

Transcription Guidelines of Handwritten Content

Version 1.0 Jun 2023

Manual for transcribing learner manuscripts for the use of handwriting recognition and text analysis

Data Source:

For the transcription and examples within these guidelines, the content of “Textkorpus Scriptoria” of the research database “FD-LEX” by Michael Becker-Mrotzek and Joachim Grabowski of the University of Cologne is used¹.

Note: Protection of Anonymity!

To ensure the confidentiality of the writers, anonymization is required. Names are already blanked out in the images by FD-LEX. However, if names appear in the images, they must be replaced with # to ensure anonymity!

Acknowledgements:

This work was conducted at CATALPA - Center of Advanced Technology for Assisted Learning and Predictive Analytics' of the FernUniversität in Hagen, Germany.

We would like to express our sincere gratitude to the annotators who dedicated their time and expertise to transcribing the challenging handwritten documents used in this study. Their contributions were essential to the success of this project. We would also like to thank them for their valuable feedback, suggestions, and work to continually improve the transcription guidelines throughout the course of this study.

We would like to extend our heartfelt appreciation to Sandra Tietjens and the FD-LEX team for generously providing us with the dataset and for their invaluable support and communication throughout our research process.

¹ Becker-Mrotzek, Michael/Grabowski, Joachim (2018). Textkorpus Scriptoria. In: Michael Becker-Mrotzek und Joachim Grabowski (Hrsg.). FD-LEX (Forschungsdatenbank Lernertexte). Köln: Mercator-Institut für Sprachförderung und Deutsch als Zweitsprache. Verfügbar unter: <https://fd-lex.uni-koeln.de>. DOI: 10.18716/FD-LEX/861.



References:

These Guidelines were introduced at:

Preserving the Authenticity of Handwritten Learner Language: Annotation Guidelines for Creating Transcripts Retaining Orthographic Features

Gold, Christian and Laarmann-Quante, Ronja and Zesch, Torsten in Proceedings of the 1st Computation and Written Language (CAWL) Workshop at ACL, 2023

Applied Use-Case:

Recognizing Learner Handwriting Retaining Orthographic Errors for Enabling Fine-Grained Error Feedback

Gold, Christian and Laarmann-Quante, Ronja and Zesch, Torsten in Proceedings of Innovative Use of NLP for Building Educational Applications (BEA) Workshop at ACL, 2023



1 Target Hypotheses

The transcribed text must correspond to what the learner wrote. The spelling mistakes may not be corrected. In case of doubt, the following must be brought together: What did the learner write or want to write and what will a machine transcription read?

1.1 Format of the transcript

The transcript can be written in MS Excel for simplicity. However, the autocorrection must be switched off, as unintended corrections might be made! The structure of the Excel file should look like this:

#	image name	line number	status	transcript	comment
	Originaltext-IGS-9_2-027.png	1	ok	am 19.11.15 (15:46 uhr)	wurde über die eigentliche erste Zeile g
	Originaltext-IGS-9_2-027.png	2	dis	Der Fah(r)rad fahrer hat die Stra(B)e von Rechts nach	grenzwertige Abstände zw. Fahrrad und
	Originaltext-IGS-9_2-027.png	3	ok	Lin(k)s über queren wollen.	
	Originaltext-IGS-9_2-027.png	4	dis	aus der Sicht des Fahrrad fahres (n)ärte sich ein	Abstand (s. Kommentar oben)
	Originaltext-IGS-9_2-027.png	5	dis	Aut{o} von (l)inks auf der rechten fahr(b)a(h)n.	I oder L?
	Originaltext-IGS-9_2-027.png	6	err	###	
	Originaltext-IGS-9_2-027.png	7	dis	d(o)cjh der Fahr(r)adfahrer ist tr(o)zdem los	Abstand (s. Kommentar oben)
	Originaltext-IGS-9_2-027.png	8	ok	geg(a)ngen, doch der fahrer im {R}oten a(u)t{o} ### {w}ar erschr{o}ken weil	
	Originaltext-IGS-9_2-027.png	9	dis	{d}er fahrr(a)d fahrer i(n+m) den {W}eg a(b)geschritten h(a)t	im/in/ih?
	Originaltext-IGS-9_2-027.png	10	ok	b(e)im versuch dem Fahrrad(f)ahrer (a) zu w(e)ichen	
	Originaltext-IGS-9_2-027.png	11	ok	h(a)t der fahre(r) im Rot(e)n aut{o} ein entgegen	
	Originaltext-IGS-9_2-027.png	12	ok	k(o)mmandes bla(u)jes a(u)t{o} Fr(o)ntal geramt.	Buchstabe o sieht jeweils aus wie a
	Originaltext-IGS-9_2-028.png	1	ok	Ich (finde der Rla(d fahrer ist (schuld	

