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SALAMA - Swahili Language Manager

2022-06-30

Hurskainen , A 2022 ' Self-tutored learning of Finnish subject and object case ' Technical reports on language technology , no. 84 , SALAMA - Swahili Language Manager , Helsinki .

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<http://www.njas.helsinki.fi/salama/self-tutored-learning-of-finnish-subject-and-object-case.pdf> >

<http://hdl.handle.net/10138/346508>

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Self-tutored learning of Finnish subject and object case¹

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Abstract

The development of a system for learning language structures of a language such as Finnish is a non-trivial process. In order to make the learning system general, so that any words of the language can be used in training, the system must be based on language analysis and disambiguation. Using this method, the construction of the learning system is based on the linguistic structures rather than on individual words. The analysis system should be as accurate as possible, and the tag system should cover all those features that are needed for constructing rules for each construction type. This means that the developer should have access to the development environments of analysis and disambiguation, so that corrections and amendments of the analysis and disambiguation can be done in the source code rather than in the post-processing phase.

Mastering Finnish object cases is perhaps the most difficult feature for the learner. Therefore, a system for testing the correctness of the object case in each structure should help learners, who want to learn perfect Finnish.

Key Words: *morphological analysis, disambiguation, language learning.*

1 Introduction

Finnish language has three object cases. Many grammatical descriptions use inaccurate names of these cases. It is true that the form of those cases resembles partitive, genitive or nominative cases. In fact, only partitive is an unambiguous case name. The case names genitive and nominative match only partially with the similar-looking object case forms. This can be seen especially when pronouns are in object position.

Therefore, I use the following object case names: partitive, accusative, and nominative-accusative. The tags describing these forms are PAR, ACC, and ACC-N respectively.

When we look at Finnish transitive verbs, we see that part of them get either exclusively or generally only partitive objects in basic sentences, while most verbs get partitive and accusative objects, depending on meaning. As a result, it is not possible to categorise verbs on this basis. However, it is useful to mark such verbs that get primarily partitive objects, and only seldom or never accusative objects.

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The rules when to use nominative-accusative objects can be more safely defined, although also here are such cases, where also accusative is accepted.

The subject of the sentence is normally in nominative case, but in certain structures also genitive case is used. These structures have one of the modal verbs *pitää*, *täytyy*, *tulee*, *sopii*, and the main verb in infinitive form. Also adessive appears as subject case, when the verb *olla* is used for meaning possession, such as *Minulla on nälkä*.

In order to reduce the amount of output, comments on orthography, word order and concordance were switched off. These questions were discussed in report No 83².

2 Types of example sentences

The learning system was so constructed that it recognises the key members of the sentence. These are: the subject, the object, and the predicate. For the sake of clarity, words such as adjectives and adverbs were omitted, because they have no effect on object or subject cases. The analysis system recognises these words also, but in order to simplify the rule writing, these words are not part of the learning system. The term predicate means here the finite verb form or a cluster of verbs, where a modal verb defines the function of the main verb. Also negative forms fall into this category.

3 Types of information given as feedback

Because Finnish has a large number of inflection classes for verbs, nouns and adjectives, I have implemented the learning system so that verbs and nouns appearing in sentences are given three features as feedback. These are: the basic form of the word, the stem of the word, and the inflection class of the verb. This information helps the learner figure out, how the form was constructed.

In addition to these basic stable features, also context-specific feedback is given. These include such TAM features as present, past, potential, and conditional features. Also their negative forms are recognised, as well as imperative forms.

From the point of view of learning object cases, information on the object case in each sentence type is crucial. Reporting could be done in two ways. In the first method, report on the correct object case is given only when the case of the object is wrong. If the learner has typed the correct case, no report is given, or report on its correctness is given. In the second method, report on the correct case is given regardless the case chosen by the learner. Also when the case typed is correct, the report is a reminder of the correct case. There are also cases, where partitive and accusative cases are allowed, and it is useful for the learner to know this.

The case of the subject is normally nominative, but also other cases occur. Some modal verbs require that the subject is in genitive case. One should not mix it with accusative case, which most often is identical with genitive. Partitive can also be the case of a subject. However, there are cases, where the partitive subject could also be classified as an object. Be it subject or object, it does not matter in learning structures.

² <http://www.njas.helsinki.fi/salama/rule-based-language-technology-applied-to-learning-finnish.pdf>

4 Simple sentences with one verb

We take a look at the responses, when we enter simple sentences with subject, verb and object (1).

(1)

- The INFLECTION CLASS of the verb [syödä] is V64y-f
- The STEM of the verb [syödä] is {s}.
- The verb [syödä] is in PRESENT tense form.

- The object of the verb [syödä] should be in ACCUSATIVE or PARTITIVE case. NOMINATIVE-ACCUSATIVE case is not allowed.

Minä syön ruokaa. +PRON-PERS+SG1+NOM+CAP+[minä]
+V+SG1+TRV+PRES+[syödä]+R:s+V64y-f +N+SG+PAR +[ruoka]+R:ruo+N10-D

We see that there are three, actually four, comments on the verb. These are: the inflection class, the base form, the stem, and the TAM information. We are also informed that the verb *syödä* should be in accusative or partitive form, and that the nominative-accusative form is not allowed.

Let us see what happens when we type the wrong object case (2).

(2)

- The INFLECTION CLASS of the verb [syödä] is V64y-f
- The STEM of the verb [syödä] is {s}.
- The verb [syödä] is in PRESENT tense form.

- The object of the verb [syödä] should be in ACCUSATIVE or PARTITIVE case. NOMINATIVE-ACCUSATIVE case is not allowed.

Minä syön ruoka. +PRON-PERS+SG1+NOM+CAP+[minä]
+V+SG1+TRV+PRES+[syödä]+R:s+V64y-f +N+SG+ACC-N+[ruoka]+R:ruo+N10-D

We got the same response as in (1). There could be the warning that the concordance is not correct, but such warnings are switched off, and here we concentrate on learning subject and object cases.

