Qn.1A, if you used the supplied replay software:
Please save and submit your results using the filename:
'Q1A_ReplayDescribed_YOURINITIALS'

Answer- Please see attachment doc in "JPEG Image" with the filename:
'Q1A_ReplayDescribed_ ID21'

(The above photo is included in the attacked "WinRAR" folder with the name "all_attachments_answers_ ID21")

Please specify (i) the investigation method used to a) examine the video sequence and
b) extract and examine the frame, and (ii) all steps executed. The information you
provide should have sufficient detail so that anyone could independently reproduce your
results.

Answer- Please see attachment doc in "pdf" with the filename:
'q1a_methot1_ReplayDescribed_answer_steps_ ID21'

(The above pdf doc is included in the attacked "WinRAR" folder with the name "all_attachments_answers_ ID21")

~~**Qn.1A, if you used another method:**~~
~~Please save and submit your results using the filename:~~
~~'Q1A_OtherMethod_YOURINITIALS'~~

~~Please specify (i) the investigation method used to a) examine the video sequence and~~
~~b) extract and examine the frame, (ii) all tools used, and (iii) all steps executed. The~~
~~information you provide should have sufficient detail so that anyone could independently~~
~~reproduce your results.~~

~~Use any space you need~~

Qn.1B, if you used the supplied replay software:
Please save and submit your results using the file name:
'Q1B_ReplayDescribed_YOURINITIALS'

Answer- Please see attachment doc in "JPEG Image" with the filename:

'Q1B_ReplayDescribed_ ID21'

(The above photo is included in the attacked "WinRAR" folder with the name "all_attachments_answers_ ID21")

Please specify (i) the investigation method used to a) examine the video sequence and b) extract and examine the frame, and (ii) all steps executed. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

Answer- Please see attachment doc in "pdf" with the filename:
'q1b_methot1_ReplayDescribed_answer_steps_ ID21'

and attachment Text Document with the filename:
'Q1B_ReplayDescribed_ ID21'

(The above docs are included in the attacked "WinRAR" folder with the name "all_attachments_answers_ ID21")

Qn.1B, if you used another method:
Please save and submit your results using the filename 'Q1B_OtherMethod_YOURINITIALS'

Please specify (i) the investigation method used to a) examine the video sequence and b) extract and examine the frame, (ii) all tools used, and (iii) all steps executed. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

Use any space you need

Qn.1C

Frame Size of source file recording used in Qn.1A				Frame Size of source file recording used in Qn.1B			
612	x	732	Pixels (*)	594	x	720	pixels

{(*) Approximately (Near). Because the actual frame has been cropped in order to reject the area includes the players interface}

What are your conclusions about the raw, encoded quality of the provided video frame/sequence in Q1A and Q1B?

From the properties of the 2 frames, the encoded quality seems to be almost the same, although, the first video (Q1A) seems to be more brightest from the second one (Q1B) Also the data of the first photo (Q1A) are 105 KB, and of the second photo (Q1B) are only 36.4 KB

Question 2: Super-Resolution from supplied sequence of 249 .bmp files

Qn.2A
Please select your best result, i.e.: a single best quality super-resolution image:
Please save and submit your results using filename: "Q2A_SuperRes_YOURINITIALS"

Answer- Please see attachment folder with the filename:
'Q2A_SuperRes_ ID21' (relative photos are included)

and attachment "pdf" doc with the same filename:
'Q2A_SuperRes_ ID21'

(The above docs are included in the attacked "WinRAR" folder with the name "all_attachments_answers_ ID21")

1. How have you ingested the material into your enhancement system and super-resolution software tools?
   Please detail all steps of any conversion performed including all software tools and settings used. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

Answer

1	Copy all photos in a folder and name it "1 q2a all pictures raw"
2	With the software "PIXresizer 2.0.8" I resize all pictures simultaneously and saved them in a folder with the name "2 pixresize1"
3	In a new folder named "3 select pict111 crop bw paintnet", I copy-paste the resized image with name "SuperRes0111", (It was one with good optical impression according to my opinion). With the software "paint.net 4.0.3", I cropped the number plate, and I used auto levels, contrast, brightness, invert colours and black and white settings to improve the appearance of the image to make a conclusion of the possible letters or numbers. Simultaneously, I save this cropped image in four versions for better result and comparison (pls see attachment "pdf" doc with the same filename: 'Q2A_SuperRes_ ID21')
4	Finally, with the software "MovieMaker", I created a video, including all resized pictures but I set it to play X16 fast forward in order to achieve better optical impression of the number plate and to have an alternative mean for comparison. This Video I saved it in a folder named "4 movie maker". I played it with the software "VLC media Player", I used different filters of this software, and the result seems to be similar.
5	Possible letters and numbers of the Plate