Four of the five Columns must be filled out each line, containing the *image name* of the transcription document, the current *line number*, the *status* and the *transcript* of the line. An additional *comment* column follows last.

The *status* column can be filled out with *ok*, *err* or *dis*.

The status '*dis*' should be set if the decision remains in doubt and the text should be revised by a second annotator.

The *err*-or status must be set when the selected line should be excluded from the transcription. This can be the case when only crossed-out words are present in the line or an illustration was drawn.

A whole page can be excluded from the transcription in special cases, but this should be discussed on a case-by-case basis with the supervisor.

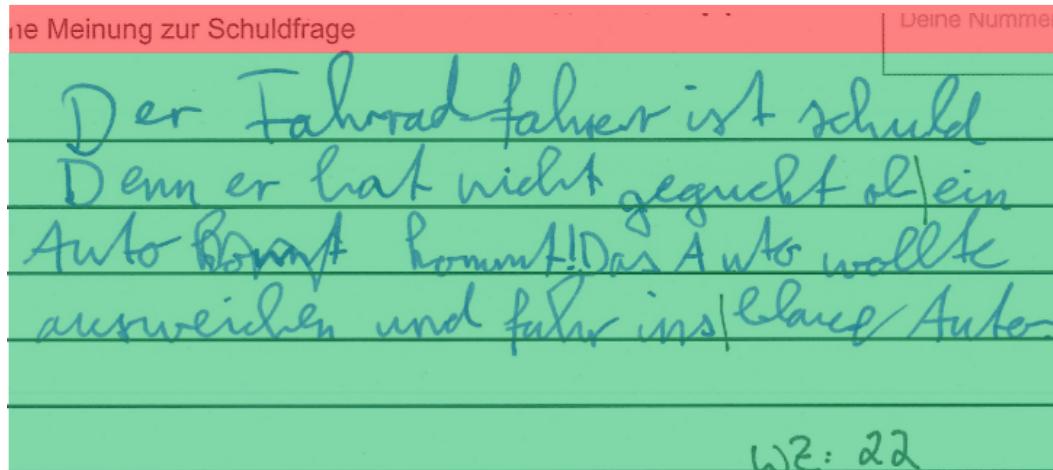
Note: Final Sanity Check

A sanity check is mandatory. When the page has been fully transcribed, the transcription should be read once again completely, so that own errors can be eliminated. Furthermore, the number of text lines in the image must match the highest *line number* in the transcript.



1.2 General Rules

The goal is to convert the content of a learner into a transcript. Therefore, information below the target content must be ignored.



