Attribute expressions in Context

"Expressions offer a powerful way to manipulate attribute values, geometry and update the symbology of layers."

Attribute defines the characteristics of an entity. In some cases, the attributes can contain fields that allow users to dynamically change the geometry style, the content or position of the label. Expressions allow users to manipulate the attribute data and compute values on the fly that can be utilized in styling layers, labelling and updating columns.

In this module, we explore how to construct expressions to manipulate data and use it update values in columns in new columns or existing columns.

	fid	scalerank	type	sov_a3	length_km	expressway	level	
1	4090	6	Secondary Hi...	Unkown	147	0		175001,668
2	4135	8	Unknown	Unkown	22	0		23758,238
3	4136	8	Unknown	Unkown	92	0		103014,961
4	4137	8	Unknown	Unkown	17	0		18168,176
5	4138	8	Unknown	Unkown	56	0		60811,634
6	4139	8	Unknown	Unkown	58	0		60222,234
7	4140	8	Unknown	Unkown	60	0		65668,202
8	4141	8	Unknown	Unkown	6	0		6542,683
9	4142	8	Unknown	Unkown	8	0		8321,263
10	4143	8	Unknown	Unkown	5	0		5800,881
11	4144	8	Unknown	Unkown	28	0		30245,266
12	4145	8	Unknown	Unkown	26	0		26601,197
13	4146	8	Unknown	Unkown	33	0		33132,716
14	4147	8	Unknown	Unkown	47	0		49401,996
15	4148	8	Unknown	Unkown	20	0		21803,144
16	4149	8	Unknown	Unkown	32	0		34348,007

You try:

Goal: To learn how to use expressions to manipulate data

- Add the layers from the exercise data
- Toggle edit the roads layer.
- Use the field calculator to create a column *road_length* Using the options provided below.
- Use the *$length* expression to populate the column you created above. Save the edits.
  *Compare this new column with the length_km column that already exists in the attribute table. Are there any differences.
- What are the units of the length you calculated ?. Update the length of the roads from the current units it is into km and miles.

Results

You should produce an attribute table that has an extra column *road_length*

More about expressions

Expressions are extensively used in QGIS and in order for a user to become a power user, they should master them. In QGIS there is an option to write custom expressions to expand on the predefined expressions available after installing QGIS. The type of data determines the kind of expression to use. For example, if the data is numeric users might need to use mathematical expressions whilst if the data is of string type then users might need to use string expression.

Check your knowledge:

1. What is the best way to describe geometry functions:
    a. *Functions that are used to expressions when the data type is numeric*
    b. *A type of layer available in QGIS*
    c. *Group of functions which are intended to exclusively operate on the geometry of layers*

2. Which of the following can not be achieved using an expression:
    a. *Determine the length of a string*
    b. *Give statics about a column in the attribute table.*
    c. *Do an intersection between two layers using the geometry functions*

3. Can a user update selected records:
    a. *True*
    b. *False*

Further reading:

- expression-based-labeling-for-qgis: https://docs.qgis.org/2.18/en/docs/user_manual/working_with_vector/expression.html

Download the sample data for the lesson from http://changelog.inasafe.org/media/images/lesson/worksheet/external_data/fd869396b37f12f5e855f7c989949d41692f03e7.zip.