Image Flattener User Manual

By: Matthew Chan

Objective:

1) To transform images such as figure 1 into a more usable format.
2) By using this program, users will be able to convert images such as figure 1 into more readable images such as that found in figure 2.

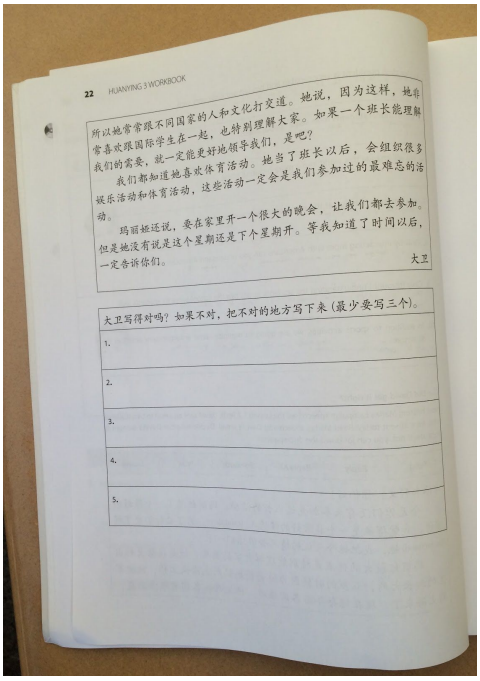


Figure 1

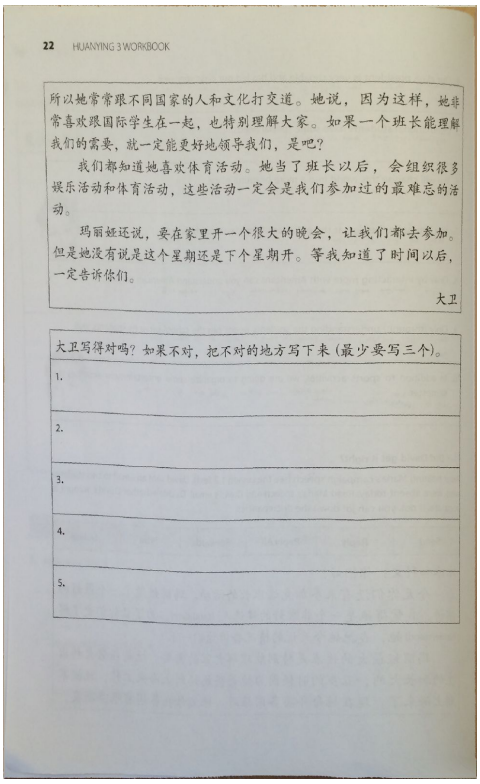


Figure 2

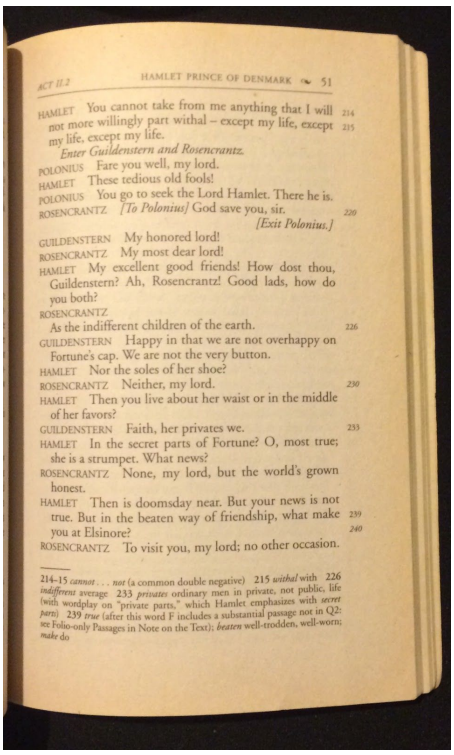
Instructions:

Requirements to Work:

1) Clearly defined outlines of the page you want to flatten (Note: The edges of the image DO NOT count)
    a) Figure 1 has good lighting with a dark background, creating plenty of contrast between the page and the background.
    b) Figure 2 would not work because the background and foreground have approximately the same brightness, which would cause the program to crash.
2) Obvious corners of the image
    a) Both Figure 1 and 2 would be successful, as there are obvious corners to the page.
3) All parts of all edges of the page visible within the image
    a) Both Figure 1 and 2 have all parts of the edges of the page visible within the image
4) The background of the image should be a dark color with small amounts of noise
    a) Dark background increase contrast between the background and page, allowing the program to more accurately identify edges.
    b) Both Figure 3 and 4 qualify.

How to Operate:

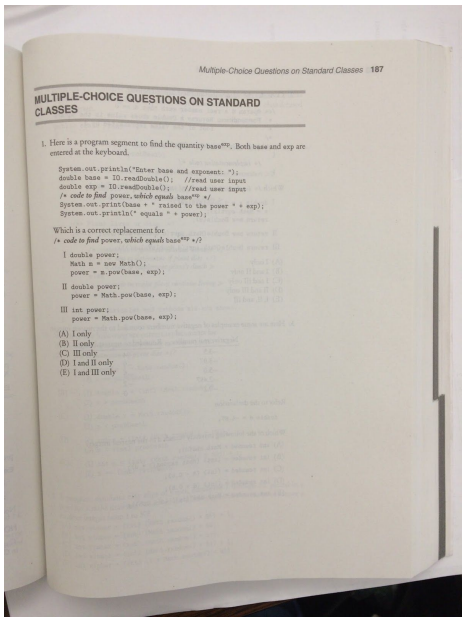
1) Optional: Follow steps outlined below to optimize chance of success, speed, and accuracy
2) Start Program
    a) Open Eclipse
    b) Navigate to TBFlattener
    c) Open main class
    d) Run Program
3) Select File
    a) Use the file chooser to select file


ACT III.2 HAMLET PRINCE OF DENMARK 51

HAMLET You cannot take from me anything that I will not more willingly part withal – except my life, except my life, except my life.
Enter Guildenstern and Rosencrantz.
POLONIUS Fare you well, my lord.
HAMLET These tedious old fools!
POLONIUS You go to seek the Lord Hamlet. There he is.
ROSENCRANTZ *[To Polonius]* God save you, sir.
[Exit Polonius.]
GUILDENSTERN My honored lord!
ROSENCRANTZ My most dear lord!
HAMLET My excellent good friends! How dost thou, Guildenstern? Ah, Rosencrantz! Good lads, how do you both?
ROSENCRANTZ
As the indifferent children of the earth.
GUILDENSTERN Happy in that we are not overhappy on Fortune's cap. We are not the very button.
HAMLET Nor the soles of her shoe?
ROSENCRANTZ Neither, my lord.
HAMLET Then you live about her waist or in the middle of her favors?
GUILDENSTERN Faith, her privates we.
HAMLET In the secret parts of Fortune? O, most true; she is a strumpet. What news?
ROSENCRANTZ None, my lord, but the world's grown honest.
HAMLET Then is doomsday near. But your news is not true. But in the beaten way of friendship, what make you at Elsinore?
ROSENCRANTZ To visit you, my lord; no other occasion.

214–15 *cannot . . . not* (a common double negative) 215 *withal* with 226 *indifferent* average 233 *privates* ordinary men in private, not public, life (with wordplay on "private parts," which Hamlet emphasizes with *secret parts*) 239 *true* (after this word F includes a substantial passage not in Q2; see Folio-only Passages in Note on the Text); *beaten* well-trodden, well-worn; *make* do

Figure 3
A valid image. This passes all requirements.