Transcription Rules:

To emphasize non-normative elements (e.g. unclear letters, special features, hyphens, inserts) must be transcribed in curly brackets {}. In the case of special features, an additional character is added into the brackets. An overview list of characters for the transcription follows:

1. Permitted Quotation Marks are: , ‘ ’ “ ”
 2. Lines, whose content should not be transcribed (e.g. crossed out lines), are given the status “error”.
 3. Tally Marks are transcribed with an &: {/&}, {&}, {&}
 4. Spacing {m }
 5. Uncertainties {m}einung
 6. Overlay {M+m}
- Letters were written on top of each other. The first letter marks the correct letter and the second letter marks the letter that is also readable. It can also be more than just one readable letter.
7. Insert {insert1} {insert1 Meinung}
- If the content is at a different position, {insert1} must be written at the place, where the insert should be placed and {insert1 Meinung} at the position, where the insert is located. The inserts need to be counted. If a character like a plus + or asterisk * was used, it must be added to the content. If there are only a few characters above the insert, than without it.
8. Separator {-}
- If one word should be separated into two.
9. Emojis {😊}
- Regardless of the large variety of emojis, only this one is mentioned.
10. Mirror {M}einung and Invention {M+}einung
 11. Swap {swap1.2 Meinungen} {swap1.1 viele}
- “viele Meinungen” instead of “Meinungen viele”



Usages of Tally Marks:

1. Mirrored {M|}
2. Separator {|}

Note: Further Examples

The following examples focus on the previously explained aspects in more detail. If the reader notices further notable aspects within an example, it should not be considered a mistake in the guidelines or overrule other aspects. These were intentionally not additionally addressed, as this could distract from the actual context. Other rules will not be obsolete in the transcript.



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2 Detailed Rules

2.1 Layout

2.1.1 Overlay with layout of sheet

Problem:

A content line was written over text of the sheet.

Handling:

If the handwritten text is overlayed with text of the sheet, it should be transcribed but flagged with an “err”.

Example:

	Universität zu Köln, Mercator-Institut für Sprachförderung un	
	status:	content:
correct:	err	{*} hatte einen Pferdeschwanz

2.1.2 Empty line

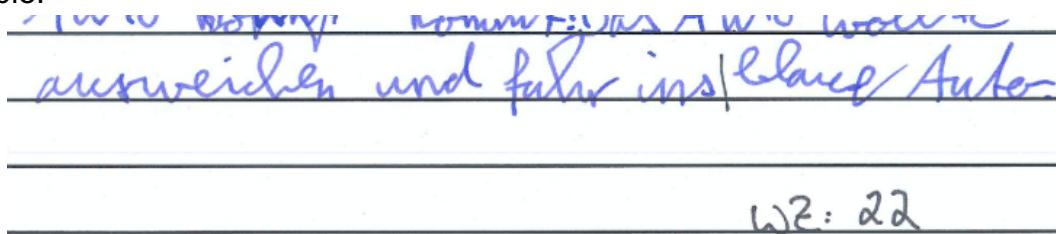
Problem:

An empty line is present, and something was written by another author (e.g. teacher).

Handling:

The content is transcribed but the err status is set. Although we want to focus on the learner content only, those elements are considered for complete transcript as well.

Example:



ausweichen und fahr ins blaue Auto.

WZ: 22

	status:	content:
correct:	ok	[...] blaue Auto.
	err	WZ: 22



2.1.3 Change of pen-color

Problem:

The color of the pen changes within a paragraph.

Handling:

In each text-line it must be decided which pen is most dominate (most words). The words written with the other pen must be placed within curly brackets ({}).

Example:

Am 21.11.2014, um 13:45 Uhr, ereignete

correct: Am 21.11.2014, um 13:45 Uhr, {ereignete}

2.1.4 Text spreading over several lines

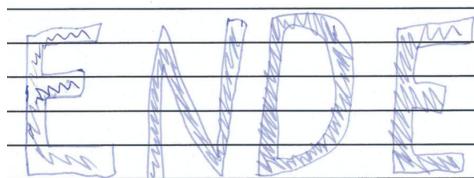
Problem:

A short text that would have fit in a single line was written over several lines.

Handling:

The content will still be written in one line.

Example:



	status:	content:
correct:	err	Ende
incorrect:	err	Ende
	err	Ende

2.1.5 Invalidation of lines

Problem:

A whole line of the text is indicated to be invalid.

Handling:

The line needs to be tagged with an 'err' in the status and for the content three hashtags (###) have to be set.