(K or A), (D or B), 9, I, V, I, F

| 6 | Note: This number plate seems to be the same with the fourth plate (4th) in the next exercise Q2B |
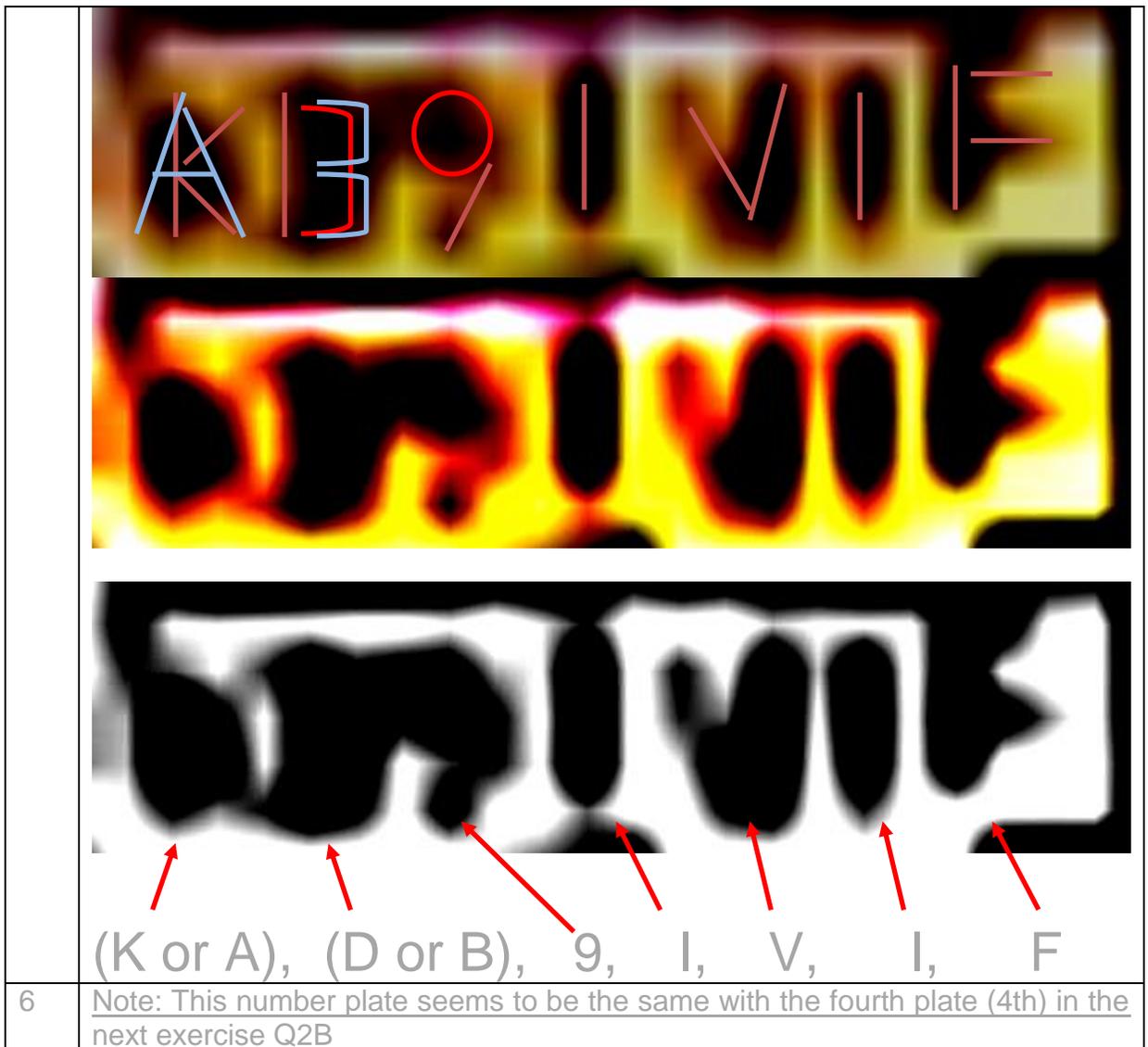
2. Please specify all software tools and all Enhancement Filters used (in order) and specific parameter settings; e.g. Super-Resolution Filter (Method? Zoom factor? Number of Iterations? Interpolation?......)

