

## Use Case 1.0

### Converting an Image into a Spreadsheet

**Primary Actor:** A student or teacher trying to convert an Image into a spreadsheet.

**Stakeholders and Interests:** The student or teacher converting the image.

**Preconditions:** The user must have an image in one of the accepted formats.

**Postconditions:** The program has generated a spreadsheet with the R,G,B values of each pixel in the image in a csv format.

**Main Success Scenario:**

1. The user starts the program.
2. The user opens the image selection interface
3. The user selects their image
4. If the image is properly formatted, then it is accepted.
5. The user will then generate a spreadsheet using the program.
6. The user then saves the spreadsheet.

**Extensions and Alternative Flows:** If the image is too large for the spreadsheet to be read by a specific program, the user must check the size reduction box. The user will be informed if the image is too large for certain versions of Excel or Open Office.

## Use Case 2.0

### Converting a Spreadsheet into an Image

**Primary Actor:** A student or teacher trying to convert a spreadsheet into an image.

**Stakeholders and Interests:** The student or teacher converting the spreadsheet.

**Preconditions:** The user must have a properly formatted spreadsheet, with an X,Y,R,G,B value for each desired pixel in the image.

**Postconditions:** The program has generated an image using the RGB values of each pixel as defined in the spreadsheet.

**Main Success Scenario:**

1. The user starts the program.
2. The user opens the spreadsheet selection interface
3. The user selects their spreadsheet
4. If the spreadsheet is properly formatted, then it is accepted.
5. The user will then clicks the spreadsheet to image conversion button.
6. The user can then save the image now displayed in the main window.

## Use Case 3.0

**Extracting Program onto Computer (Windows)**

**Primary Actor:** A student or teacher trying to put the program onto a machine.

**Stakeholders and Interests:** The student or teacher who wish to put the program on a machine.

**Preconditions:** The user must have write access to the folder which they will be extracting the executable's contents.

**Postconditions:** The program has been extracted onto the folder specified by the user, who can now run the program executable.

**Main Success Scenario:**

1. User double-clicks on the packaged executable which will commence extraction.
2. User chooses folder destination.
3. User sees extraction process and finally sees an exe with other files. The user can then create a shortcut or run the program executable.

**Extensions and Alternative Flows:** If the folder does not allow data to be written to it, the executable will throw an error stating it cannot write to specified folder (just like most other programs). The user must then choose another folder and ensure that he or she has write access to it.

## Use Case 4.0

**Running from a USB**

**Primary Actor:** A student or teacher trying to run the program from USB.

**Stakeholders and Interests:** The student or teacher who wish to run the program on a machine that does not have the Pixel Spreadsheet program on it.

**Preconditions:** The user must have extracted the program contents onto the USB drive.

**Postconditions:** The program has been extracted onto the USB folder specified by the user, who can now run the program executable.

**Main Success Scenario:**

1. User double-clicks on the program executable.
2. User uses program as normal.

**Extensions and Alternative Flows:** If the user disconnects the flash drive from the computer while still using the program, the program will error out as soon as it has to import/export an image. Please note that although there should be no noticeable lag issues, most computers will write data to flash drives at a slower rate (such as a large spreadsheet being saved onto a flash drive).

## Use Case 5.0

### Blank Values in Spreadsheet

**Primary Actor:** A user trying to learn the fundamentals of how a digital image works

**Stakeholders and Interests:** The user

**Preconditions:** The user saved a spreadsheet, with X,Y,R,G, and B values, but some RGB fields are left blank.

**Postconditions:** The program has imported a spreadsheet with these empty values.

**Main Success Scenario:**

1. The user starts the program.
2. The user clicks on the Import button for a spreadsheet.
3. The user selects their spreadsheet.
4. The program scans the values of the image, and interprets blank rgb values as zeroes
5. The user can then convert spreadsheet to image.

**Note:** This makes clearing out a color channel very easy. If a user wants to get rid of all

red in an image, he or she can just clear the r column.

## Use Case 6.0

### Invalid Number of Pixels

**Primary Actor:** A student or teacher trying to convert a spreadsheet into an image.

**Stakeholders and Interests:** The student or teacher.

**Preconditions:** The user has a picture, but the image is so large that the resulting number of pixels exceeds one million, which leads to data loss in Excel/Calc

**Postconditions:** The program has imported the picture.

**Main Success Scenario:**

1. The program scans the values of the image, then notifies the user there are too many pixels.
2. The program automatically resizes the image to prevent data loss in Excel, even if the user did not click the “shrink” checkmark.
3. The user can continue to use the program as normal.

**Extensions and Alternative Flows:** The user can select another image if he or she does not want the image to be resized.

## Use Case 7.0

### Too Many Pixels Again

**Primary Actor:** A student or teacher trying to convert an image into a spreadsheet that has a large number of pixels.

**Stakeholders and Interests:** The student or teacher.

**Preconditions:** The user has an image with a very large number of pixels and the user is aware his or her image will not be converted into a spreadsheet size supported by Excel.

**Postconditions:** The user has a spreadsheet too large to open in a spreadsheet program, such as Excel 2002.

**Main Success Scenario:**

1. The user starts the program.
2. The user clicks on the Import button for an image
3. The user clicks on the “Shrink” checkmark for the image to be resized.
4. The user presses the convert button.
5. The program generates a spreadsheet that will result in no data loss (the picture becoming cut off)

False Use Case 1.0

**Network Error**

**Primary Actor:** A user (Student, Teacher, Network Admin) attempting to use the program to convert an image that is accessed over a network.

**Stakeholders and Interests:** The student, teacher, or network administrator.

**Preconditions:** The user has an image stored on another device on the network than the one they are using.

**Postconditions:** The user is informed of an error in receiving the image.

**Main Success Scenario**

1. The user starts the program
2. The user clicks on the image import button
3. The user selects an image on a different device in the network.
4. There is an error with the connection and the image is either not received at all or only partly received.
5. The program will give an error and the user can try to restart the program or re-import another picture.