Example:

~~Ich gehe bei der Kind schule.~~
~~weil der R~~ Der Fahrer des Roten

	status:	content:
correct:	err	###
	ok	#### #### ## Der Fahrer des Roten

2.1.6 Underlines

Problem:

Words were underlined to add emphasis to them.

Handling:

Generally, the underlines are ignored.

Example:

Einbruch genau gesehen.

correct:	Einbruch genau gesehen.
----------	-------------------------

2.2 Punctuation Marks

2.2.1 Quotation Marks

To reduce overhead, only these quotation marks are permitted: , ‘ „ “ . These must be written into the transcript in the same way as they were by the writer. Attention should be paid to the quotation marks' position, and direction (/, |, \).

2.2.2 Regular and special characters

Regular punctuation marks and special characters must be transcribed the way they were written by the learner.

Problem:

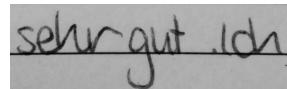
Punctuation marks and spacing are not placed according to the norm.

Handling:

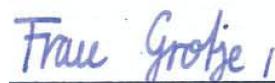
Punctuation marks such as the full stop (.), comma (,) and exclamation mark (!) should be positioned, if the learner has placed them, the way they follow the grammar rules.

Examples:

correct:
incorrect:



sehr gut. Ich
sehr gut .Ich



Frau Grotje,
FrauGrotje,

correct:


laut § 31!

um den
... {→}

2.2.3 Tally Marks

Problem:

To count the number of words in the text, tally marks were placed in the text.

Handling:

The character should be taken over and placed in curly brackets. The direction of the stroke is important, thus allowed characters are: /, |, \. The tally mark should be followed by an ampersand: {&}.



Example:

correct:

ganz \& normal.

ganz {\&} normal.



2.3 Spacing

2.3.1 Spacing between letters

Problem:

The spaces between two letters are too big and it appears as a split of a word.

Handling:

The spacing must be marked separately if it creates a string of letters but that does not create a word. Especially for cases where a pattern of the writer becomes evident. That might be the case when the writer cannot connect capital letters to the rest of the word. The transcript should be written using curly braces, the disconnected letter, and a space, e.g. {A }. But if the distance between two letters divides one word into two independent words, the distance must be entered as usual with a space.

Examples:

!Das Äuto

correct:
incorrect:

! Das {A }uto
!Das A uto; ! Das A uto; ! Das Auto

Er gin g mit

correct:
incorrect:

Er gin{ g} mit
Er gin g mit

eine S traße

correct:
incorrect:

eine {S }traße
eine S traße

2.3.2 Spacing between words

Problem:

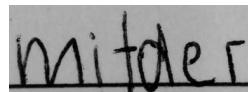
The spacing between words or punctuation marks to words is too small or too big. It seems there is no spacing, or a word usually written together appears as two separate words. Seldom, a separation was indicated with the help of a separator.

Handling:

Spaces are added if it is recognizable that the writer wrote the words separately or intended to write them separately. Words that are spelled but do not belong together are considered spelling errors and should be written the way the writer wrote them. Words that belong but were not written together must be separated by a space. This is especially the case when the second word begins with a capital letter. If a separator was used it must be marked within curly brackets.

Examples:

2.3.2a) Small distance between words

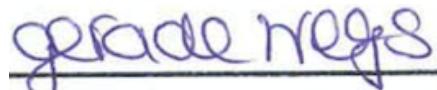


- correct: mitder
 incorrect: mit der

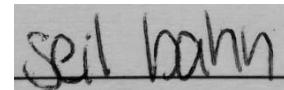


- in der Hand
 inder Hand

2.3.2b) Big distance within a word



- correct: gerade wegs
 incorrect: geradewegs

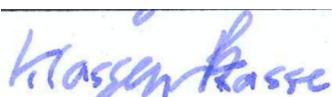


- seil bahn
 seilbahn



- correct: war über deckt.
 incorrect: war überdeckt.