The negative form of the same sentence is in (3).

(3)

- The INFLECTION CLASS of the verb [syödä] is V64y-f
- The STEM of the verb [syödä] is {s}.
- The verb [syödä] is in PRESENT tense form.

- The object should be in PARTITIVE case, because a negative form precedes.

Minä en syö ruokaa. +PRON-PERS+SG1+NOM+CAP+[minä] +NEG+SG1
+V+SG3+TRV+PRES+[syödä]+R:s+V64y-f +N+SG+PAR +[ruoka]+R:ruo+N10-D

Here we get a response that the object should be partitive case, because the verb is in negative form.

Next we demonstrate the accusative forms (4).

(4)

- The INFLECTION CLASS of the verb [lukea] is V58-D
- The STEM of the verb [lukea] is {lu}.
- The verb [lukea] is in PAST tense form.

- The object of the verb [lukea] should be in ACCUSATIVE or PARTITIVE case. NOMINATIVE-ACCUSATIVE case is not allowed.

Minä luin kirjan. +PRON-PERS+SG1+NOM+CAP+ [minä]
+V+SG1+TRV+PAST+ [lukea]+R:lu+V58-D +N+SG+N9+R:kirj+ACC

The object and be in partitive case *kirjaa*, or in accusative case *kirjan*, depending on whether the book was completed or not. The form *kirjan* looks a genitive case. Let us see what happens when we put the object into plural (5).

(5)

- The INFLECTION CLASS of the verb [lukea] is V58-D
- The STEM of the verb [lukea] is {lu}.
- The verb [lukea] is in PAST tense form.

- The object of the verb [lukea] should be in ACCUSATIVE or PARTITIVE case. NOMINATIVE-ACCUSATIVE case is not allowed.

Minä luin kirjat. +PRON-PERS+SG1+NOM+CAP+ [minä]
+V+SG1+TRV+PAST+ [lukea]+R:lu+V58-D +N+PL+N9+R:kirj+ACC

We got the same comments as in (4). We see that accusative in plural *kirjat* does not seem to be the same as the genitive form *kirjojen*. Therefore, it is misleading to use the term genitive for marking accusative. They are two different cases, and they should not be mixed.

In questions the object case is the same as in affirmative sentences (6).

(6)

- The INFLECTION CLASS of the verb [maksaa] is V56
- The STEM of the verb [maksaa] is {maks}.
- The verb [maksaa] is in PRESENT tense form.

- The object of the verb [maksaa] should be in ACCUSATIVE or PARTITIVE case. NOMINATIVE-ACCUSATIVE case is not allowed.

Kuka maksaa laskun? +QUEST+SG+NOM+CAP
+V+SG3+TRV+PRES+ [maksaa]+R:maks+V56 +N+SG+ACC + [lasku]+R:lask+N1u

In negative imperative sentences the object is in the same form as in negative assertative sentences (7).

(7)

- The INFLECTION CLASS of the verb [maksaa] is V56
- The STEM of the verb [maksaa] is {maks}.
- The verb is in second person singular NEGATIVE IMPERATIVE form.

- The object of the verb [maksaa] should be in PARTITIVE case, because the verb is in negative form.

Älä maksa laskua. +NEG+CAP +V+TRV+NEG-PRES+ [maksaa] +R:maks+V56
+N+SG+PAR+ [lasku] +R:lask+N1u

The object case in imperative forms is interesting, because it depends on the type of imperative. In second person singular and plural, as well as in first person plural, the object case is nominative-accusative or partitive. In third person singular the object case is accusative or partitive (8).

(8)

- The INFLECTION CLASS of the verb [suoristaa] is V53
- The STEM of the verb [suoristaa] is {suorist}.
- The verb [suoristaa] is in second person singular IMPERATIVE form.

- The object [selkä] should be in nominative accusative case, because the verb [suoristaa] is in imperative form.

Suorista selkä. +V+SG2+TRV+IMP+CAP+ [suoristaa] +R:suorist+V53
+N+SG+ACC-N+ [selkä] +R:sel+N10-D-f

If we put the imperative into plural, we get the same response (9).

(9)

- The INFLECTION CLASS of the verb [suoristaa] is V53
- The STEM of the verb [suoristaa] is {suorist}.
- The verb [suoristaa] is in second person plural IMPERATIVE form.

- The object [selkä] should be in nominative accusative case, because the verb [suoristaa] is in imperative form.

Suoristakaa selät. +V+PL2+TRV+IMP+CAP+ [suoristaa] +R:suorist+V53
+N+PL+ACC+ [selkä] +R:sel+N10-D-f

When the imperative is in third person singular, the situation changes (10).

(10)

- The INFLECTION CLASS of the verb [syödä] is V64y-f
- The STEM of the verb [syödä] is {s}.
- The verb [syödä] is in third person singular IMPERATIVE form.

- The object [konvehti] should be in accusative or partitive case.

Hän syököön konvehdin. +PRON-PERS+SG3+NOM+CAP+ [hän]
+V+SG3+TRV+IMP+ [syödä] +R: s+V64y-f
+N+SG+ACC+ [konvehti] +R: konveh+N5-F

In the other hand, when the imperative is in negative form, the object is in partitive case on all persons (11).

- (11)
- The INFLECTION CLASS of the verb [syödä] is V64y-f
 - The STEM of the verb [syödä] is {s}.
 - The verb is in second person singular NEGATIVE IMPERATIVE form.

- The object should be in PARTITIVE case, because a negative form precedes.
Älä syö konvehtia. +NEG+CAP +V+SG2+TRV+IMP+ [syödä] +R: s+V64y-f
+N+SG+PAR+ [konvehti] +R: konveh+N5-F

When the sentence is in third person singular imperative form, the object case is the same (12).

- (12)
- The INFLECTION CLASS of the verb [syödä] is V64y-f
 - The STEM of the verb [syödä] is {s}.
 - The verb is in third person singular NEGATIVE IMPERATIVE form.