Answer

(1) **PIXresizer 2.0.8**
I use the tap (Work with multiple files), Select source and destination, select new size – to full (1200X1000 pixels, see followed images), select file format – which the result pictures will become, check the – Enlarge pictures if needed, and save pictures. (All new pictures will be saved in the selected format and in the destination folder). You can do this as many times is needed. I resized the pictures twice.
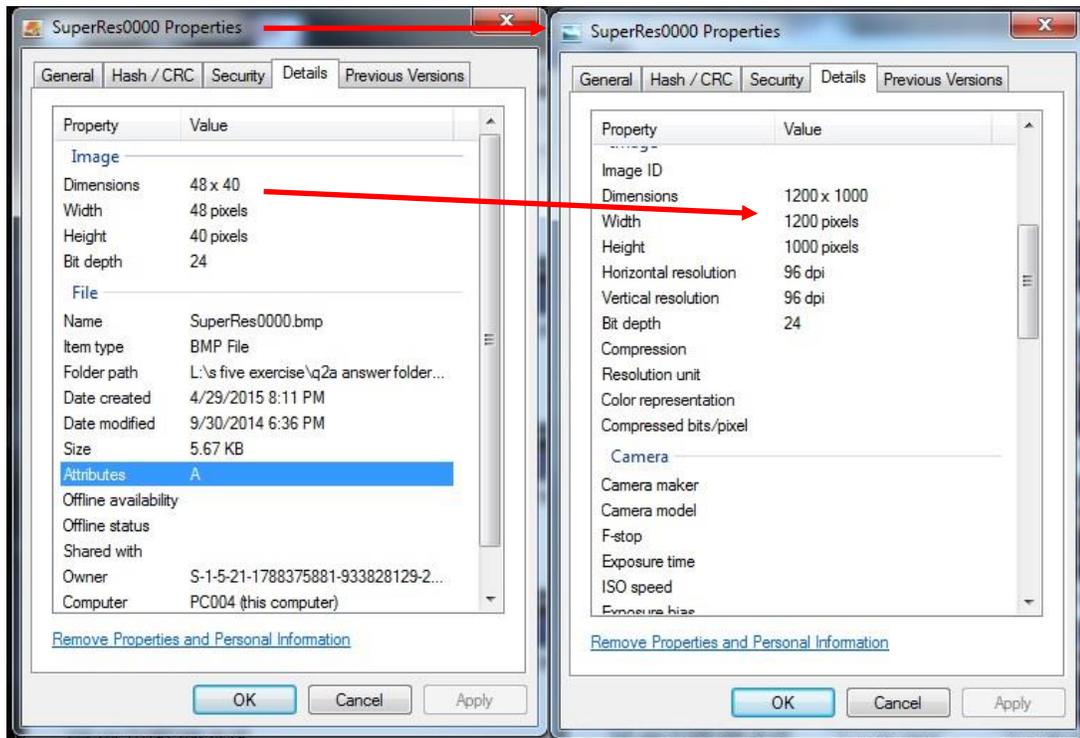
(2) **paint.net 4.0.3**

I used this software to crop only the number plate, and I used auto levels, contrast, brightness, invert colours and black and white settings to improve the appearance of the image to make a conclusion of the possible letters or numbers. Simultaneously, I save this cropped image in four versions for better result comparison
(pls see attachment "pdf" doc with the same filename: 'Q2A_SuperRes_ ID21')

(3) With the software "MovieMaker", I created a video, including all resized pictures from folder with name "3 pixresize2", but I set it to be plaing X16 fast forward. This video I saved it in a folder named "5 movie maker"

(4) I played this video with the software **"VLC media Player"**, I used different effects and filters in tools tap, of this software, and the optical result seams to be similar

3. Did you select a "region of interest" for directing the super-resolution tool? If so please specify co-ordinates of the region (if used) in the format given by the tool.

   No, I just select a specific picture with name "SuperRes0111"

4. Did you select any specific frames or image? If so, please provide details of range of frames or specific frames you used.

   Yes, I just select a specific picture with name "SuperRes0111"

5. Please provide any other information that would be needed so that others would be able to repeat and reproduce your work.