2.3.2c) Connection

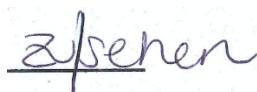


- correct: Klassen{k}asse; Klassen{k+K}asse
 incorrect: Klassen kasse

2.3.2d) Separation



- correct: auf {-} die
 incorrect: aufdie



- zu {-} sehen
 zu|sehen



2.4 Spelling Errors and unclear situations

2.4.1 Spelling Errors

Problem:

A spelling error was written.

Handling:

Spelling errors must be transferred as they are written.

Examples:

Das Rote Auto

correct:	Das Rote Auto
incorrect:	Das rote Auto

kammen

kammen
ka{m}en

2.4.2 Unclear situations

Problem:

It's hard to tell if a letter is spelled uncommonly, incompletely, or with a spelling error.

Handling:

Spelling errors must be transferred as they are written. Always assume the correct letter unless there is clear evidence for a wrong letter.

If a letter is unclear or not readable, it must be decided within the context: which word the learner wanted to write and which letter it should be in terms of spelling. The letter must be emphasized by adding curly brackets.

Examples:

2.4.2a) Unclear

ausweichen Bläue Achtfte

correct:	ausw{e}ichen	Bl{a}ue
incorrect:	auswachen; ausweichen	Bloue

A{c}htete
Aehtete

2.4.2b) Missing or additional element of a Character

fuh

clé

correct:	fuh{r}	{d}e
incorrect:	fulr; fulv	{d}ie; d{i}e; de

wollle

- correct: woll{t}e
 incorrect: wollle; wollte

Faschenlampe

- {T}aschenlampe
 Faschenlampe, Taschenlampe

2.4.2c) Possibility of various interpretations

hinein

- correct: {h}inein
 incorrect: lunein

schnell

- schnell{e}
 schnelll; schnelle

2.4.2d) Unusual scaling

denke

- correct: den{k}e
 incorrect: den{K}e; denke

überqueren

- über{q}ueren
 überQueren; überqueren

meiner Meinung

- correct: meiner {m}einung
 incorrect: meiner meinung; meiner Meinung

nach

- nac{h}
 nacn

Moment

- correct: {M}oment
 incorrect: Moment; {m}oment

Kann

- {k}ann
 Kann; kann

2.4.2e) Overlay of characters

wenn

- correct: wenn
 incorrect: {w}{e}nn

mehere

- correct: me{h}{r}ere; me{h}{r}{e}re
 incorrect: mehere; me{h+r+e}



2.4.3 Intentional overlays

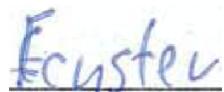
Problem:

Instead of struck-out a letter, it is overwritten and allowing several solutions to be correct.

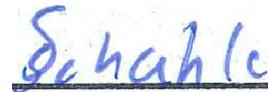
Handling:

All recognizable letters must be written down, starting with the correct letter in terms of spelling inside of curly brackets ({}) followed by a plus sign (+) with the incorrect letter.

Examples:



correct: {F+f}enster
incorrect: fenster



{S+s}chuhle
Schuhle



correct: Au{ß+ss}erdem
incorrect: Außerdem



Spa{ß+ss}
Spa{ss+ß}



2.5 Inserts

2.5.1 Direct inserts

Problem:

Something should be inserted between two words or above a crossed out word. The word or letter that should be inserted was placed directly at the insert position.

Handling:

If the insert is positioned where these letters or few words should be inserted, they must be written within curly brackets added by an arrow symbol (e.g. {<and>}). If a symbol, such as an asterisk, has been placed, it must be inserted too. Furthermore, an arrow symbol (<) must be added to indicate a direct insertion. If many words should be inserted, {insert1} must be placed at the location and the words to be inserted must be transcribed at the end of the text line alike: {insert1 text}.

