

Conventions in Entity Framework Core

Conventions are default rules using which Entity Framework builds a model based on your domain (entity) classes. In the <u>First EF Core Application</u> chapter, EF Core API creates a database schema based on domain and context classes, without any additional configurations because domain classes were following the conventions.

Consider the following sample entities and context class to understand the default conventions.

```
public class Student
{
    public int StudentId { get; set; }
    public string FirstName { get; set; }
    public string LastName { get; set; }
    public DateTime DateOfBirth { get; set; }
    public byte[] Photo { get; set; }
    public decimal Height { get; set; }
    public float Weight { get; set; }
    public int GradeId { get; set; }
    public Grade Grade { get; set; }
}
public class Grade
{
    public int Id { get; set; }
    public string GradeName { get; set; }
    public string Section { get; set; }
    public IList<Student> Students { get; set; }
}
public class SchoolContext : DbContext
{
    protected override void OnConfiguring(DbContextOptionsBuilder optionsBuilder)
    {
optionsBuilder.UseSqlServer(@"Server=.\SQLEXPRESS;Database=SchoolDB;Trusted Connection
    }
    public DbSet<Student> Students { get; set; }
}
```

Let's understand the EF Core conventions and how EF Core API will create a database for the above entities.

Schema

EF Core will create all the database objects in the **dbo** schema by default.



Table

EF Core will create database tables for all <code>DbSet<TEntity></code> properties in a context class with the same name as the property. It will also create tables for entities which are not included as <code>DbSet</code> properties but are reachable through reference properties in other <code>DbSet</code> entities. For the above example, EF Core will create the <code>Students</code> table for <code>DbSet<Student></code> property in the <code>SchoolContext</code> class and the <code>Grade</code> table for a <code>Grade</code> property in the <code>Student</code> entity class, even though the <code>SchoolContext</code> class does not include the <code>DbSet<Grade></code> property.

```
public class Student

☐ SchoolDB

   public int StudentId { get; set; }
                                                                      Database Diagrams
   public string FirstName { get; set; }

☐ ☐ Tables

   public string LastName { get; set; }
   public DateTime DateOfBirth { get; set; }
                                                                         System Tables
   public byte[] Photo { get; set; }
                                                                         public decimal Height { get; set; }
                                                                         dbo.__EFMigrationsHistory
   public float Weight { get; set; }
                                                                       🗻 🖪 🔟 dbo.Grade
   public int GradeId { get; set; }
                                                                         dbo.Students
   public Grade Grade { get; set; }
public class SchoolContext : DbContext
   protected override void OnConfiguring(DbContextOptionsBuilder optionsBuilder)
       optionsBuilder.UseSqlServer(@"Server=.\SQLEXPRESS;Database=SchoolDB;Trusted
   protected override void OnModelCreating(ModelBuilder modelBuilder)
   }
   public DbSet<Student> Students { get; set; }
```

Column

EF Core will create columns for all the scalar properties of an entity class with the same name as the property, by default. It uses the reference and collection properties in building relationships among corresponding tables in the database.

```
☐ SchoolDB

                                                                                                                                                                                                                          Database Diagrams

☐ Tables

                                                                                                                                                                                                                                  System Tables

⊕ ileTables

                                                                                                                                                                                                                                  dbo._EFMigrationsHistory

☐ dbo.Grade

   public class Grade

☐ ☐ Columns

                                                                                                                                                                                                                                                🔫 Id (PK, int, not null)
                public int Id { get; set; }

→ II GradeName (nvarchar(max), null)
                public string GradeName { get; set; } =
                                                                                                                                                                                                                                                 Section (nvarchar(max), null)
                public string Section { get; set; };
                                                                                                                                                                                                                                          public IList<Student> Students { get; set; }
                                                                                                                                                                                                                                          Constraints
                                                                                                                                                                                                                                          Triggers
                                                                                                                                                                                                                                          Indexes

⊕ Image: Book of the state of the state
                                                                                                                                                                                                                                  dbo.Students
public class Student

☐ Columns

            public int StudentId { get; set; }=

§ StudentId (PK, int, not null)

            public string FirstName { get; set; }=

    DateOfBirth (datetime2(7), not null)

            public string LastName { get; set; }=
                                                                                                                                                                                                                                                     TirstName (nvarchar(max), null)
            public DateTime DateOfBirth { get; set; }
                                                                                                                                                                                                                                                           GradeId (FK, int, not null)
            public byte[] Photo { get; set; }-
                                                                                                                                                                                                                                                        Height (decimal(18,2), not null)
            public decimal Height { get; set; }
                                                                                                                                                                                                                                                          LastName (nvarchar(max), null)
            public float Weight { get; set; }*
                                                                                                                                                                                                                                                      Photo (varbinary(max), null)
            public int GradeId { get; set; }
                                                                                                                                                                                                                                                     Weight (real, not null)
            public Grade Grade { get; set; }
```

Column Data Type

The data type for columns in the database table is depending on how the provider for the database has mapped C# data type to the data type of a selected database. The following table lists mapping between C# data type to SQL Server column data type.

C# Data Type	Mapping to SQL Server Data Type		
int	int		
string	nvarchar(Max)		
decimal	decimal(18,2)		
float	real		
byte[]	varbinary(Max)		

datetime	datetime
bool	bit
byte	tinyint
short	smallint
long	bigint
double	float
char	No mapping
sbyte	No mapping (throws exception)
object	No mapping

ADVERTISEMENT

Nullable Column

EF Core creates null columns for all reference data type and nullable primitive type properties e.g. string, Nullable<int>, decimal?.

NotNull Column

EF Core creates NotNull columns in the database for all primary key properties, and primitive type properties e.g. int, float, decimal, DateTime etc..