- The object should be in PARTITIVE case, because a negative form precedes.
Hän älköön syökö konvehtia. +PRON-PERS+SG3+NOM+CAP+ [hän] +NEG+
+V+SG2+TRV+IMP+QUE+ [syödä] +R: s+V64y-f
+N+SG+PAR+ [konvehti] +R: konveh+N5-F

When the verb is in passive form, the place of the object is often before the verb. The object case is nominative-accusative or partitive (13).

- (13)
- The INFLECTION CLASS of the verb [ratkaista] is V66
 - The STEM of the verb [ratkaista] is {ratkais}.

- The verb [ratkaista] is in passive form, and the object should be in NOMINATIVE-ACCUSATIVE or PARTITIVE case. ACCUSATIVE case is not allowed.

Mestaruus ratkaistaan jatkoajalla.
+N+SG+NOM+CAP+ [mestaruus] +R: mestaru+N40 +V+TRV+PASS-
PRES+ [ratkaista] +R: ratkais+V66 +N+SG+ADE+ [jatko aika] +R: a+N9-Db

5 Sentences with two verbs

Many sentences have a structure, where the predicate is formed of the main verb and another verb that modifies the function of the main verb. One type of these structures has

a verb such as *pitää*, *täytyä*, *tulla*, *sopia*, which mean the necessity or feasibility of what the main verb expresses. These modal verbs have influence on the subject and object.

The verbs, exempt for *täytyä*, have also other meanings, as the analysis result in (14) illustrates.

- (14)
- "<täytyy>"
"täytyä" V V52-F-f R:täy S:GEN PRES SG3
- "<tulee>"
"tulla" V V67 R:tul PRES SG3
"tulla" V VMOD V67 S:GEN R:tul PRES SG3
- "<pitää>"
"pitää" V VMOD V53-F-f S:GEN R:pitää INF
"pitää" V VMOD V53-F-f S:GEN R:pitää PRES SG3
"pitää" V TRV V53-F-f O:ELA R:pitää INF
"pitää" V TRV V53-F-f O:ELA R:pitää PRES SG3
- "<sopii>"
"sopia" V TRV V61-E R:so PRES SG3
"sopia" V VMOD V61-E S:GEN R:so PRES SG3

In such sentences as in (15) the disambiguation process selects modal interpretations.

- (15)
- The INFLECTION CLASS of the first verb [täytyä] is V52-F-f.
 - The INFLECTION class of the second verb [siirtää] is V54-K-f.
 - The STEM of the first verb [täytyä] is {täy}.
 - The STEM of the second verb [siirtää] is {siir}.
 - The verb [täytyä] is in PRESENT tense form.
-
- The object [auto] should be in NOMINATIVE-ACCUSATIVE or PARTITIVE case, because the modal verb [täytyä] precedes.
 - The subject [hän] must be in GENITIVE case, because the modal verb [täytyä] follows.
- Hänen täytyy siirtää auto.* +PRON-PERS+SG3+GEN:S+CAP+ [hän]
+V+SG3+S:GEN+ [täytyä]+R:täy+V52-F-f
+V+TRV+INF+ [siirtää]+R:siir+V54-K-f +N+SG+ACC-N+ [auto]+R:aut+N1o

The output above shows, that the basic information on the verbs *täytyä* and *siirtää* is given. In addition, it advises that the object should be in one of the two object cases, but not in accusative case, because a modal verb meaning necessity precedes. There is also a note on the subject, which here must be in genitive form.

What happens if we make a mistake on object case? We see this in (16).

- (16)
- The INFLECTION CLASS of the first verb [täytyä] is V52-F-f.
 - The INFLECTION class of the second verb [siirtää] is V54-K-f.
 - The STEM of the first verb [täytyä] is {täy}.

- The STEM of the second verb [siirtää] is {siir}.
- The verb [täytyä] is in PRESENT tense form.

- The object [auto] should be in nominative accusative case, because the modal verb [täytyä] precedes.

- The subject [hän] must be in GENITIVE form, because the modal verb [täytyä] follows.
Hänen täytyy siirtää auton. +PRON-PERS+SG3+GEN:S+CAP+ [hän]
+V+SG3+S:GEN+ [täytyä] +R:täy+V52-F-f
+V+TRV+INF+ [siirtää] +R:siir+V54-K-f +N+SG+ACC+ [auto] +R:aut+N1o

The same output was given as in (15). The system was constructed so that the advice on the correct object case is given regardless the object case typed in the sentence. Another type of sentences with two verbs is in (17).

(17)

- The INFLECTION CLASS of the first verb [jättää] is V53-C-f.
- The INFLECTION class of the second verb [myöntää] is V54-J-f.
- The STEM of the first verb [jättää] is {jät}.
- The STEM of the second verb [myöntää] is {myön}.
- The verb [jättää] is in PAST tense form.

- The object should be in ACCUSATIVE case. PARTITIVE or NOMINATIVE-ACCUSATIVE case is not allowed.
Kokous jätti myöntämättä vastuuvapauden.
+N+SG+NOM+CAP+ [kokous] +R:kokou+N39
+V+SG3+TRV+ [jättää] +R:jät+V53-C-f
+V+TRV+3INF+ABE+ [myöntää] +R:myön+V54-J-f
+N+SG+ACC+ [vastuuvapaus] +R:vapau+N40

When we put the sentence in negative form, we get the response as in (18).

(18)

- The INFLECTION CLASS of the first verb [jättää] is V53-C-f.
- The INFLECTION class of the second verb [myöntää] is V54-J-f.
- The STEM of the first verb [jättää] is {jät}.
- The STEM of the second verb [myöntää] is {myön}.

- The verb [jättää] is in negative form, and the object should be in PARTITIVE case. ACCUSATIVE case is not allowed.
Kokous ei jättänyt myöntämättä vastuuvapautta.
+N+SG+NOM+CAP+ [kokous] +R:kokou+N39 +NEG+SG +V+TRV+NEG-PAST-SG+ [jättää] +R:jät+V53-C-f +V+TRV+3INF+ABE+ [myöntää] +R:myön+V54-J-f
+N+SG+PAR+ [vastuuvapaus] +R:vapau+N40

Another sentence with the same meaning as in (17) has a different object case (19).