Examples:

2.5.1a) Insert of a letter

	<u>übr</u> correct: incorrect:	<u>Stäße</u> St{<r>aße übre Straße	<u>her-aus</u> ###{<her->}aus ###her-aus
	<u>scho selber</u> correct: incorrect:	<u>scho#{<n>} selber</u> scho#{<n>} selber scho#n selber	<u>Spielgeräte gekatt</u> Spielgeräte geka#{<uft>} Spielgeräte geka#uft

2.5.1b) Insert of a word

	<u>blauen</u> <u>des Auto</u> correct: incorrect: incorrect:	<u>Der Fahrad-fahrer</u> zusammen Der Fahrad {<zusammen>} – fahrer Der Fahrad-Fahrer; Der Fahrradfahrer
	<u>Verkehrsunfall in der Nähe</u> correct: incorrect:	Verkehrsunfall ### {<in der Nähe>} Verkehrsunfall ### in der Nähe

2.5.1c) Insert of a many words

nun auch bekannt als Michael U.

Verletzten zu helfen.

correct: Verletzten {insert1} zu helfen. {insert1 nun auch bekannt als Michal U.}

incorrect: Verletzten nun auch bekannt als Michael U. zu helfen

2.5.2 Indirect inserts

Problem:

A word, several words, or even sentences should be inserted at a location but where written at the end of a page. This is typically indicated by a character like an asterisk (*) or plus (+). When several indirect inserts were made the sign is usually followed by a number or the signs differ.

Handling:

At the location where the text should be inserted a {insert} must be set, followed by numbering starting with 1 and the used sign of the writer: e.g. {insert1 *}. Additionally, if the writer wrote numbered the signs, the corresponding number must be added at the sign: {insert1 *1}. Likewise, at the place where the content of the insert is written, a curly bracket must be used: {insert1 *1 that's what I wanted to add}.

Examples:

2.5.2a) Inserts

Gestern, stand ich

correct: Gestern, {insert1 *} stand ich

incorrect: Gestern, stand ich

and

* am 11.03.2015 um 12³⁰ Uhr

correct: {insert1 * am 11.03.2015 um 1230 Uhr,}

incorrect: # am 11.03.2015 um 1230 Uhr,

Hand, und eine Taschenlampe. Er ging zu einem
an. Die Frau ~~hat~~ trug ein hellblauer Pullover, und

correct: Hand, {insert1 *} und [...]
[...]
an. [...] Pullover, {insert2 *} und
and

* hatte ein dunkel grüne ~~T~~ ~~shirt~~ Pullover an und
④ hatte einen Pferdeschwanz

correct: {insert1 * hatte ein du{<c>}kel [...] und}
{insert2 * hatte einen Pferdeschwanz}

2.5.2b) Numbered insert

Auto +1 wollte

correct: Auto {insert1 +1} wollte
incorrect: Auto +1 wollte
and

x1 sah ihn und

correct: {insert1 x1 sah ihn und}
incorrect: x1 sah ihn und

2.5.2c) Word in other line

"Mit
freundlichen Grüßen

correct: {insert1 Mit}
{insert1 freundlichen Grüßen}

am, oberarm verletzte
linken

correct: ### am {insert1} oberarm verletzt.
{insert1 linken}

überqueren wollte. Der Fahrer im roten Auto, links
ab um den Fahrradfahrer nicht zu treffen bog

correct: überqueren [...] Auto {insert1} links
ab [...] zu treffen. {insert1} bog

dass ich ihr immer beistehe und sie immer zu mir
wenn sie wirklich meine beste Freundin wär, dann
würde sie mit mir zusammen zum Lehrer gehen und ^{Kommen}
kann.

correct: dass [...] mir {insert1} {insert2}
{insert1} kommen
Wenn [...] dann {insert2} kann.
würde [...] und



2.6 Struckthrough

Problem:

A letter or word was struckthrough.

Handling:

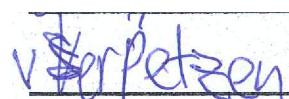
The struckthrough must be identified with a hashtag (#) in accordance to the number of characters which were made invalid. If a correction was placed, it must be inserted either to the left or right of the hashtag.

