Lab 3. Task 1- preparation task
Template for answers

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Student names and LiU-IDs: (Max 2 students per group):
1. ricgo595
2. marf808
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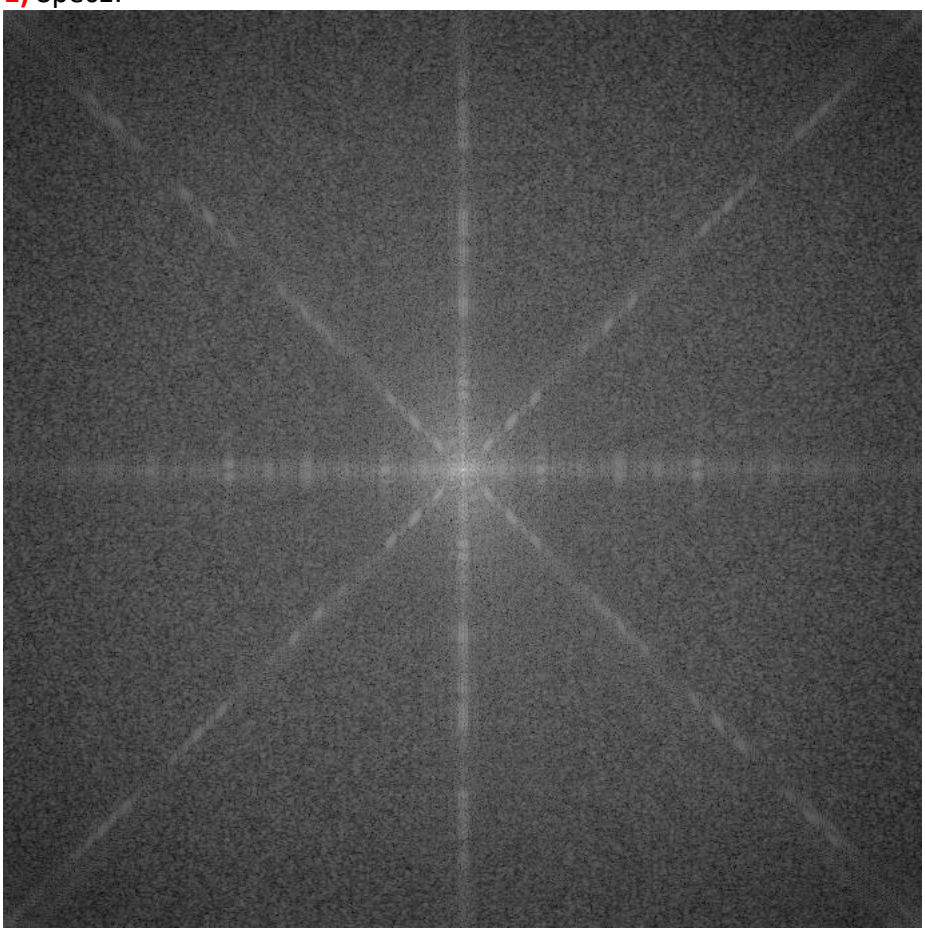
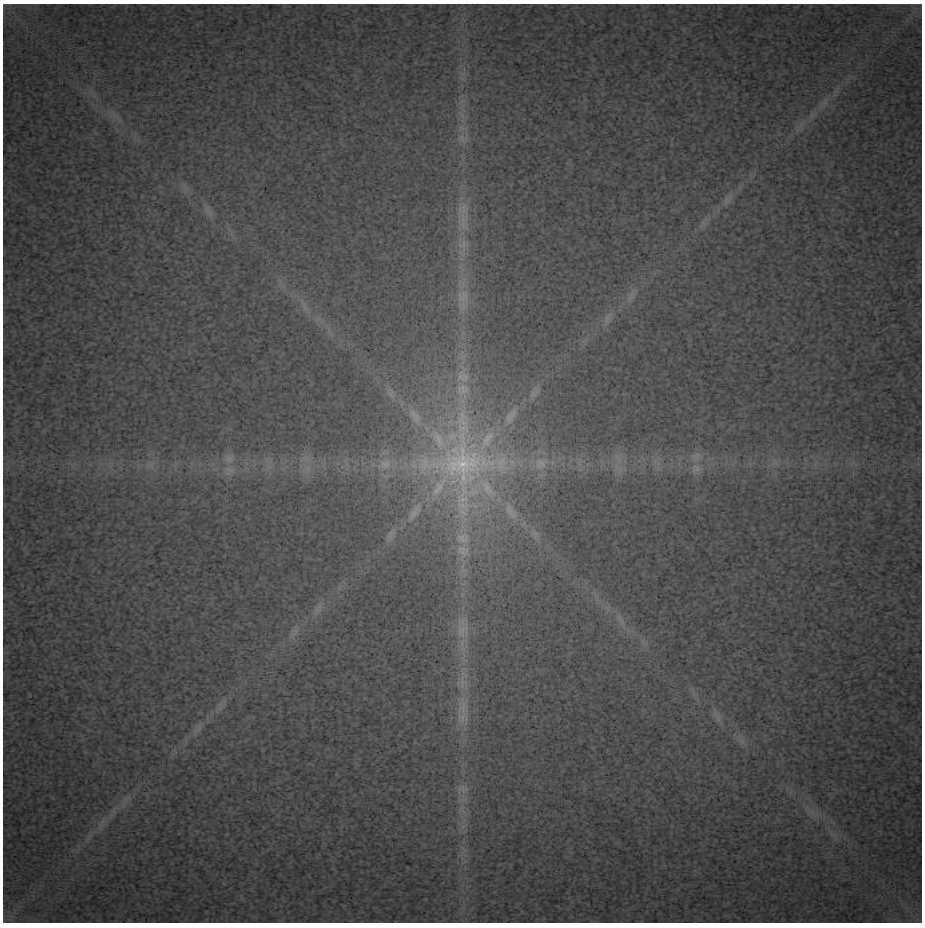
Version (in case you need to re-submit):
V1