Resizing pictures, giving them more resolution and details, in order to achieve smoother colour edges to the shapes of the numbers and letters. Then use different optical filters to bring out and reviled the numbers and letters.
The main thing with the video is to make an optical illusion and to quickly project all pictures, one after the other. Our eye may recognises a proper result.
All above actually, represent the opposite algorithms of the cause of a problematic picture

Qn.2B
Please select your best result, i.e.: a single best quality super-resolution image:
Please save and submit your results using filename: "Q2B_SuperRes_YOURINITIALS"
Answer, Plate 1 -

1 symbol	2 symbol	3 symbol	4 symbol	5 symbol	6 symbol	7 symbol
P	A	Z	G or 6	Z or 7	I or 1	N

Please see attachment folder with the filename: 'Q2B_SuperRes_ ID21'
(Relative photo is included with file name "Q2B_plate1_ ID21")

Answer, Plate 2 –

1 symbol	2 symbol	3 symbol	4 symbol	5 symbol	6 symbol	7 symbol
A	4	V	S or 6	C or 0	L or E	N or H

Please see attachment folder with the filename: 'Q2B_SuperRes_ ID21'
(Relative photo is included with file name "Q2B_plate2_ ID21")
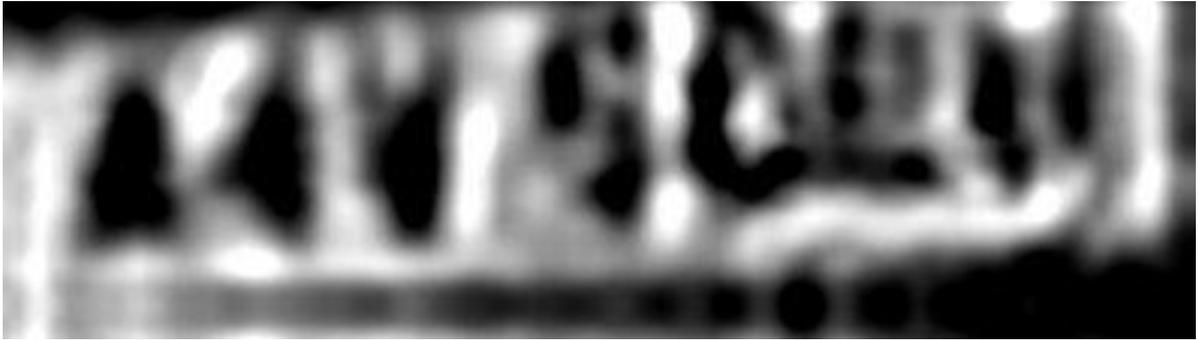
Answer, Plate 3 -   **WDC**L383 ??????
Please see attachment folder with the filename: 'Q2B_SuperRes_ ID21'
(Relative photo is included with file name "Q2B_plate3_ ID21")

Answer, Plate 4 -

1 symbol	2 symbol	3 symbol	4 symbol	5 symbol	6 symbol	7 symbol
K or A or H	B or D	9	I or T or 7 or 1	V or U	I	F

Please see attachment folder with the filename: 'Q2B_SuperRes_ ID21'
(Relative photo is included with file name "Q2B_plate4_ ID21")

Note -: This number plate has very good chances to be the same with the plate of the above exercise Q2A. See picture further.
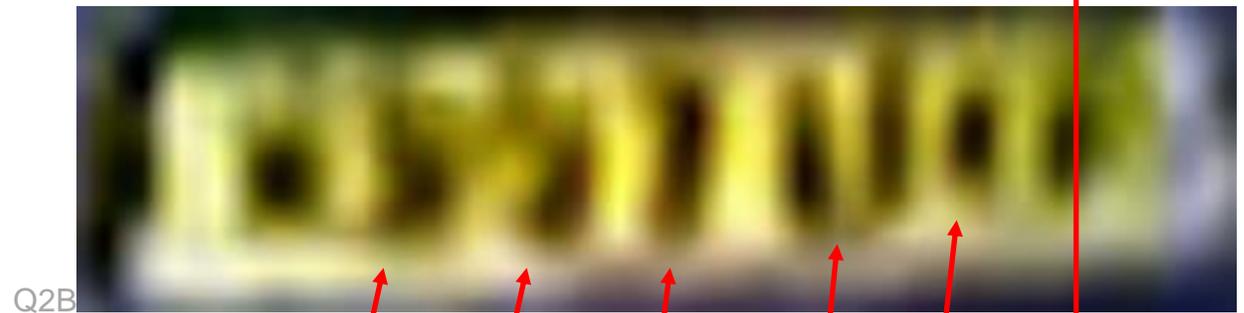
Q2B

