

Documentation Christmas Tree

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November 27, 2022, Kesselsdorf

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  /|\  
  A  
  /X\  
  /XXX\  
  /XoXXX\  
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  /XXXXXXOXX\  
  /XoXXX_XXXXX\  
  /XoXX*XX_XXXXX\  
  |||
```

Description

This program prints out a randomly generated christmas to the linux terminal. It has been tested under Ubuntu 22.04.

Structograms

globals

STAR	{star pattern}
TRUNK	{trunk pattern}
BACKGROUND_ELEMENT	{background element char}
START_CHAR_ELEMENT	{tree start element}
FILLING_ELEMENT	{tree filling element}
STOP_CHAR_ELEMENT	{tree stop element}
ORNAMENTS	{holds ornaments}
ORNAMENT_FREQUENCY	{divider to reduce the random occurrence of ornaments}
RED	{string color red}
BROWN	{string color brown}
YELLOW	{string color yellow}
GREEN	{string color green}
DARK_GREEN	{string color dark green}
WHITE	{string color white}
X_OFFSET	{horizontal tree offset in terminal}
Y_OFFSET	{vertical tree offset in terminal}

function max

	uint max (const uint val1, const uint val2)	
<	return val1 > val2 ? val1 : val2	>

function main

set <i>top_height</i> to random value
calculate <i>top_width</i>
calculate total <i>tree_width</i>
calculate total <i>tree_height</i>
set <i>top_start</i>
set <i>trunk_start</i>
allocate memory for <i>row</i>
allocate memory for <i>last_row</i>
set terminal color to <i>WHITE</i>
for 0 to Y_OFFSET
for 0 to tree_width
OUTPUT BACKGROUND_ELEMENT
OUTPUT new line
for Y_OFFSET to top_start
calculate space_count
0 to tree_width
before or after star fields?
true
false
OUTPUT BACK- GROUND_ELEMENT
OUTPUT STAR element
OUTPUT new line
for top_start to trunk_start
calculate line_tree_width
calculate space_count
not in first row of top?
true
false
last_row = row
0 to tree_width
OUTPUT colored tree element
assign tree element to row
OUTPUT new line

function main *continued*

for trunk_start to tree_height - Y_OFFSET			
calculate space_count			
for 0 to tree_width			
before or after trunk fields?			
true		false	
OUTPUT	BACK-	OUTPUT	
GROUND_ELEMENT		TRUNK	ele-
		ment	
OUTPUT new line			
for tree_height - y_offset to tree_height			
for 0 to tree_width			
OUTPUT BACKGROUND_ELEMENT			
OUTPUT new line			
free allocated memory of row			
free allocated memory of last_row			

Future Improvements

- Animated ornaments in tree
- Add background music
- Find out, how to get a fancier yellow color for the star

Personal summary

I learned a lot about programming in ANSI-C. Also this is my first L^AT_EX-document.

Thanks to Professor Hara for this nice exercise.