1) 2D Fourier spectrum

1) Spec1:



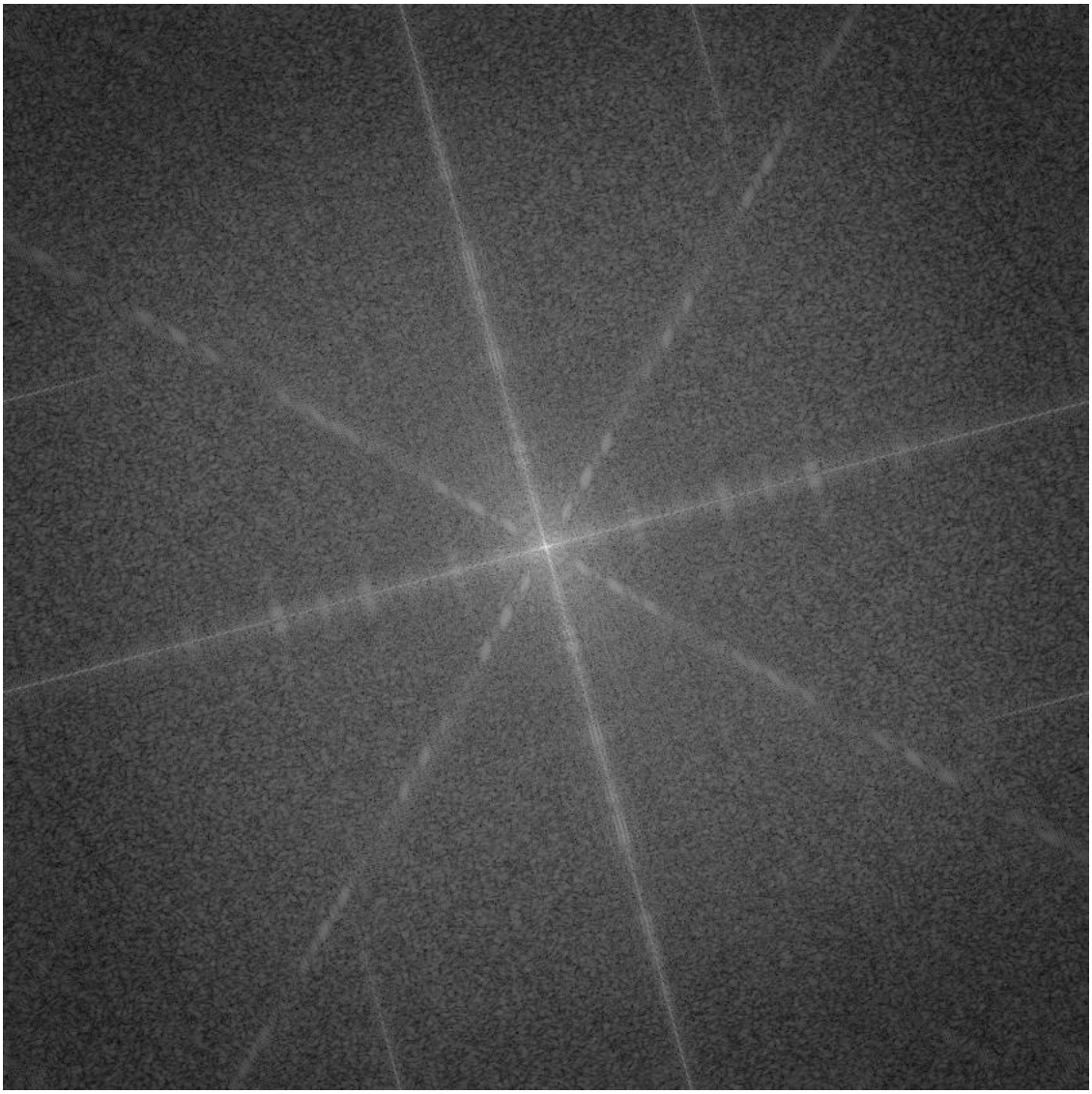
2) Spec2:



3) Are there any differences between $Spec2$ and $Spec1$? How does shift affect the spectrum of the Fourier transform?

Vi ser ingen skillnad på storleken eller i de horisontella eller vertikala linjerna av spektrumet.

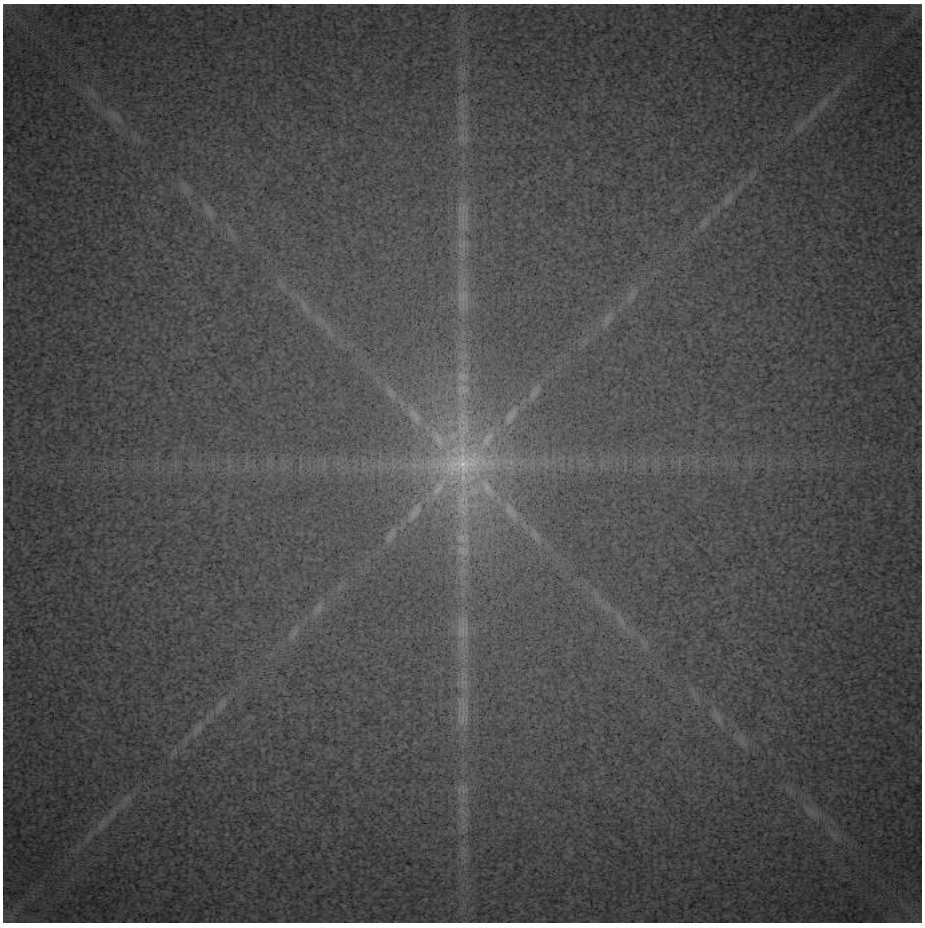
4) Spec3:



5) Are there any differences between $Spec3$ and $Spec1$? How does rotation in the spatial domain affect the Fourier spectrum? (Ignore some distortions caused by the black area around the image after rotation (cTP_rot))

Man ser tydliga linjer i kanterna och hur spektrumet har lyckats rotera.