Multiple-Choice Questions on Standard Classes 187

MULTIPLE-CHOICE QUESTIONS ON STANDARD CLASSES

1. Here is a program segment to find the quantity base^{exp}. Both base and exp are entered at the keyboard.

```
System.out.println("Enter base and exponent: ");
double base = IO.readDouble();  //read user input
double exp = IO.readDouble();   //read user input
/* code to find power, which equals base^exp */
System.out.print(base + " raised to the power " + exp);
System.out.println(" equals " + power);
```

Which is a correct replacement for
/ code to find power, which equals base^{exp} */?*

```
I double power;
  Math m = new Math();
  power = m.pow(base, exp);

II double power;
   power = Math.pow(base, exp);

III int power;
   power = Math.pow(base, exp);
```

(A) I only
(B) II only
(C) III only
(D) I and II only
(E) I and III only

Figure 4
An invalid image. This fails requirement 1.

b) Currently, only jpeg and png files are supported

4) Block out Text
    a) Use the box to cover up as much text as possible, but DO NOT OBSCURE EDGES OF THE PAGE. If you do, the image will not process correctly.
5) Select Quality
    a) Click on the dropdown menu to select a quality
    b) Higher qualities cause the program to run slightly slower.
6) Execute Program
    a) Press the run button.
    b) Wait.
    c) Wait.
    d) Wait some more.
    e) Jump up and down excitedly when the program finishes execution!
7) See output!
    a) The file should be named "final.png" on the desktop.

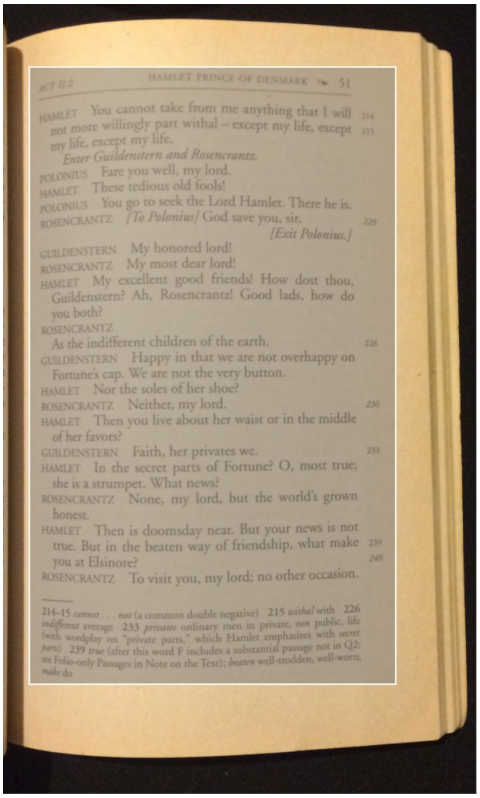


Figure 5
A valid box covering the text, but not the edge of the page.

Optimizations:

Remove Unnecessary Noise:

1) If the exact boundaries of the page to be flattened can be identified, a user can overwrite the extra material with background material.
    a) Using a basic image editor, users can copy background material to cover parts of the image that are unnecessary.
    b) Be sure to keep the borders of the page uncovered

Providing Artificial Boundaries:

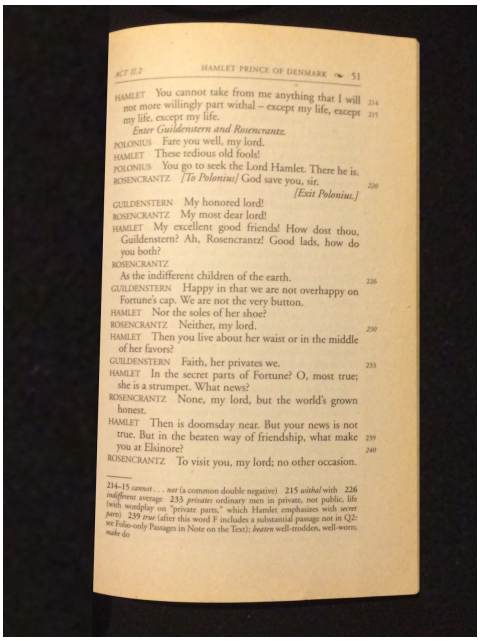


Figure 6

1) By providing artificial boundaries, users can improve accuracy and efficiency of the program.
    a) Using a basic image editor, users can copy background material to provide page edges with more contrast.
    b) In Figure 1, the right side boundary of the page does not have enough contrast for the program to identify it as an edge.
        i) Figure 8 illustrates a user-edited version of figure 1 with artificial boundaries.

