive or negative the text is.

Named entity recognition : detect references to entities (people , locations ...)

Entity linking : identify specific entities by providing reference links

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Detect language ⟶ Extract key phrases / Analyze sentiment / Extract entities / Extract linked entities.

language is prerequisite ⟵

Translator : a cognitive service that provides a multilingual text translation API ; It also supports multi-service & single-ser

- Multiservice through connecting the cognitive service to the regional translator resource
  - this method requires the key & location of the Cog.ser. to be written in the header of the JSON file sent to the regional translator end-point
    - Key to ensure subscription & location to connect to the closer regional translator.

⇒ Translator Vs Transliteration : translitration converts the phonetic of word from language to another.

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Cog. Ser. (speech) (44):

Speech service : Speech ⇄ Text, Speech translation, Speaker recognation, Intent recognation.

⇒ Speech service is available as multi-service & single-service

↳ Just like text-analytics, to be used as multi-service, we build the Cog. Ser. & authenticate the speech service on it.

↳ This is exactly how multi-service is done : by connecting or authenticating many services to the same Cog. ser. using the same end point.

Speech-to-text API : ↔ 1- short audios : up to 60 seconds.

↳ 2- Primary : for longer audios or batch (group) transcription.

⇒ Proxy server : is a server application that act as an intermediary between the client and a resource.

⇒ Using Speech ⇄ text : we create proxy client for Azure resource & this is named SpeechRecognizer / SpeechSynthesizer object.

↳ Speech synthesizer : generates spoken language by machine on the basis of written input.

↳ Config. options : different voices, styles, & roles that affect the tone

↳ Speech synthesis markup language : (SSML) :

↳ specify a speaking style

↳ Phonemes : phonetic pronciations

↳ Prosody : pitch, timbre, speaking rate