(19)

- The INFLECTION CLASS of the verb [myöntää] is V54-J-f
- The STEM of the verb [myöntää] is {myön}.

- The object should be in PARTITIVE case, because the verb is in negative form.

Kokous ei myöntänyt vastuuvapautta. +N+SG+NOM+CAP+ [kokous] +R: kokou+N39
+NEG+SG +V+TRV+NEG-PAST-SG+ [myöntää] +R: myön+V54-J-f
+N+SG+PAR+ [vastuuvapaus] +R: vapau+N40

The second verb can be in various infinitive forms (20).

(20)

- The INFLECTION CLASS of the first verb [olla] is V67b.
- The INFLECTION class of the second verb [ostaa] is V53.
- The STEM of the first verb [olla] is {o}.
- The STEM of the second verb [ostaa] is {ost}.
- The verb [olla] is in PAST tense form.

- The verb [ostaa] is in third infinitive form and means that the action is happening.

- The object [auto] of the verb [ostaa] should be in PARTITIVE case.

Hän oli ostamassa autoa. +PRON-PERS+SG3+NOM+CAP+ [hän]
+V+SG3+VMOD+BE+ [olla] +R: o+V67b +V+TRV+3INF+INE+ [ostaa] +R: ost+V53
+N+SG+PAR+ [auto] +R: aut+N1o

The object in this case should be in partitive case, because the third infinitive form with inessive case indicates that the action is currently happening, which is why partitive is the appropriate case for the object.

If the third infinitive form is in adessive case, the object gets a different case (21).

(21)

- The INFLECTION CLASS of the first verb [ylpeillä] is V67-f.
- The INFLECTION class of the second verb [ostaa] is V53.
- The STEM of the first verb [ylpeillä] is {ylpeil}.
- The STEM of the second verb [ostaa] is {ost}.
- The verb [ylpeillä] is in PAST tense form.

- The object [auto] should be in accusative case, because the verb is in third infinitive form with adessive case.

Hän ylpeili ostamalla auton. +PRON-PERS+SG3+NOM+CAP+ [hän]
+V+SG3+ [ylpeillä] +R: ylpeil+V67-f +V+TRV+3INF+ADE+ [ostaa] +R: ost+V53
+N+SG+ACC+ [auto] +R: aut+N1o

When the verb is in passive form, the object case is in accusative or partitive. This holds also in cases with participial phrase (22).

(22)

- The INFLECTION CLASS of the first verb [suunnitella] is V67-C.
- The INFLECTION class of the second verb [rakentaa] is V54-J.
- The STEM of the first verb [suunnitella] is {suunnit}.
- The STEM of the second verb [rakentaa] is {raken}.

- The object [pientaloalue] should be in accusative or partitive case, because the verb is in passive form.

Seudulle suunnitellaan rakennettavan pientaloalue.

+N+SG+ALL+CAP+ [seutu] +R: seu+N1-Fu +V+TRV+PASS-
PRES+ [suunnitella] +R: suunnit+V67-C +V+TRV+PASS-PART-
PRES+INS+ [rakentaa] +R: raken+V54-J +N+SG+ACC-
N+ [pientaloalue] +R: alu+N48

When a modal verb meaning necessity or feasibility precedes, the object is in accusative, although the verb is in passive form (23).

(23)

- The STEM of the first verb [täytyä] is {täy}.
- The STEM of the second verb [tehdä] is {te}.
- The verb [täytyä] is in PRESENT tense form.

- The object [harvennus] should be in nominative accusative case, because the verb [täytyä] precedes.

Täytyy tehdä harvennus metsässä. +V+SG3+S: GEN+CAP+ [täytyä] +R: täy+V52-
F-f +V+TRV+INF+ [tehdä] +R: te+V71-f
+N+SG+NOM+ [harvennus] +R: harvennu+N39
+N+SG+INE+ [metsä] +R: mets+N10-f

6 The case of the subject

The subject of the sentence is normally in nominative case. Also two other cases occur. When the verb olla is in possessive function, the subject case is adessive (24).

(24)

- The INFLECTION CLASS of the verb [olla] is V67b
- The STEM of the verb [olla] is {o}.
- The verb [olla] is in PRESENT tense form.

- The subject must be in ADESSIVE form.

Minulla on nälkä. +PRON-PERS+SG1+ADE+CAP+ [minä]
+V+SG+PRES+ [olla] +V67b +N+SG+NOM+ [nälkä] +R: näl+N10-D-f

The same rule applies, when the verb is in negative form (25).

(25)

- The INFLECTION CLASS of the verb [olla] is V67b

- The STEM of the verb [olla] is {o}.
- The verb [olla] is in PRESRNT tense NEGATIVE form.

- The subject must be in ADESSIVE form.

Minulla ei ole nälkä. +PRON-PERS+SG1+ADE+CAP+[minä] +NEG+SG +V+NEG-PRES+VMOD+BE+[olla]+R:o+V67b +N+SG+NOM+[nälkä]+R:näl+N10-D-f

Another exception in subject case is when one of the modal verbs meaning necessity or preferability occurs in the sentence. The subject case must be genitive (26).

(26)

- The INFLECTION CLASS of the first verb [täytyä] is V52-F-f.
- The INFLECTION class of the second verb [siirtää] is V54-K-f.
- The STEM of the first verb [täytyä] is {täy}.
- The STEM of the second verb [siirtää] is {siir}.
- The verb [täytyä] is in PRESENT tense form.

- The object [auto] should be in nominative-accusative case, because the verb [täytyä] precedes.

- The subject [hän] must be in GENITIVE form, because the modal verb [täytyä] follows.

