

CSE 259 - Logic in Computer Science

Fall 2024

Recitation-4

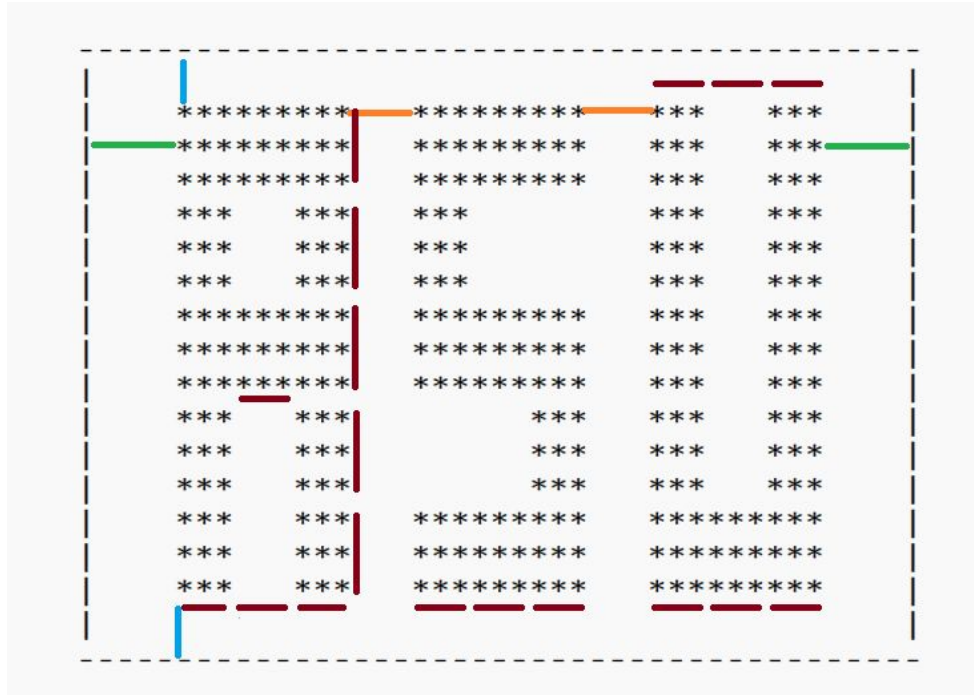
Project-1: Printing ASU Part 1

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Project-1

- Use the query ***asu(LeftRightMargin, BottomTopMargin, SpaceBetweenCharacters, FontSize)***
- The output should look like the following