Figure 3 with unnecessary noise removed.

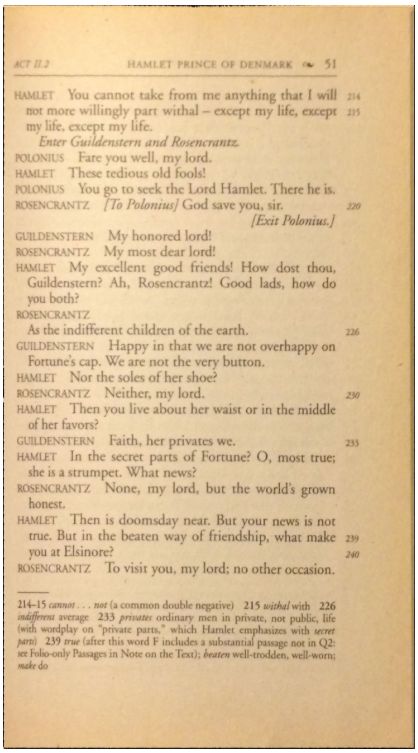


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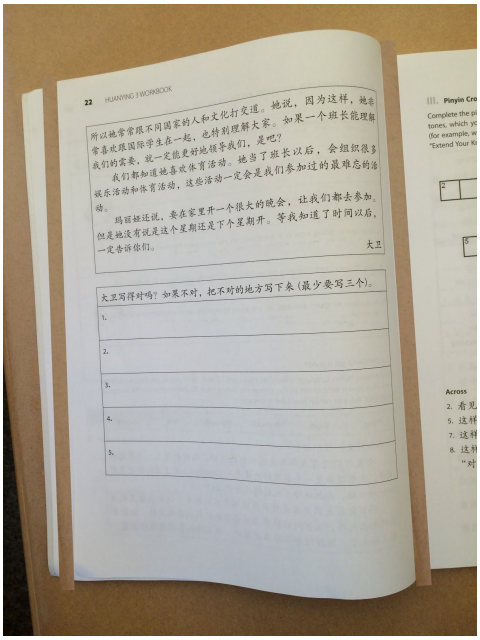
Figure 7
The output of the optimized Figure 6.



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所以她常常跟不同国家的人和文化打交道。她说，因为这样，她非常喜欢跟国际学生在一起，也特别理解大家。如果一个班长能理解我们的需要，就一定能更好地领导我们，是吧？

我们都知道她喜欢体育活动。她当了班长以后，会组织很多娱乐活动和体育活动，这些活动一定会是我们参加过的最难忘的活动。

玛丽娅还说，要在家里开一个很大的晚会，让我们都去参加。但是她没有说是这个星期还是下个星期开。等我知道了时间以后，一定告诉你们。

大卫

大卫写得对吗？如果不对，把不对的地方写下来（最少要写三个）。

1.
2.
3.
4.
5.

Figure 8

	A copy of Figure 1, with artificial boundaries for the page.

Examples

Unoptimized

1) Figures 3 and 5 illustrate the input and output of an unoptimized image.
2) Figure 1 fails when processed unoptimized, but works when optimized (see below)

Optimized

1) Figures 6 and 7 illustrate the input and output of an optimized image.
2) Figure 8 is the user-corrected version of Figure 1, and has the output of Figure 2 when processed.

Certified Test Cases

1) Link here: https://drive.google.com/drive/folders/0B6XuEJitAjFsRHdqelhsd2dYcUU?usp=sharing