Hänen täytyy siirtää auto. +PRON-PERS+SG3+GEN:S+CAP+[hän]
+V+SG3+S:GEN+[täytyä]+R:täy+V52-F-f
+V+TRV+INF+[siirtää]+R:siir+V54-K-f +N+SG+ACC-N+[auto]+R:aut+N10

7 Verbs with partitive object

There are in Finnish at least one thousand such verbs that require exclusively or preferably an object in partitive case. The meaning of the verb gives hints to the learner for choosing the correct object case.

The example in (27) shows the response of such verbs.

(27)

- The INFLECTION CLASS of the verb [katsoa] is V52o
- The STEM of the verb [katsoa] is {katso}.
- The verb [katsoa] is in PAST tense form.

- The object of the verb [katsoa] should be in PARTITIVE case.

Minä katsoin kuvaa. +PRON-PERS+SG1+NOM+CAP+[minä]
+V+SG1+TRV+O:PAR+PAST+[katsoa]+R:katso+V52o
+N+SG+PAR+[kuva]+R:kuv+N10

Partitive case is the only alternative with this verb. Accusative or nominative-accusative cases are not allowed.

These structures were so implemented that the same reminder of the object case is given, although the learner enters a wrong object case (28).

(28)

- The INFLECTION CLASS of the verb [katsoa] is V52o
- The STEM of the verb [katsoa] is {katso}.
- The verb [katsoa] is in PAST tense form.

- The object of the verb [katsoa] should be in PARTITIVE case.

Minä katsoin kuva. +PRON-PERS+SG1+NOM+CAP+ [minä]
+V+SG1+TRV+O: PAR+PAST+ [katsoa] +R: katso+V52o +N+SG+ACC-
N+ [kuva] +R: kuv+N10

(29)

- The INFLECTION CLASS of the verb [katsoa] is V52o
- The STEM of the verb [katsoa] is {katso}.
- The verb [katsoa] is in PAST tense form.

- The object of the verb [katsoa] should be in PARTITIVE case.

Minä katsoin kuvan. +PRON-PERS+SG1+NOM+CAP+ [minä]
+V+SG1+TRV+O: PAR+PAST+ [katsoa] +R: katso+V52o
+N+SG+ACC+ [kuva] +R: kuv+N10

Needless to say, that the partitive case is the only alternative in negative sentences (30)

(30)

- The INFLECTION CLASS of the verb [katsoa] is V52o
- The STEM of the verb [katsoa] is {katso}.

- The object of the verb [katsoa] should be in PARTITIVE case.

Minä en katsonut kuvaa. +PRON-PERS+SG1+NOM+CAP+ [minä] +NEG+SG1
+V+TRV+O: PAR+NEG-PAST-SG+ [katsoa] +R: katso+V52o
+N+SG+PAR+ [kuva] +R: kuv+N10

Note that the response did not refer to the negative form of the verb. There was no need for this, because the verb belongs to the group of verbs that always have the partitive object. Finally, we take a look at the imperative form (31).

(31)

- The INFLECTION CLASS of the verb [katsoa] is V52o
- The STEM of the verb [katsoa] is {katso}.
- The verb [katsoa] is in second person singular IMPERATIVE form.

- The object of the verb [katsoa] should be in PARTITIVE case.

Katso kuvaa. +V+SG2+TRV+O: PAR+IMP+CAP+ [katsoa] +R: katso+V52o
+N+SG+PAR+ [kuva] +R: kuv+N10

The response tells that the object should be in partitive form with this verb. Let us see what the response is with a normal transitive verb (32).

(32)

- The INFLECTION CLASS of the verb [maalata] is V73
- The STEM of the verb [maalata] is {maala}.
- The verb [maalata] is in second person singular IMPERATIVE form.

- The object [kuva] should be in NOMINATIVE-ACCUSATIVE or PARTITIVE case, because the verb [maalata] is in imperative form.

Maalaa kuvaa. +V+SG2+TRV+IMP+CAP+ [maalata] +R:maala+V73
+N+SG+PAR+ [kuva] +R:kuv+N10

We see in the examples above that transitive verbs in Finnish can be classified into two groups, each behaving in its own way in structures with an object. The list of Finnish verbs requiring at least preferably an object can be found in Appendix. Part of the verbs are such that also can have an accusative object, whereby its meaning is different.

8 Web browser view

Above I have used the command-line environment for producing the examples. For a learner, however, the environment through a web browser is more convenient. Below I will demonstrate how this functions (33).

(33)

Minä sain luvan ostaa auton. TAG CLEAR

- The INFLECTION CLASS of the verb [saada] is V63
- The STEM of the verb [saada] is {sa}.
- The verb [saada] is in PAST tense form.
- The object of the verb [saada] should be in ACCUSATIVE or PARTITIVE case. NOMINATIVE-ACCUSATIVE case is not allowed.

Minä sain luvan ostaa auton. +PRON-PERS+SG1+NOM+CAP+[minä]
+V+SG1+TRV+PAST+VMOD+[saada]+R:sa+V63 +N+SG+O:ACC-N+N10-E+ACC
+V+TRV+INF+[ostaa]+R:ost+V53 +N+SG+N10" +R:aut" +ACC

The sentence is entered into the left side box, after pressing the tab TAG the output will appear in the right side box.

We enter the same sentence, but with the wrong object case (34).

(34)

Minä sain luvan ostaa auto. TAG CLEAR

- The INFLECTION CLASS of the verb [saada] is V63
- The STEM of the verb [saada] is {sa}.
- The verb [saada] is in PAST tense form.
- The object of the verb [saada] should be in ACCUSATIVE or PARTITIVE case. NOMINATIVE-ACCUSATIVE case is not allowed.

Minä sain luvan ostaa auto. +PRON-PERS+SG1+NOM+CAP+[minä]
+V+SG1+TRV+PAST+VMOD+[saada]+R:sa+V63 +N+SG+O:ACC-N+N10-
E+ACC +V+TRV+INF+[ostaa]+R:ost+V53 +N+SG+N10" +R:aut" +ACC-N

The response is the same as in (33). The learner is reminded about the correct object case regardless the object case entered.

