1. For Project 3, I had trouble designing and keeping track of the flow of my program. When I first read the spec, it was very overwhelming. For the previous project I could easily come up with a general idea of what to do and just begin writing my code. This time though I had to write out a plan, split it into sections, and then work on each part. As I was working on each section, I would sometimes lose track of what I was trying to do in the grand scheme of the program. I found it helpful to write lots of comments and notes to remind myself what I was doing.

isColor function takes in a char

if the char denotes a one of the colors, returns true

else returns false

countBeats function takes in beginning position, end position, and a string

repeatedly:

checks if char/group of chars at beginning position is a beat

increments beginning position appropriately depending on how many chars are in the beat

returns the number of beats

hasProperSyntax function takes in a string

if string is empty, returns true

if the last char of the string is not a /, returns false

if the first char of the string is a digit, returns false

repeatedly:  
 checks if each char is part of a syntactically correct beat

if this is not true, returns false

if it is true, returns true

checkSustainSlashes function takes in a string

repeatedly:  
 if we are given two digits for a number of slashes

stores this value

repeatedly:

if the correct number of slashes are not present

returns the beat which is not a slash but should be

else if we are given one digit for a number of slashes

stores this value

repeatedly:

if the correct number of slashes are not present

returns the beat which is not a slash but should be

returns -1, meaning the number of slashes for the sustained notes are correct

checkSustainLength function takes in a string

repeatedly through the string:

if the char is a color

if the number of slashes specified is 0 or 1

returns the beat which specifies incorrectly

returns -1, meaning that the length of the sustained notes was not 0 or 1

checkPremature function takes in a string

repeatedly through the string backwards:

if we are given two digits for the number of slashes

stores this value

if this value is greater than the number characters left at the end of the string

returns one more than the beats in the string

else if we are given one digit for the number of slashes

stores this value

if this value is greater than the number characters left at the end of the string

returns one more than the beats in the string

returns -1, meaning the string did not end prematurely

convertible function takes in a string

if the string is empty, returns empty string

repeatedly

if we have a color followed by two digits for the number of slashes and a slash

stores this value

repeatedly

adds the color to string in progress (capitalized)

increments position appropriately

else if we have a color followed by one digit for the number of slashes and a slash

stores this value

repeatedly

adds the color to string in progress (capitalized)

increments position appropriately

else if we have a color and a slash

adds the color (lower case)

increments position appropriately

else if we have a slash

adds an “x”

increments position appropriately

returns the string we created

function convertTune takes in a string tune, string instructions, and int badBeat

if tune has incorrect syntax

returns 1

if tune has correct syntax and ends prematurely

if the number of slashes for sustained notes are correct and the length of the sustained notes were not 0 or 1

sets badBeat equal to one more than the number of beats in tune

returns 4

if tune has correct syntax but has an incorrect number of slashes for a sustained note

sets badBeat equal to beat that should be a slash but is not

returns 2

if tune has correct syntax but has a sustained note with a length of 0 or 1

sets badBeat equal to the incorrect beat

returns 3

else

sets instructions equal to the converted tune

returns 0

main function

asks user to enter a string

calls function convertTune with the string as tune

prints instructions and badBeat

3.

**For hasProperSyntax**

zero beats ()

only slashes (///)

only color followed by a slash (G/R/r/y/B/O/)   
only color followed by a digit followed by slash (G4/y5/O7/Y3/b4/)

only color followed by two digits followed by slash (R99/y03/O54/)

combination of slashes, color followed by slash, color followed by a digit followed by slash, and color followed by two digits followed by slash (//g07////Y5/b///)

is only colors (gYrR)

colors followed by digits missing slashes (B09/O6y2/)

includes space ( /)

includes special character (/\*)

includes other letters that do not denote color (g7/r43///v22/)

only spaces, special characters, and other letters (naf j&\*.)

**for convertTune**

Improper syntax

Is only colors (gYrR)

Colors followed by digits missing slashes (B09/O6y2/)

includes space (g// )

includes special character (/))

includes other letters that do not denote color (G7/T43///o22/)

only spaces, special characters, and other letters (e9. KLKL;’)

proper syntax, sustained note contains a beat that is not a slash, no other issues

only incorrect sustained note (G5//g3///)

incorrect sustained note at the beginning (Y05////g2//)

incorrect sustained note at the end (B03///y2/g/)

incorrect sustained note in the middle(O2//R3//B/)

proper syntax, beat specifies a sustained note of length less than 2, no other issues

only too short sustained note (r0/)

too short sustained note at the beginning (g1/y/)

too short sustained note at the end (o2//r1/)

too short sustained note in the middle (r3///o1/o/)

proper syntax, tune ends prematurely, no other issues

Only consists of a beat ends prematurely (g3//)

Ends with a beat that ends prematurely (y/g4///)

Proper syntax, sustained note contains a beat that is not a slash, and beat specifies a sustained note of length less than 2

Incorrect sustained note comes first (R3///O2/r1///B/)

Beat that specifies a too short sustained note comes first (r3///o1/O2//o/)

Proper syntax, sustained note contains a beat that is not a slash, and tune ends prematurely (O2//R3//B3//)

Proper syntax, beat specifies a sustained note of length less than 2, and tune ends prematurely

(r3///o1/o5//)

Proper syntax, sustained note contains a beat that is not a slash, beat specifies a sustained note of length less than 2, and tune ends prematurely

Incorrect sustained note comes first (R3///O2/r1///B2/)

Beat that specifies a too short sustained note comes first (r3///o1/O2//o3///r2/)

Proper syntax, no issues

zero beats ()

only slashes (//)

only color followed by a slash (G/R/r/y/B/O/)   
only color followed by a digit followed by slash (G4////y5/////O7///////Y3///b4////)

only color followed by two digits followed by slash (R11///////////y03///O08////////)

combination of slashes, color followed by slash, color followed by a digit followed by slash, and color followed by two digits followed by slash (//g07///////Y5/////b///)