Examples:

correct:
incorrect:

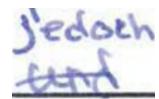


Blu##
Blut



v#erpetzen
v erpetzen

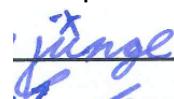
correct:
incorrect:



{<jedoch} ###
{<jedoch}



austo#ben
austopben



j{u}nge
ju#nge

correct:
incorrect:



#



der ##
der #####

correct:



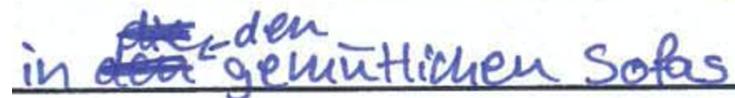
rachförderung und Deutsch als Zweitsprache
von der Zeugin

correct:



also {<##### kein} Veräter

correct:
incorrect:



in ### {<den} gemütlichen Sofas
in ### ### {<den} gemütlichen Sofas



2.7 Word Separation

Problem:

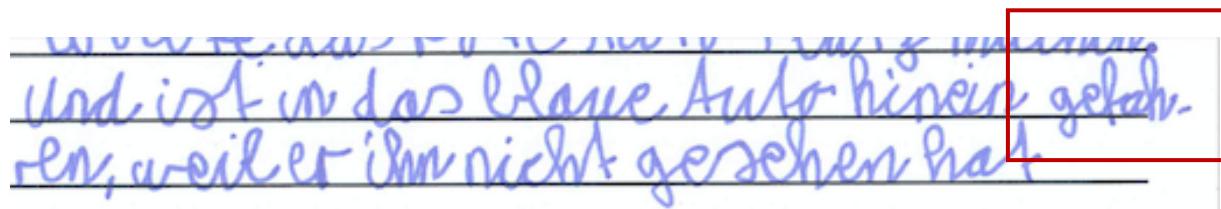
The word separation does not appear syllable by syllable.

Handling:

The transcript must represent what is written. Therefore, the used separation of words must be transcribed.

Example:

It should be noted that no suitable example with incorrect syllable separation was found. However, this example shall indicate how to proceed.



Handwritten German sentence: "Und ist in das blaue Auto hinein gefahren, weil er ihn nicht gesehen hat."

correct: und ist in das blaue Auto hinein gefah-
 ren, weil er ihn nicht gesehen hat

2.8 Date and Time

Problem:

Date and time can be given in various forms.

Handling:

The date and time should be transcribed as the learner wrote them. Underlines are ignored.

Examples:

2.8a) Date

correct: 11.01.2015

M.03.2015

13. November. 2014

13. November. 2014

2.8b) Time

correct: 14:30h

14:30 h

1230 Uhr

1230 Uhr,



2.9 Artifacts

Problem:

Letter artifacts may be present that do not form a valid letter.

Handling:

For the sake of the learner, no letter should be interpreted into the artifact. Instead, a hashtag (#) will be placed.

Examples:

correct:
incorrect:

frei # ist

frei c ist

Fundbüro # und

Fundbüro cund

2.10 Emoticons and Drawings

2.10.1 Smileys

Problem:

Smileys were written in form of horizontal compositions of characters.

Handling:

The used characters must be transcribed as they appear.

Examples:

correct:

:D (-:-)

2.10.2 Emoticons

Problem:

Emoticons are included in the text in form of vertical small drawings.

Handling:

Any type of emoticon should be expressed by the Unicode "U+1F642" within curly brackets and will appear in the transcript as "{😊}".