Q2B

Q2A

(The above docs are included in the attacked "WinRAR" folder with the name "all_attachments_answers_ ID21")

Answer, Plate 5 -

1 symbol	2 symbol	3 symbol	4 symbol	5 symbol	6 symbol	7 symbol
D (?)	U (?)	M (?)	T	5 or 6 or 8	0	J or 3

Please see attachment folder with the filename: 'Q2B_SuperRes_ ID21'
(Relative photo is included with file name "Q2B_plate5_ ID21")

1. How have you ingested the material into your enhancement system and super-resolution software tools?
   Please detail all steps of any conversion performed including all software tools and settings used. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

Answer

1	Copy the downloaded video in a folder and name it "1 original video dav file"
2	With the software "Prism Video File Converter" I convert it to AVI formad and I save it in a folder which I name it " 2 convert avi Prism Video File Converter" The video details were : Size 483 MB Frame width 352 Frame height 288 25 frames/second
3	I used the software "Video Enhancer" to increase its resolution and I save it in a folder which I name it "3 super resolution Video Enhancer" The video details now are : Size 2.43 GB Frame width 800 Frame height 654 25 frames/second
4	With "VLC media Player" I Played the Video and I selected 25 snap shot photos which visually looked very good to me and served my purpose. For this I concentrated in one plate at the time. Those photos I seved them in a subfolder which I name it "4 VLC snapshots and pixresize/1 vlc snapshots" Dimensions 800X654
5	With the software "PIXresizer 2.0.8" I resize snapshot simultaneously and saved them in another subfolder with the name "4 VLC snapshots and pixresize/2 vlc snapshot pixresize" Dimensions 1200X981
6	I created a new folder named it "5 select crop one by one adjust". In that I created 5 subfolders for each 5 plates. After a good inspectionb of the resized 25 pictures and by playing the video in fast forward several times, I selected one of the best photo for each plate and I save it in the relative subfolder

7	With the software "Paint.NET", I cropped each picture to the plate I interested, resized them again X400%, convert them in Monochrome Black and end white and adjust contrast and brightness in order for better appearance. In every good optical result I saved again the picture in order to have more versions of the result.
8	With the software "ImageJ", I used the tool "Optical Debluring" to Deblure all the plates as much as possible, in order to read the letters and numbers.
	Details about the setting I used on this software on every plate photo it can be seen on every attached photos in the folder with file name "Q2B_plate5_ ID21"
	(About the number plate 3, this software didn't do anything better, so it didn't be used for that one).

2. Which of the 5 number plates have you concentrated your efforts on (1=closest number plate, ..., 5=most distant) and how did you decide on selecting this number plate?

   Selected no. plate:
    Decision reached how:
I worked and consecrated with all plate and tried to reviled the written
The easiest one I believe is the plate 1, because is nearest to the camera
I also consecrated to Plate 4, which it seems to be the same with that in above exercise Q2A and that was a challenge.

3. Please specify all software tools and all enhancement filters used (in order) and specific parameter settings; e.g. Super-Resolution Filter (Method? Zoom factor? Number of Iterations? Interpolation?......)

   All details are included step by step in my above answer Q2B - 1

Software used -:
   (1) Prism Video File Converter (Converting video to AVI)
   (2) Video Enhancer (increase Video resolution)
   (3) VLC media Player (Play the Video, selected snapshots)
   (4) PIXresizer 2.0.8 (resize snapshot simultaneously, Details on how you simultaneously resize multiple pictures are described above on exercise
       Q2A –2–(1))
   (5) Paint.NET (Crop the plates, resize them again, adjust contrast and brightness)
   (6) ImageJ, I used the tool "Optical Debluring" to Deblure all the plates as much as possible.

4. Did you select a "region of interest" for directing the super-resolution tool? If so please specify co-ordinates of the region (if used) in the format given by the tool.

Only selected snapshots from the video, according to the optical impression and the specific plate I was investigating.

5. Did you select any specific frames or image? If so, please provide details of range of frames or specific frames you used.

25 Frames, from them, I used 5 each for every plate, as described above in details.

6. Please provide any other information that would be needed so that others would be able to repeat and reproduce your work.

Convert the video in playable format, increase its resolution, fast-forward play it, select proper pictures, cropped them, resized them again, adjust main optical improvements, and use a tool to deblure them. For assistance play all the time the video in fast forward again and again.

Qn2B. (continued): optional:

As indicated on the Collaborative Exercise webpage you may choose to submit multiple results. If this is the case then please specify how you obtained your results by replicating the previous 6 points for each Procedure/toolset used and/or each possible license plate you focussed on.

