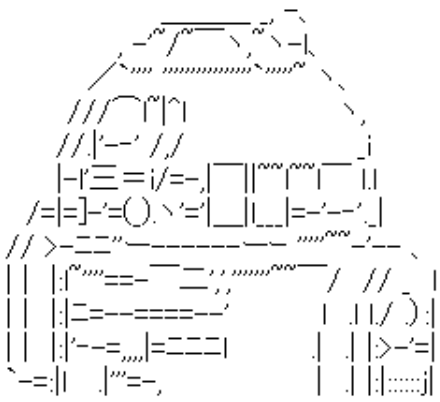
GSET - Programming with Mr. Hill - Summer 2021

Introduction to C++ - Challenge 8 - ASCII Art

Overview:

We are going to participate in the annual GSET ASCII art looping challenge!

ASCII art: What is it? Awesome.



System Requirements:

- **Computer**: A computer is required to complete this tutorial. Any OS should work.
- **MCU or PC:** This exercise can be completed with MCU or a desktop programming environment. If you use an MCU, print the art to the *serial monitor* or other serial terminal. If you use a desktop programming environment, print the art to the available terminal.
- **C++:** You can use the online C++ compiler (OnlineGDB) or a C++ compiler of your choice.

Problem Statement:

Complete as many levels as possible by writing a C++ program to generate each of the images shown.

Note: Complete the levels in any order. If get stuck, move on to a different level. Also, each page contains a new type of challenges. If you are bored or stuck, you can move to the next page of levels.

The Levels:

- Level 0: The Line

```
oooooooooooooooooooooooooooooooooooooooooooooooooo
```

- Level 1: The Dotted Line

```
 o o o o o o o o o o o o o o o o o o o o o o o o o
```

- Level 2: The Dash-Dotted Line

```
o--o--o--o--o--o--o--o--o--o--o--o--o--o--o--o--o-
```

- Level 3: The Dash-Dotted-Asterisk Line

```
*o-o-o*o-o-o*o-o-o*o-o-o*o-o-o*o-o-o*o-o-o*o-o-o*o
```

- Level 4: The Rectangle

```
oooooooooooooooooooo
oooooooooooooooooooo
oooooooooooooooooooo
oooooooooooooooooooo
oooooooooooooooooooo
oooooooooooooooooooo
oooooooooooooooooooo
oooooooooooooooooooo
oooooooooooooooooooo
oooooooooooooooooooo
```

- Level 5: The Stripes

```
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
oooooooooooooooooooooooooooooooooooooooooooooooooo
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
oooooooooooooooooooooooooooooooooooooooooooooooooo
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
oooooooooooooooooooooooooooooooooooooooooooooooooo
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
oooooooooooooooooooooooooooooooooooooooooooooooooo
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
oooooooooooooooooooooooooooooooooooooooooooooooooo
```

- Level 6: The Grid

```
ooooooooooooooooooooooooooooooooooooooooooooooooooo
oxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxo
oxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxo
oxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxo
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ooooooooooooooooooooooooooooooooooooooooooooooooooo
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oxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxoxxxxo
ooooooooooooooooooooooooooooooooooooooooooooooooooo
```

- Level 7: The Triangle

```
x
xx
xxx
xxxx
xxxxx
xxxxxx
xxxxxxx
xxxxxxxx
xxxxxxxxx
xxxxxxxxxx
```

- Level 8: The Inverted Triangle

```
xxxxxxxxxx
xxxxxxxxx
xxxxxxxx
xxxxxxx
xxxxxx
xxxxx
xxxx
xxx
xx
x
```

- Level 9: The Pyramid

```
     x
    xxx
   xxxxx
  xxxxxxx
 xxxxxxxxx
xxxxxxxxxxx
```

If you you completed all 10 levels you can create your own level and challenge yourself or one of your peers.

Program Minimum Requirements:

The program should accomplish the following tasks.

- The ASCII art should be printed to the terminal window using a C++ program.
- The use of while loops or for loops is encouraged. Hardcoding the images into the program is discouraged.

Program Additional Requirements:

The program should accomplish the following tasks.

- The source of the image should be an .png file. Use OpenCV or other to load a .png file into your program.
- An ASCII art version of the image should be printed to the terminal window using the C++ program.

Part 3 - Testing:

1. Complete the C++ code to the solve the problem described.

2. Test your code with different inputs. Is the answer correct? How do you know? Are there certain inputs that do not work?

3. Save your code with the download button or use copy and paste. You can view and edit the code in any text editor. Also, save a copy of the program output for your tutorial summary.

Solution Code:

Tutorial Summary:

A summary is not required for this challenge.

Submission on Teams:

Use the appropriate shared folder on Teams to submit your program and summary. Submit the fol1owing items with your TNTech username in the filenames as shown below.

Files for Tutorial 1 (TNTech Username : twhill21)

- C++ Source Code: **twhill21_challenge8.cpp**