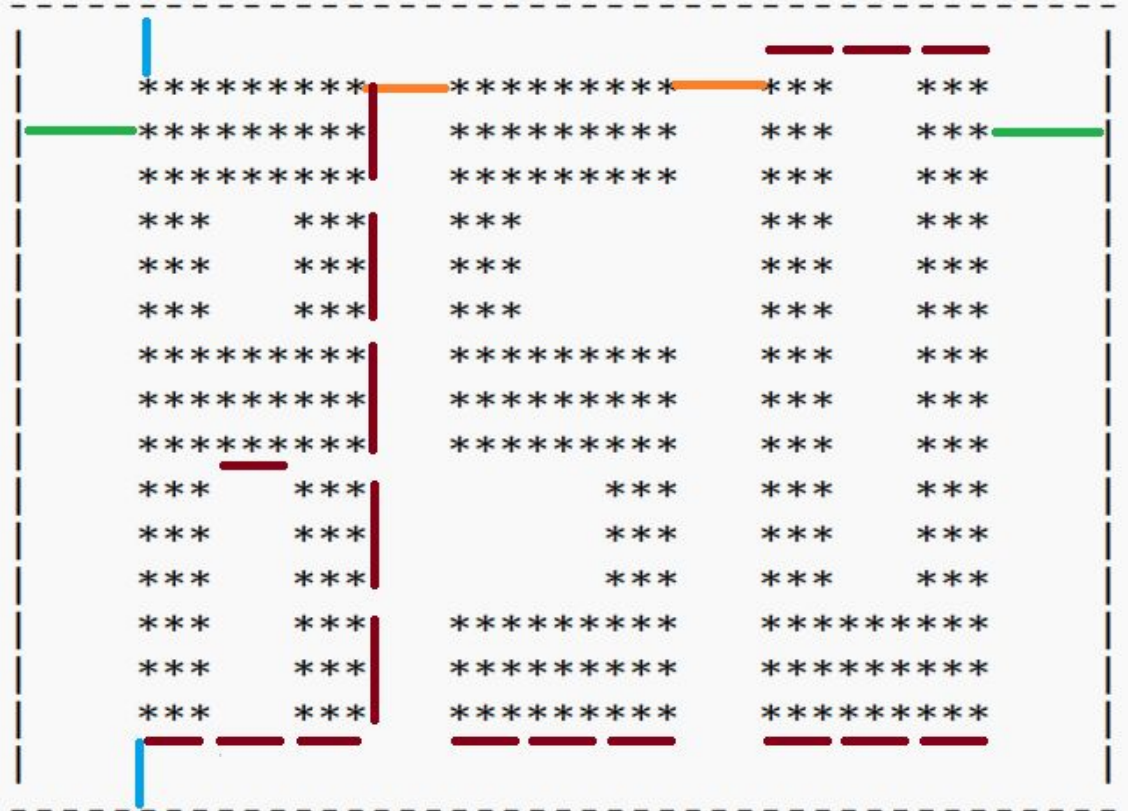
Project-1

LeftRightMargin = 4

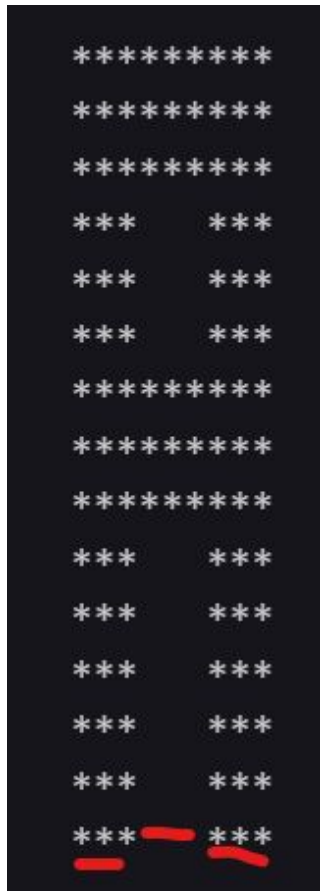
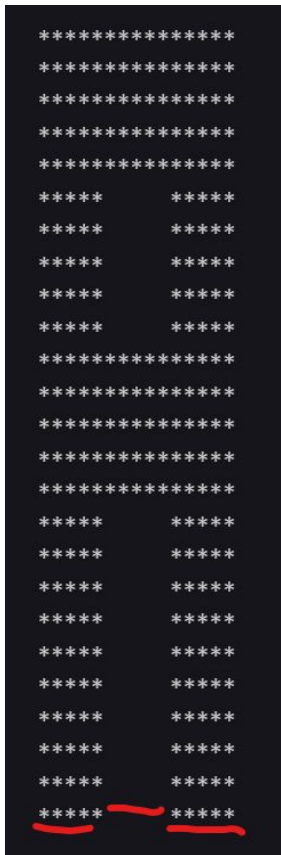
BottomTopMargin = 1

SpaceBetweenCharacters = 3

FontSize = 3



Understanding the segment and FontSize



- Each letter can be divided horizontally into 3 segments.
- Each segment will have FontSize number of characters
- Each letter can be divided vertically into 5 segments
- Each segment will have FontSize number of characters

Utility codes

```
drawSymbol(Symbol, 0).  
drawSymbol(Symbol, N) :- N > 0, write(Symbol), N1 is N - 1, drawSymbol(Symbol, N1).
```

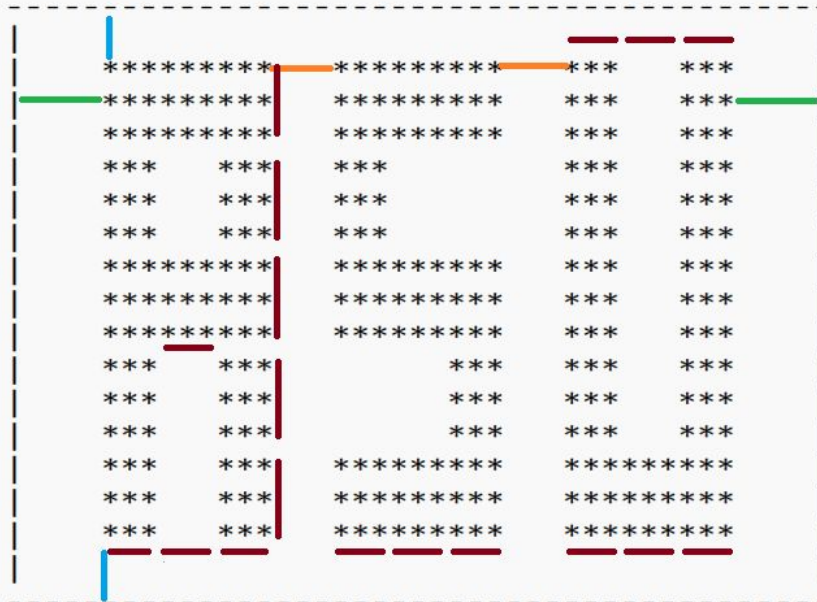
- If $N = 0$ then, nothing to print
- Else,
 - we check if $N > 0$
 - If true then print the character of our choice and move forward
 - We assign $N1 = N - 1$
 - Call the rule recursively with the new value of N