For example:

Please save and submit your results using filename:
'Q2B_SuperRes_Procedure1_PlateAll_YOURINITIALS' to indicate the best enhancement result you obtained for all plates using the Procedure1 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

and/or

Please save and submit your results using filename:
File name: 'Q2B_SuperRes_Procedure2_Plate1_YOURINITIALS' to indicate the best enhancement result you obtained for Plate 1 using the Procedure2 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

and/or

Please save and submit your results using filename:

File name: 'Q2B_SuperRes_Procedure2_Plate2_YOURINITIALS' to indicate the best enhancement result you obtained for Plate 2 using the Procedure2 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

etc.

Qn.2C (optional)

Please select your best result, i.e.: a single best quality super-resolution image: please save and submit your results using filename: "Q2C_SuperRes_YOURINITIALS"

1. How have you ingested the material into your enhancement system and super-resolution software tools?
   Please detail all steps of any conversion performed including all software tools and settings used. The information you provide should have sufficient detail so that anyone could independently reproduce your results.

   Use any space you need

2. Which of the 5 number plates have you concentrated your efforts on (1=closest number plate, ..., 5=most distant) and how did you decide on selecting this number plate?

   Selected no. plate: 1, 2, 3, 4, or 5

   Decision reached how:

3. Please specify all software tools and all enhancement filters used (in order) and specific parameter settings; e.g. Super-Resolution Filter (Method? Zoom factor? Number of Iterations? Interpolation?......)

   Use any space you need

   1.
   2.
   3.
   4.
   5.
   Etc

4. Did you select a "region of interest" for directing the super-resolution tool? If so please specify co-ordinates of the region (if used) in the format given by the tool.

Use any space you need

5. Did you select any specific frames or image? If so, please provide details of range of frames or specific frames you used.

Use any space you need

6. Please provide any other information that would be needed so that others would be able to repeat and reproduce your work.

Use any space you need

Qn2C. (continued): optional:

As indicated on the Collaborative Exercise webpage you may choose to submit multiple results. If this is the case then please specify how you obtained your results by replicating the previous 6 points for each Procedure/toolset used and/or each possible license plate you focussed on.

For example:

Please save and submit your results using filename:
'Q2C_SuperRes_Procedure1_PlateAll_YOURINITIALS' to indicate the best enhancement result you obtained for all plates using the Procedure1 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

and/or

Please save and submit your results using filename:
File name: 'Q2C_SuperRes_Procedure2_Plate1_YOURINITIALS' to indicate the best enhancement result you obtained for Plate 1 using the Procedure2 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

and/or

Please save and submit your results using filename:

File name: 'Q2C_SuperRes_Procedure2_Plate2_YOURINITIALS' to indicate the best enhancement result you obtained for Plate 2 using the Procedure2 you will describe using a cut-paste repetition of the 6 previous subquestions above, etc.

etc.

Question 3: Focal deblur test

Please specify (i) <u>all software tools or processing steps</u>, (ii) <u>all enhancement filters</u> used (in order) and (iii) <u>all specific parameter settings.</u> The information you provide should have sufficient detail so that anyone could independently reproduce your results.

125 cm chart:
Please save and submit your results using filename: 'Q3_125cm_YOURINITIALS' or 'Q3_125cm_LineNUMBER_YOURINITIALS'