9 Conclusion

In this report I have demonstrated how various sentence structures have effect on the case of the object and subject. The rules are far from simple, and it is often an almost lifelong exercise to learn the use of those cases correctly. In the examples above I have shown what kinds of instructions can be given to the learner. In this implementation, the more basic routines, such as the control of spelling, correct word order, and concordance, were switched off. This was done for reducing the amount of output, because here we wanted to concentrate on object and subject cases.

On the bottom line of each example is all the information that was used for constructing the information comments on the example. First is the typed example sentence. Then follows the analysis of each word. Various tags were joined using the plus sign.

The construction of this kind of interactive learning environment contains a number of such problems that I have not discussed in the report. However, it is possible to construct learning environments for most types of problems.

APPENDIX

halveksua V52	vähäksyä V52-f	harrastaa V53
hieroa V52o	väijyä V52-f	heijastaa V53
hioa V52o	ilkkua V52-A	hidastaa V53
katsoa V52o	aukoa V52o-D	hiillostaa V53
kehua V52	halkoa V52o-D	hiostaa V53
kummaksua V52	huokua V52u-D	hoikistaa V53
kummeksua V52	laukoa V52o-D	juhlistaa V53
lietsoa V52o	taikoa V52o-D	kannustaa V53
meloja V52o	takoa V52o-D	karsastaa V53
neuvoa V52o	velkoa V52o-D	kauhistaa V53
oudoksua V52	lipoa V52o-E	kiinnostaa V53
paapoa V52o	hautoa V52-Fo	koestaa V53
pahaksua V52	huitoa V52-Fo	korostaa V53
paheksua V52	katua V52-F	kuristaa V53
palvoa V52o	kiehtoa V52-Fo	kuvastaa V53
puhkoa V52o	penkoa V52o-G	mainostaa V53
ratkoa V52o	tempoa V52o-H	opastaa V53
torua V52	vartoa V52o-K	painostaa V53
varoa V52o	aristaa V53	patistaa V53
vatvoa V52o	arvostaa V53	puolustaa V53
vieroa V52o	asustaa V53	puristaa V53
viskoa V52o	avustaa V53	rahastaa V53
kysyä V52-f	edustaa V53	rakastaa V53
väheksyä V52-f	ehostaa V53	ravistaa V53

reunustaa V53	kalisuttaa V53-C	narisuttaa V53-C
selostaa V53	kartuttaa V53-C	narskuttaa V53-C
tehostaa V53	kehottaa V53-C	naruttaa V53-C
tiedustaa V53	keikuttaa V53-C	natisuttaa V53-C
tukistaa V53	keinuttaa V53-C	naurattaa V53-C
valistaa V53	kelluttaa V53-C	nolostuttaa V53-C
varjostaa V53	ketjuttaa V53-C	noudattaa V53-C
vastustaa V53	kiduttaa V53-C	odottaa V53-C
voimistaa V53	kiehuttaa V53-C	odotuttaa V53-C
ajatteluttaa V53-C	kieputtaa V53-C	passauttaa V53-C
ajeluttaa V53-C	kihnuttaa V53-C	paukuttaa V53-C
arveluttaa V53-C	kiihottaa V53-C	petkuttaa V53-C
arvottaa V53-C	kiikuttaa V53-C	pimputtaa V53-C
haavoittaa V53-C	koettaa V53-C	pompottaa V53-C
hankaloittaa V53-C	kohahduttaa V53-C	purskuttaa V53-C
harjoittaa V53-C	kolauttaa V53-C	pursottaa V53-C
harjoituttaa V53-C	kolisuttaa V53-C	rapsuttaa V53-C
hassuttaa V53-C	kolkuttaa V53-C	rasittaa V53-C
haurastuttaa V53-C	kopisuttaa V53-C	raskauttaa V53-C
hauskuttaa V53-C	koputtaa V53-C	retuuttaa V53-C
hauskuuttaa V53-C	koskettaa V53-C	riemastuttaa V53-C
hehkuttaa V53-C	kumisuttaa V53-C	riepottaa V53-C
heilauttaa V53-C	kunnioittaa V53-C	rikastuttaa V53-C
heiluttaa V53-C	kuopsuttaa V53-C	ripottaa V53-C
helpottaa V53-C	kuoputtaa V53-C	riuduttaa V53-C
hermostuttaa V53-C	kuormittaa V53-C	roikottaa V53-C
heruttaa V53-C	kurittaa V53-C	roiskuttaa V53-C
hetkauttaa V53-C	kusettaa V53-C	ropisuttaa V53-C
hidastuttaa V53-C	kutittaa V53-C	ruiskuttaa V53-C
hoputtaa V53-C	laskuttaa V53-C	sakottaa V53-C
horjuttaa V53-C	laulattaa V53-C	simputtaa V53-C
huiputtaa V53-C	leijuttaa V53-C	soittaa V53-C
huojuttaa V53-C	lepuuttaa V53-C	solakoittaa V53-C
huolestuttaa V53-C	liehuttaa V53-C	sujuvoittaa V53-C
huudattaa V53-C	liekuttaa V53-C	sulostuttaa V53-C
huvittaa V53-C	liikuttaa V53-C	sumuttaa V53-C
ihastuttaa V53-C	lohduttaa V53-C	surettaa V53-C
ilahduttaa V53-C	loiskuttaa V53-C	tanssittaa V53-C
ilostuttaa V53-C	lorottaa V53-C	taputtaa V53-C
innoittaa V53-C	luistattaa V53-C	tarkoittaa V53-C
innostuttaa V53-C	luisuttaa V53-C	tirskuttaa V53-C
jarruttaa V53-C	luotottaa V53-C	toljottaa V53-C
jouduttaa V53-C	muiluttaa V53-C	tuijottaa V53-C
juoksuttaa V53-C	muistuttaa V53-C	tulittaa V53-C
jututtaa V53-C	murehduttaa V53-C	tupruttaa V53-C
kahisuttaa V53-C	mussuttaa V53-C	turhauttaa V53-C

