CS544 EA

Hibernate

Mapping Data Types

Data Types

- JPA has **decent defaults** for most types
  - Java and SQL data types are not that different
  - Ints become ints, Strings become varchar(255), …
  - You can customize things (length of varchar)
- Not all types always map correctly
  - Specifically date and time related types

@Basic

- @Basic indicates that a property should be persisted and the default type should be used
  - JPA assumes these are there
    - (**you don’t have to add them**)
  - Also has options for:
    - Indicating that a property is Nullable
    - Indicating if a property should be fetched lazily

Hibernate mostly ignores this
it doesn’t make sense from an optimization point of view

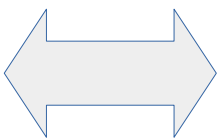
Exactly the same

```java
package cs544.hibernate01.basic;

import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.Id;

@Entity
public class Customer {
	@Id
	@GeneratedValue
	private Integer id;
	@Basic
	private String firstName;
	@Basic
	private String lastName;
	...

}
```



```java
package cs544.hibernate01.basic;

import javax.persistence.Entity;
import javax.persistence.GeneratedValue;
import javax.persistence.Id;

@Entity
public class Customer {
	@Id
	@GeneratedValue
	private Long id;
	private String firstName;
	private String lastName;

	...

}
```

@Column

- **@Column** allows us to specify several optional additional values for this column
  - Name: column name can differ from property name
  - Length: for string valued properties
  - Scale and Precision for decimal columns
  - Nullable: if the column should be nullable
  - Unique: if the column values should be unique
  - Table (for secondary tables, discussed later)
  - ColumnDefinition: raw DDL to be used for this column

```java
@Entity
public class Customer {
	@Id
	@GeneratedValue
	private Long id;
	@Column(name="first", length=45, nullable=false)
	private String firstName;
	@Column(name="last", length=60, nullable=true)
	private String lastName;

	...
}
```

Date and Time

- Legacy Date and Time related data-types allways default to the SQL type: **TimeStamp**
  - Includes: java.util.Date, java.sql.Date, java.util.Calendar
  - But you may not always want it stored as a Timestamp!

- java.time.* do not need additional annotations

See: https://www.baeldung.com/hibernate-date-time

@Temporal

- **@Temporal** lets you to specify a SQL data type by giving it a value of the TemporalType enum:
  - TemporalType.DATE
  - TemporalType.TIME
  - TemporalType.TIMESTAMP (default)

```
@Entity
public class Customer {

      ...

      @Temporal(TemporalType.DATE)
      private Date birthDate;

      ...
}
```

@Enumerated

- **@Enumerated** specifies how to store an enum
  - Default is ORDINAL
  - You only need the annotation it if you want STRING

Benefits of ORDINAL:
- Takes little storage space
- Can rename values

Downsides:
- Cannot reorder enums
- Cannot add a value between previous values

Both are valid strategies,
Personally I like STRING
So I can read data in the db

Benefits of STRING:
- Can reorder
- Can add in between
- Easier to read data in db

Downsides:
- Takes more space in DB
- Cannot rename values

@Transient

- JPA **automatically includes** all the instance variables of a class
  - Auto-maps them to columns of the same name

- What if you do not want to persist an variable?
  - @Transient specifies that it should not be stored

Large Objects

- Certain things need more space in the DB
  - Images are usually stored as BLOBs
  - Large amounts of text as CLOBs
- JPA offers the **@LOB** annotation
  - Placed on text related properties makes CLOB
  - Placed on binary related properties makes BLOB

```java
@Entity
public class Customer {
	@Id
	@GeneratedValue
	private Long id;

	@Column(name="first", length=45, nullable=false)
	private String firstName;

	@Column(name="last", length=60, nullable=true)
	private String lastName;

	@Temporal(TemporalType.TIMESTAMP)
	private Date birthDate;

	@Enumerated(EnumType.STRING)
	private CustomerType type;

	@Transient
	private String temp;

	@Lob
	private String biography;

	...
}
```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