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FALL 2018_Microsoft SQL Server Database (CPD222)
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Index and Storage assignment, Week 8
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A script to create a non-clustered index for HireDate on HumanResources.Employee in the Adventure Works database:

```
USE [AdventureWorks2012]
GO
```

```
/****** Object:  Index [IX_HireDate_NonClsd]    Script Date: 10/16/2018 6:17:07 PM
******/
CREATE NONCLUSTERED INDEX [IX_HireDate_NonClsd] ON [HumanResources].[Employee]
(
    [HireDate] ASC
)WITH (PAD_INDEX = OFF, STATISTICS_NORECOMPUTE = OFF, SORT_IN_TEMPDB = OFF, DROP_EXISTING
= OFF, ONLINE = OFF, ALLOW_ROW_LOCKS = ON, ALLOW_PAGE_LOCKS = ON) ON [PRIMARY]
GO
```

1. Explain Page Splits.

Page split happens to keep balance on the distribution of the data. B-tree structure constraint to keep all nodes length equal.

In every extent there are 8 pages(64KB data per page) contains data rows(up to 8KB per row),

When the page is full and new record added, a new page will created, but when a new record inserted in a page has been already full, a page split will happen and at this point :

- New page will created
- Migrating rows from the existing page to the new page
- Adding the new record to the one of the pages
- Creating a new entry in the parent node

2. What is a B-Tree - specific to SQL Server?

Every table in the database stored the data in a B-tree structure. B-tree structure make easier to find a particular piece of information. B-tree starts with root node (node corresponds to a page in storage), this root node points at intermediate (non-leaf) nodes which are points to another non-leaf nodes or to leaf nodes in order to find the actual data. B-tree structure keep the table index balanced by applying constraints on nodes length (all branches of the tree have to have the same length).

3. What are XML Indexes?

They are indexes can be created on XML data type columns, they index all tags, values and paths over the XML instances in the column and benefit query performance.

4. Can you create a secondary XML index before a primary XML index has been created?

No, we can't. The primary XML index should be created in order to create the secondary XML index

5. What indexes are already on Person.Address in the Adventure Works db? What type of indexes are these (clustered?)?

- The indexes on Person.Address table in the Adventure Work database are:
AK_Address_rowguid
IX_Address_AddressLine1_AddressLine2_City_StateProvinceID_PostalCode
IX_Address_StateProvinceID
PK_Address_AddressID
- Types of indexes:
PK_Address_AddressID is a clustered index and the other three are non-clustered indexes.