tuskaannuttaa V53-C	nuuskia V61	opponoida V62
tuskastuttaa V53-C	paiskia V61	parodioida V62
tutisuttaa V53-C	pusia V61	partioida V62
ulkoiluttaa V53-C	roimia V61	peukaloida V62
uuvuttaa V53-C	sohia V61	puida V62
vahingoittaa V53-C	sorsia V61	puntaroida V62
vaikeuttaa V53-C	suomia V61	puoskaroida V62
valottaa V53-C	suosia V61	sabotoida V62
vapisuttaa V53-C	sureksia V61	simuloida V62
varoittaa V53-C	tuumia V61	spekuloida V62
vauhdittaa V53-C	uneksia V61	sponsoroida V62
vaurioittaa V53-C	vaalia V61	symbolisoida V62
vavahduttaa V53-C	vaania V61	symboloida V62
vavisuttaa V53-C	nokkia V61-A	sympatisoida V62
veisauttaa V53-C	ronkkia V61-A	terapoida V62
veisuuttaa V53-C	sorkkia V61-A	terrorisoida V62
veloittaa V53-C	urkkia V61-A	tohtoroida V62
verottaa V53-C	tuuppia V61-B	tyrannisoida V62
vilvoittaa V53-C	moittia V61-C	tyrannoida V62
vimmastuttaa V53-C	nauttia V61-C	vartioida V62
vinguttaa V53-C	raapia V61-E	kolhaista V66
viuhuttaa V53-C	ruopia V61-E	kouraista V66
kavahtaa V53-F	kadehtia V61-F	mulkaista V66
sortaa V53-K	pohtia V61-F	nokkaista V66
puoltaa V54-I	vaatia V61-F	nuolaista V66
ojentaa V54-J	vahtia V61-F	nuuhkaista V66
paimentaa V54-J	agitoida V62	nuuskaista V66
jatkaa V56	apinoida V62	puraista V66
karttaa V56-C	argumentoida V62	raapaista V66
kaihtaa V56-F	dominoida V62	rohkaista V66
kaitsea V58	hallinnoida V62	rouhaista V66
tukea V58-D	havainnoida V62	sipaista V66
funtsia V61	ihannoida V62	sohaista V66
haaveksia V61	illustroida V62	vilkaista V66
halia V61	imitoida V62	rangaista V66-G
halveksia V61	indikoida V62	aavistella V67
hutkia V61	informoida V62	ahdistella V67
kosia V61	jumaloida V62	ajella V67
kouria V61	kiikaroida V62	ammuskella V67
kummeksia V61	kommentoida V62	ampuilla V67
lueksia V61	kontrolloida V62	anella V67
matkia V61	kopeloida V62	anniskella V67
muksia V61	kritikoida V62	annostella V67
nuoleksia V61	kritisoida V62	arastella V67
nussia V61	moukaroida V62	aristella V67
nuuhkia V61	operoida V62	arkailla V67

armastella V67	kuulustella V67	pokkailla V67
arvailta V67	kuvailla V67	povailta V67
arvella V67	kuvastella V67	purra V67r
arvostella V67	lainailla V67	pussailla V67
ennustella V67	laskeskella V67	rakastella V67
haeskella V67	laulella V67	rapistella V67
haikailta V67	lauleskella V67	rassailta V67
haistella V67	lobbailta V67	ravistella V67
hakkailta V67	loruilla V67	repostella V67
halailta V67	lueskella V67	riiailla V67
hamuilla V67	luotsailla V67	riiustella V67
hapuilla V67	lupailla V67	rosvoilla V67
harrastella V67	maalailta V67	rukoilla V67
haukuskella V67	maistella V67	rustailla V67
heijastella V67	maksella V67	ruuvailla V67
heilastella V67	muistella V67	salailta V67
hieruskella V67	mukailla V67	selailta V67
hoivailta V67	mulkoilla V67	seurailla V67
ihailta V67	muodostella V67	sihtailta V67
ihastella V67	mutristella V67	solmeilla V67
kaavailla V67	mutustella V67	sompailta V67
kaipailla V67	napostella V67	sormeilla V67
kaivella V67	nappailla V67	sorvailla V67
kalastella V67	natustella V67	suojella V67
kalistella V67	naukkailla V67	surra V67r
kallistella V67	nautiskella V67	tallailta V67
kangastella V67	nostella V67	tankkailla V67
kanniskella V67	nuoleskella V67	tapailla V67
kasailta V67	ohjailta V67	tarjoilla V67
katsella V67	oikoilla V67	tarkastella V67
kauhistella V67	opiskella V67	tarkkailla V67
kaunistella V67	orjailta V67	tavailla V67
kaupustella V67	ostella V67	tehtailta V67
kehuskella V67	oudostella V67	tiedustella V67
kertoilla V67	ounastella V67	tienailta V67
kirjailta V67	paikkailla V67	tiirailta V67
kokeilla V67	painella V67	todistella V67
kokkailla V67	paiskella V67	toistella V67
kokoilla V67	pakoilla V67	tuhlailla V67
korjailta V67	palvella V67	tunnustella V67
kosiskella V67	patistella V67	tutkailla V67
kovistella V67	peilailla V67	tutkiskella V67
kummastella V67	perustella V67	tutkistella V67
kurkkailla V67	piirustella V67	tuumailta V67
kuskailla V67	pohdiskella V67	tuumiskella V67
kuulostella V67	poimiskella V67	uhkailla V67

