Assignment 2

You are asked to create the following network on the cloud using the Azure platform.

**Virtual Network Design**

Start with a class A network (e.g. 10.0.0.0) and create a virtual network with several subnets according to the specifications below:

* The virtual network should be defined with a subnet mask that allows a maximum of 8192 IP addresses.

\_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ | = 32 bit

2^13 = 8192, so 32-13 = 19

Vnet = 10.5.0.0\19

* A subnet (subnet-1) that allows a maximum of 1800 IP addresses.

\_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ || \_ \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ = 32 bit

2^11 = 2048, so 32-11 = 21

Vs1 = 10.5.0.0\21

* A subnet (subnet-2) that allows a maximum of 1500 IP addresses.

\_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ | \_ 1 | \_ \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ = 32 bit

2^11 = 2048, so 32-11 = 21

Vs2 = 10.5.8.0\21

* A subnet (subnet-3) that allows a maximum of 800 IP addresses.

\_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ | 1 \_ \_ | \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ = 32 bit

2^10 = 1024, so 32-10 = 22

Vs3 = 10.5.16.0\22

* Two subnets (subnet-4 and subnet-5) where each allow a maximum of 300 IP addresses.

\_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ | 1 \_ 1 \_ | \_ . \_ \_ \_ \_ \_ \_ \_ \_ = 32 bit

2^9 = 512, so 32-9 = 23

Vs4 = 10.5.20.0\23

\_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ \_ \_ \_ \_ \_ . \_ \_ \_ | 1 \_ 1 1 | \_ . \_ \_ \_ \_ \_ \_ \_ \_ = 32 bit

2^9 = 512, so 32-9 = 23

Vs5 = 10.5.22.0\23

**Virtual Machines**

Provision two virtual machines according to the following specifications:

* Virtual machine VM-1:
  + Using the Windows Server 2016 operating system
  + Allocated on subnet-1
  + Running the IIS Web server
* Virtual machine VM-2:
  + Using the Windows Server 2016 operating system
  + Allocated on subnet-2
  + The Java Development Kit (JDK version 8) installed

**Network Security Groups**

Define a network security group (NSG) for each of the two subnets, subnet-1 and subnet-2 called NSG-1 and NSG-2, respectively. Apply the following rules for each NSG:

* NSG-1: RDP (port 3389) and Web (port 80) access from anywhere.
* NSG-2: RDP access from anywhere.

**Database**

Provision an SQL database according to the specifications in Assignment #1. The database server should only be accessible through any virtual machine allocated on subnet-2. No other access to the database should be allowed.

The database should have the following four tables:

* Customer:
  + ID: a unique identifier for a customer (Primary Key)
  + Name: the name of the customer
  + Address: the address of the customer
  + CreditLimit: the maximum credit for customer
* Product:
  + ID: the unique identifier for product (Primary Key)
  + Name: the name of the product
  + Quantity: the number of items in stock
  + Price: the sale price for product
* PurchaseOrder:
  + ID: a unique identifier associated with a purchase order (Primary Key)
  + CustomerID: the ID of the customer
  + POnumber: alphanumeric characters identifying a purchase order
  + Date: the date of the purchase order creation
* PurchasedItems:
  + ID: unique id (Primary Key)
  + PurchaseOrderID: integer (reference to ID in the PurchaseOrder table)
  + ProductID: integer (reference to ID in the Product table)
  + Quantity: integer

**Application**

On the virtual machine VM-2 you should have Java programs that demonstrate the ability to execute queries on the database.