<u>Answer</u>- Please see attachment photo in JPEC formad with the filename: 'Q3_125cm_ID21'
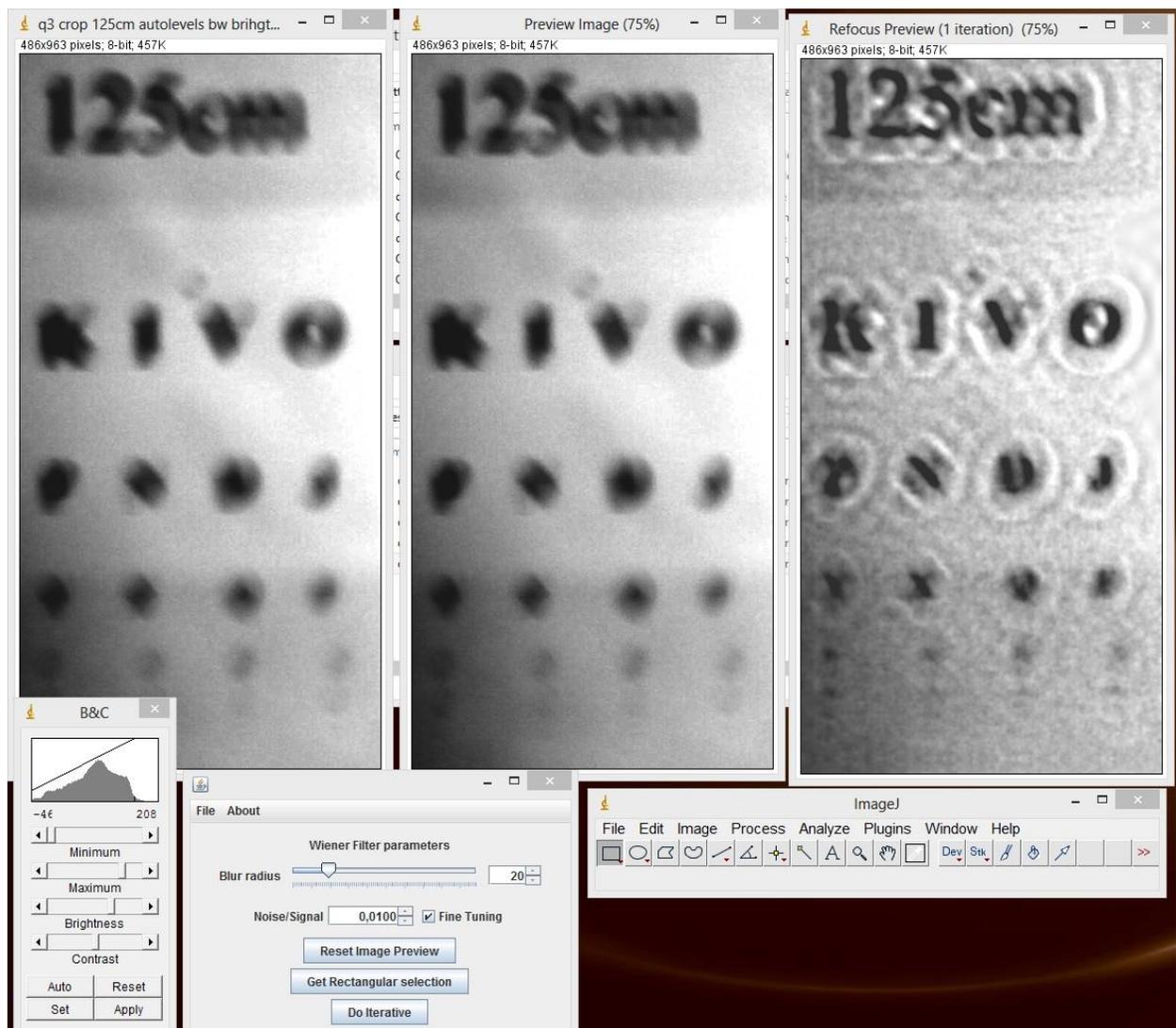
75 cm, 4th line:
Please save and submit your results using filename: 'Q3_75cm_Line4_YOURINITIALS'