Examples:

correct:
incorrect:



{😊 }



{😊 }
<3

but

Freund{i}n
Freund{😊 }n

2.10.3 Drawings

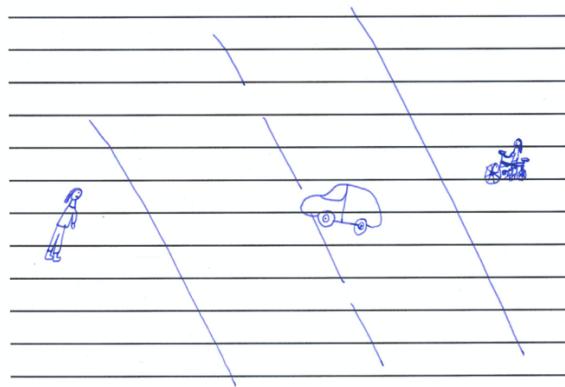
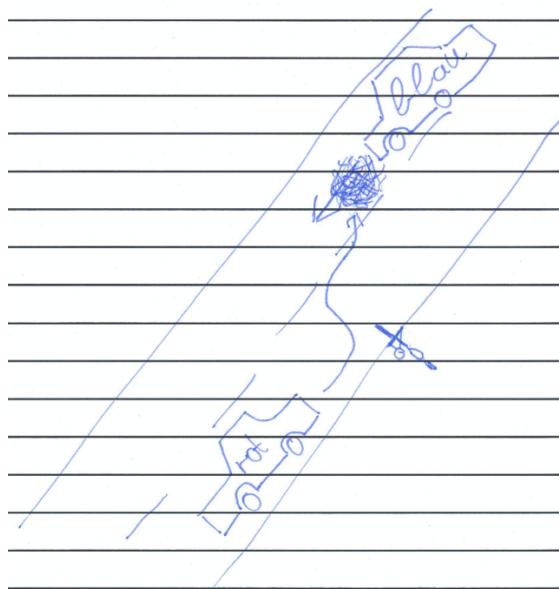
Problem:

Instead of a text, a drawing is found.

Handling:

The lines across the drawing stretches will have the status "err" given. In addition, a comment with a hint must be written in the line where the image appears for the first time. If the picture finishes the written text, only the line must appear in the transcript (including error status and comment)

Examples:





2.11 Mirrors and Inventions of Letters

Problem:

A letter was written mirrored, is "invented" or added by other elements.

Handling:

The mirrored letter must be completed by a tally mark (|). For the Invention and Addition, choose the letter that the writer wanted to write and add a plus sign (+). In both cases, square brackets ({})) must be placed around the transcript.

2.11.1 Mirrors

Examples:

correct:
incorrect:

fahrer aus

fahrer {a|}us
fahrer aus

but

abCPDogen

a{b}ge{b}ogen
a{a|}ge{a|}ogen

2.11.2 Additions and Inventions

Examples:

2.12.2a) Addition of Elements on Letters

correct:
incorrect:

#err

{H+}err
{H}err

2.12.2b) Additions appears as several Letters

beuwiesen

be{w+}iesen
beuwiesen

2.12.2c) Connection of Letters

correct:
incorrect:

gege spur

gege{n+}spur
geg{u+}spur

2.12.2d) no Setting Down of the Pin



Fahrer

correct: {F+}ahrer
incorrect: Fahrer

Fahrseite

{F+}ahrseite
Fahrseite

2.12.2e) uncommon Version of a Letter

eute

correct: {L+}eute
incorrect: {L}eute

Dadurch

{D+}adurch
Dadurch

können

{k+}önnen
können

fest

{f+}est
fest



2.12 Swap of words

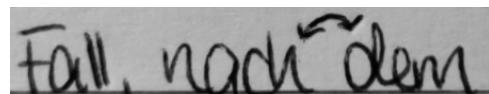
Problem:

Two words should be swapped. This was marked with arrows or a left right arrow (\leftrightarrow).

Handling:

The previous word will be marked as the second word and the following word will be marked as the first word. This will be done with two separate curly brackets starting with the keyword: swap followed by the appearance of swap and the position of the word. For example: {swap1.2 text} and {swap1.1 text}

Example:



correct: Fall, {swap1.2 nach} {swap1.1 dem}

incorrect: Fall, nach dem