Primary Key

EF Core will create the primary key column for the property named Id or <Entity Class Name>Id (case insensitive). For example, EF Core will create a column as PrimaryKey in the Students table if the Student class includes a property named id, ID, iD, Id, studentid, StudentId, STUDENTID, or sTUdentID.

```
☐ SchoolDB

                                                                                                                                                                                                                           Database Diagrams

☐ Iables

                                                                                                                                                                                                                                  System Tables

⊕ ileTables

■ dbo._EFMigrationsHistory

                                                                                                                                                                                                                                   dbo.Grade
   public class Grade
                                                                                                                                                                                                                                           □ Columns
                                                                                                                                                                                                                                                   → PId (PK, int, not null)
                public int Id { get; set; } =
                                                                                                                                                                                                                                                          GradeName (nvarchar(max), null)
                public string GradeName { get; set; }
                public string Section { get; set; }
                                                                                                                                                                                                                                                          Section (nvarchar(max), null)

⊕ Image: Book of the Book
                public IList<Student> Students { get; set; }
                                                                                                                                                                                                                                           Triggers
                                                                                                                                                                                                                                           Indexes
                                                                                                                                                                                                                                           public class Student
                                                                                                                                                                                                                                  dbo.Students

☐ Columns

             public int StudentId { get; set; }=
                                                                                                                                                                                                                                                  § StudentId (PK, int, not null)
            public string FirstName { get; set; }
                                                                                                                                                                                                                                                          DateOfBirth (datetime2(7), not null)
            public string LastName { get; set; }
                                                                                                                                                                                                                                                          FirstName (nvarchar(max), null)
            public DateTime DateOfBirth { get; set; }
                                                                                                                                                                                                                                                          GradeId (FK, int, not null)
            public byte[] Photo { get; set; }
                                                                                                                                                                                                                                                          Height (decimal(18,2), not null)
            public decimal Height { get; set; }
                                                                                                                                                                                                                                                          LastName (nvarchar(max), null)
            public float Weight { get; set; }
                                                                                                                                                                                                                                                          Photo (varbinary(max), null)
            public int GradeId { get; set; }
                                                                                                                                                                                                                                                          Weight (real, not null)
            public Grade Grade { get; set; }
```

Foreign Key

As per the foreign key convention, EF Core API will create a foreign key column for each reference navigation property in an entity with one of the following naming patterns.

- > <Reference Navigation Property Name>Id
- > <Reference Navigation Property Name><Principal Primary Key Property Name>

In our example (Student and Grade entities), EF Core will create a foreign key column GradeId in the Students table, as depicted in the following figure.

```
☐ II SchoolDB

public class Student Dependent Entity
                                                                  Database Diagrams
                                                                  Tables
    public int StudentId { get; set; }
                                                                    System Tables
    public string FirstName { get; set; }

⊕ ileTables

    public string LastName { get; set; }
                                                                    dbo._EFMigrationsHistory
    public DateTime DateOfBirth { get; set; }

    ⊞ dbo.Grade

    public byte[] Photo { get; set; }
                                                                    dbo.Students
    public decimal Height { get; set; }
                                                                       □ Columns
    public float Weight { get; set; }
                                                                            Studentid (PK, int, not null)
                                                                            DateOfBirth (datetime2(7), not null)
    public int GradeId { get; set; } Foreign Key Property
                                                                            FirstName (nvarchar(max), null)
    public Grade Grade { get; set; } Reference Property
                                                                            Height (decimal(18,2), not null)
                                                                            LastName (nvarchar(max), null)
                                                                            Photo (varbinary(max), null)
public class Grade Principal Entity
                                                                            Weight (real, not null)
                                                                              GradeId (FK, int, not null)
    public int Id { get; set; } Primary Key Property
    public string GradeName { get; set; }
    public string Section { get; set; }
    public IList<Student> Students { get; set; }
```

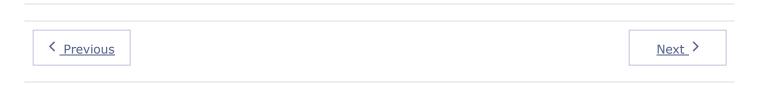
The following table lists foreign key column names for different reference property names and primary key property names.

Reference Property Name in Dependent Entity	Foreign Key Property Name in Dependent Entity	Principal Primary Key Property Name	Foreign Key Column Name in DB
Grade	GradeId	GradeId	GradeId
Grade	-	GradeId	GradeId
Grade	-	Id	GradeId
CurrentGrade	CurrentGradeId	GradeId	CurrentGradeId
CurrentGrade	-	GradeId	CurrentGradeGradeId
CurrentGrade	-	Id	CurrentGradeId
CurrentGrade	GradeId	Id	GradeId

Index

EF Core creates a clustered index on Primarykey columns and a non-clustered index on ForeignKey columns, by default.

Learn about relationship conventions in the next chapter.



ENTITYFRAMEWORKTUTORIAL

Learn Entity Framework using simple yet practical examples on EntityFrameworkTutorial.net for free. Learn Entity Framework DB-First, Code-First and EF Core step by step. While using this site, you agree to have read and accepted our terms of use and privacy policy.

TUTORIALS

- > EF Basics
- > EF Core
- > EF 6 DB-First
- > EF 6 Code-First

E-MAIL LIST

Subscribe to EntityFrameworkTutorial email list and get EF 6 and EF Core Cheat Sheets, latest updates, tips & tricks about Entity Framework to your inbox.

Email address

GO

We respect your privacy.

HOME PRIVACY POLICY ADVERTISE WITH US

© 2020 EntityFrameworkTutorial.net. All Rights Reserved.