6) Spec4:



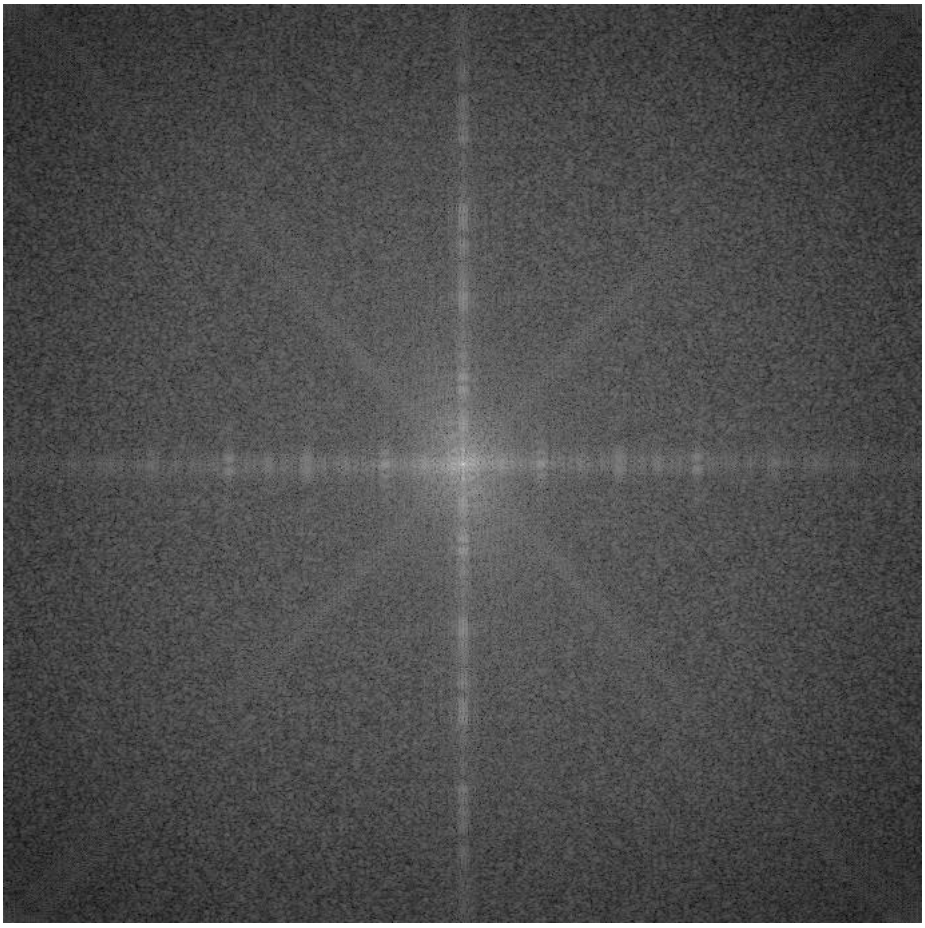
7) Compare $Spec4$ and $Spec1$ and explain how the elimination of vertical bars affected the spectrum. **HINT:** Look specially at the **horizontal** axes of the spectrum.

Vi ser att det försvunnit intensitet runt de horisontella axlarna i spec4. Detta har ett säkert samband med att de vertikala linjerna i cTP2 är borta.

8) Explain what would happen to the spectrum if the horizontal bars were eliminated from cTP?

Skulle de horisontella linjerna försvinna från cTP skulle det säkert påverka de vertikala linjerna i spektrumet.

9) Spec5:



10) Compare $Spec5$ and $Spec1$ and explain how the elimination of diagonal bars affected the spectrum. **HINT:** Look specially at the diagonal axes of the spectrum.

De diagonala sträcken försvann från orginalspektrumet i bilden spec5.

2) Period and Frequency

11) Where would these three dominant peaks appear if $v2$ is transposed, i.e. if the vertical bars become horizontal?

Skulle linjerna vara horisontella skulle tre stycken tydliga prickar dyka upp i en vertikal linje längs mitten.

12) What is the frequency of these stripes? Where would the three dominant peaks in the spectrum for this image appear?

Frekvensen borde vara f = 1/4 vilket motsvarar 0.25 cyklar per pixel. De tre dominanta pixlarna borde uppstå i en horisontell linje längs mitten.

13) What is the frequency of these stripes? Where would the three most dominant peaks in the spectrum for this image appear?

Frekvensen borde bli 1/300 vilket motsvarar 0.003 cyklar per pixel.
De tre dominanta pixlarna borde uppstå längs den horisontella linjen i mitten som borde ligga väldigt nära varandra.

3) The importance of the spectrum and the phase angle

14) E1_E2:

15) E2_E1:

16) Is the spectrum or the phase angle that has more effect on the structure of an image based on your visual analysis of the above results?

Fasvinkeln har mer effekt på strukturen eftersom den framkommer mer tydligt på bilden än vad spektrumet gör.

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