TOBB University of Economics and Technology
Department of Computer Engineering
BIL395 Programming Languages
Instructor: Dr. Osman Abul

Assignment 2
Date due: February 29, 2020

Subject: Composing $\mathcal{P}eakasso$ programs from canvas paintings

Problem: In this assignment, you are expected to implement a C/C++ program which does the opposite of what has been asked in the previous assignment (Assignment 1). More concretely, you are given a painted canvas for which you are expected to output a $\mathcal{P}eakasso$ program which generates the painted canvas when run. Moreover, you have an optimization objective which asks for minimizing the number of PAINT-CANVAS statements. To achieve this objective you need to fully exploit your background programming and algorithmic talents.

An example input and output files are provided next.

```
12 3
*****
  *******
  *******
```

The first line in the input file declares the canvas size, after which the canvas itself starts. With the input painting specification above, your C/C++ program should output something like the following $\mathcal{P}eakasso$ program.

```
PROGRAM mypeakasso; !!  The number of PAINT-CANVAS statements is 2
CANVAS-INIT-SECTION :
CONST CanvasX = 12 ; CONST CanvasY = 3 ; CursorX = 1 ; CursorY = 1 ;
BRUSH-DECLARATION-SECTION : !!  Declare brushes
BRUSH b1 = 5 1, b2= 7 2;

DRAWING-SECTION : !!  Start drawing
PAINT-CANVAS b1;
MOVE CursorX TO 3 ;
MOVE CursorY TO 2 ;
PAINT-CANVAS b2;
EXHIBIT-CANVAS;
```

Other important issues are as follows.

- Make sure that your program is non-interactive, i.e., no RENEW-BRUSH statement exists in your generated program.
- The number of the PAINT-CANVAS statements within your program needs to be written on the first line within the comment as shown in the example above.
- The output program should contain a single final EXHIBIT-CANVAS statement.
- Clearly, there are many ways of obtaining the same painting. To this end, programs with smaller number of PAINT-CANVAS statements will be credited higher. This is the optimization objective which is very important in grading your solution.
- Never use any third party C/C++ library.

Implementation

Use GNU C/C++ compilers to compile your C/C++ program.

Delivery

Send your solution, **a single C/C++ source file**, to the course assistant Esra at `esranayaz@gmail.com`.

Important

You may keep the previous team or declare independence if you are unhappy with the teammate in the previous assignment. No new pairing is allowed at this time.

Important++

Avoid cheating.