uumoilla V67
vakoilla V67
valmistella V67
varastella V67
varistella V67
varmistella V67
varustella V67
vastustella V67
veikkailla V67
vertailla V67
vilkuilla V67
vippailla V67
vuoleskella V67
vuolla V67
nakella V67-A
ajatella V67-C
aloitella V67-C
autella V67-C
harmitella V67-C
havitella V67-C
heilautella V67-C
heilutella V67-C
hemmotella V67-C
herroitella V67-C
kaasutella V67-C
kalkutella V67-C
kannatella V67-C
kartella V67-C
kaupitella V67-C
kehotella V67-C
keikutella V67-C
keinotella V67-C
keinutella V67-C
kieputella V67-C
kihnutella V67-C
kiikutella V67-C
kirjoitella V67-C
kiusoitella V67-C
koetella V67-C
kohautella V67-C
kolkutella V67-C
kopautella V67-C
koputella V67-C
kosketella V67-C
kuivatella V67-C
kulautella V67-C

kuljetella V67-C
kurkotella V67-C
kurotella V67-C
kutitella V67-C
kutkutella V67-C
liehutella V67-C
liekutella V67-C
liikutella V67-C
liioitella V67-C
liotella V67-C
lirautella V67-C
livautella V67-C
lohdutella V67-C
loiskutella V67-C
lopetella V67-C
louskutella V67-C
luetella V67-C
maanitella V67-C
mairitella V67-C
muistutella V67-C
muutella V67-C
naksautella V67-C
naksutella V67-C
nakutella V67-C
napsautella V67-C
napsutella V67-C
naputella V67-C
nirskutella V67-C
notkutella V67-C
noudatella V67-C
odotella V67-C
ohitella V67-C
onnitella V67-C
osoitella V67-C
paisutella V67-C
pallotella V67-C
panetella V67-C
paukautella V67-C
paukutella V67-C
pelotella V67-C
piilotella V67-C
poltella V67-C
pommitella V67-C
pudotella V67-C
puhutella V67-C
purskutella V67-C

raaputella V67-C
raotella V67-C
rapsutella V67-C
rauhoitella V67-C
riepotella V67-C
rimputella V67-C
ripotella V67-C
roikotella V67-C
roiskautella V67-C
roiskutella V67-C
ropsautella V67-C
rouskutella V67-C
rouvitella V67-C
ruiskautella V67-C
saatella V67-C
seisautella V67-C
sekoitella V67-C
silotella V67-C
sinkautella V67-C
sinutella V67-C
sirotella V67-C
soinnutella V67-C
sovitella V67-C
sujautella V67-C
sulatella V67-C
suoritella V67-C
suositella V67-C
suostutella V67-C
surkutella V67-C
talutella V67-C
tanssitella V67-C
taputella V67-C
tavoitella V67-C
tiputella V67-C
toimitella V67-C
toppuutella V67-C
totella V67-C
tuijotella V67-C
tuprutella V67-C
tuskitella V67-C
uhitella V67-C
uitella V67-C
varoitella V67-C
vokotella V67-C
jaella V67-D
kaadella V67-F

kaihdella V67-F	rienata V73	kipristää V53-f
kohdella V67-F	riiata V73	nipistää V53-f
ladella V67-F	riivata V73	nitistää V53-f
suudella V67-F	satsata V73	piristää V53-f
vaihdella V67-F	selata V73	päivystää V53-f
annella V67-J	seurata V73	päristää V53-f
kannella V67-J	siteerata V73	säestää V53-f
kohennella V67-J	soimata V73	viivästä V53-f
komennella V67-J	solvata V73	virkestää V53-f
kuunnella V67-J	sponssata V73	väistää V53-f
muunnella V67-J	stressata V73	väristää V53-f
ojennella V67-J	tuumata V73	äänestää V53-f
parannella V67-J	uhmata V73	helisyttää V53-C-f
rakennella V67-J	vaivata V73	helskyttää V53-C-f
runnella V67-J	veivata V73	hyppyttää V53-C-f
suurennella V67-J	vihata V73	hyppäyttää V53-C-f
imarrella V67-K	hakata V73-A	hyssyttää V53-C-f
kaarrella V67-K	jankata V73-A	hyvittää V53-C-f
liehakoida V68	loukata V73-A	hyödyttää V53-C-f
pokkuroida V68	moikata V73-A	hämmennyttää V53-C-f
harkita V69	rukata V73-A	hämmästyttää V53-C-f
himoita V69	tarkata V73-A	hämäännyttää V53-C-f
isota V72	tulkata V73-A	hätkähdyttää V53-C-f
funtsata V73	veikata V73-A	hölskyttää V53-C-f
halata V73	jelpata V73-B	höykyttää V53-C-f
halveerata V73	haitata V73-C	ihmetyttää V53-C-f
hamstrata V73	motata V73-C	ikävytyttää V53-C-f
heijata V73	tentata V73-C	iljettää V53-C-f
herjata V73	ventata V73-C	irvistyttää V53-C-f
hoivata V73	uhata V73-D	jyrisyttää V53-C-f
huijata V73	huovata V73-E	jyskyttää V53-C-f
ivata V73	kaivata V73-E	jytyttää V53-C-f
jeesata V73	jahdata V73-F	järisyttää V53-C-f
juksata V73	vahdata V73-F	kestittää V53-C-f
kiusata V73	hangata V73-G	kiittää V53-C-f
mollata V73	tingata V73-G	kilisyttää V53-C-f
narrata V73	kinuta V74	kirittää V53-C-f
paijata V73	tahkota V74	kyllästyttää V53-C-f
parjata V73	vainota V74	kylläännyttää V53-C-f
peesata V73	hamuta V75	kärttää V53-C-f
petrata V73	väheksyä V52-f	käryttää V53-C-f
piinata V73	vähäksyä V52-f	käskettää V53-C-f
plarata V73	väijyä V52-f	käskyttää V53-C-f
puijata V73	kärkkyä V52-A-f	kävelyttää V53-C-f
pussata V73	edistää V53-f	käyttää V53-C-f
rassata V73	kilistää V53-f	hyväksikäyttää V53-C-f

leikittää V53-C-f
leyhyttää V53-C-f
leyhättää V53-C-f
liennyttää V53-C-f
lievittää V53-C-f
läimäyttää V53-C-f
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