Answer- Please see attachment photo in JPEC formad with the filename: 'Q3_75cm_Line4_ID21'
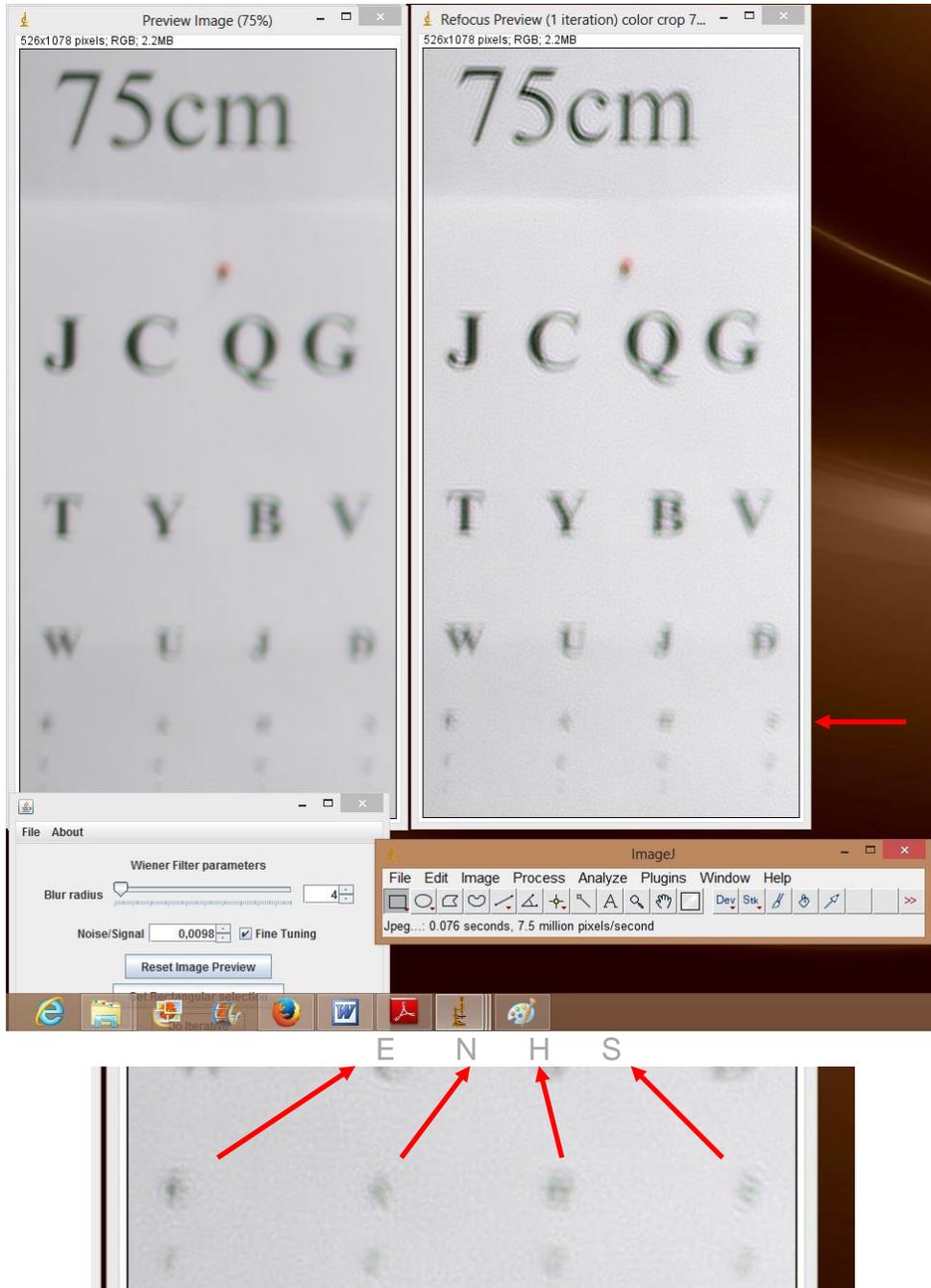
75 cm, 5th line:
Please save and submit your results using filename: Q3_75cm_Line5_YOURINITIALS'

No result. (Lack of time)

any other results: optional:
Please save and submit your results using filenames: 'Q3_DISTANCEcm_LineNUMBER_YOURINITIALS'

Answer- Please see attachment folder with several test photos and resaults using the software "imagej" with the filename:
'Q3_Severalfortest_imagej_deblure_ ID21'

Question 4: Motion deblur test

Qn.4A:

Please specify (i) <u>all software tools or processing steps</u>, (ii) <u>all enhancement filters</u> used (in order) and (iii) <u>all specific parameter settings.</u> The information you provide should have sufficient detail so that anyone could independently reproduce your results.
If you wish to provide results for different regions of interest in the image, please specify their coordinates and/or indicate the region in a small thumbnail, and use the filenames: "Q4A_RegionNUMBER_YOURINITIALS".

Region NUMBER: coordinates and/or thumbnail:

Answer-: Please see attachment folder with photos and results using the software "DeblurMyImage" with the filename:
"Q4A_ DeblurMyImagesoftwaredraft_ID21"

Qn.4B:

Please specify (i) <u>all software tools or processing steps</u>, (ii) <u>all enhancement filters</u> used (in order) and (iii) <u>all specific parameter settings.</u> The information you provide should have sufficient detail so that anyone could independently reproduce your results.

If you wish to provide results for different regions of interest in the image, please specify their coordinates and/or indicate the region in a small thumbnail, and use the filenames: "Q4A_RegionNUMBER_YOURINITIALS".

Region NUMBER: coordinates and/or thumbnail:

Answer-: Please see attachment folder with photos and results using the software "DeblurMyImage" with the filename:
"Q4A_ DeblurMyImagesoftwaredraft_ID21"