Drawing the rectangle - horizontal line

Total characters = (LeftRightMargin x 2) + (SpaceBetweenCharacters x 2) + **(3 x 3 x FontSize) + 2**

(3 x 3 x FontSize): 3 letters. Each character can be divided into 3 segments horizontally. Each segment has FontSize number of characters.

+2 is for the 2 vertical bars!



Drawing the rectangle - horizontal line

```
drawSymbol(Symbol, 0).  
drawSymbol(Symbol, N) :- N > 0, write(Symbol), N1 is N - 1, drawSymbol(Symbol, N1).  
  
drawHorizontalLine(Symbol, 0) :- nl.  
drawHorizontalLine(Symbol, N) :- drawSymbol(Symbol, N).
```

```
| ?- drawHorizontalLine(-, 10).
```

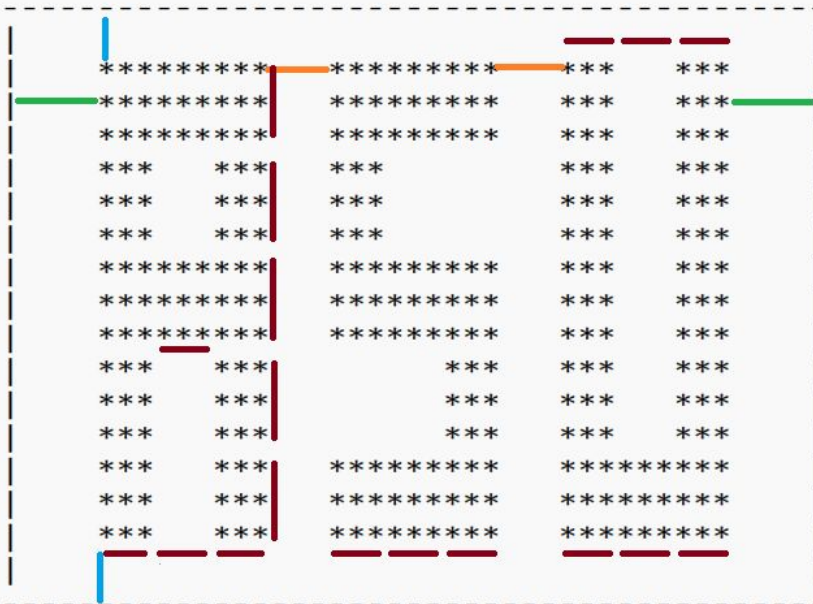
```
-----
```

```
true ?
```

```
yes
```

Drawing the rectangle - vertical line

Total characters = (BottomTopMargin x 2) + (5 * FontSize)



Drawing the rectangle - vertical line

```
drawVerticalLines(Symbol, 0, Width).  
drawVerticalLines(Symbol, Height, Width) :-  
    Height > 0,  
    write(Symbol),  
    drawSymbol(' ', Width - 2),  
    write(Symbol),  
    nl,  
    Height1 is Height - 1,  
    drawVerticalLines(Symbol, Height1, Width).
```

Drawing the rectangle - vertical line

```
| ?- drawVerticalLines('|', 10, 10).
```

```
|  
|  
|  
|  
|  
|  
|  
|  
|  
|  
|
```

```
true ?
```

```
yes
```

```
| ?-
```

Drawing the rectangle - combining everything

```
drawRectangle(LeftRightMargin, BottomTopMargin, SpaceBetweenCharacters, FontSize) :-  
    integer(LeftRightMargin), integer(BottomTopMargin), integer(SpaceBetweenCharacters), integer(FontSize),  
    Width is (LeftRightMargin * 2 + SpaceBetweenCharacters * 2 + FontSize * 3 * 3 + 2),  
    Height is (BottomTopMargin * 2 + FontSize * 5),  
    drawHorizontalLine('-', Width),  
    nl,  
    drawVerticalLines('|', Height, Width),  
    drawHorizontalLine('-', Width).
```

Drawing the rectangle - combining everything



The screenshot shows a GNU Prolog console window with a menu bar (File, Edit, Terminal, Prolog, Help) and a text area. The text area contains the following text:

```
yes  
| ?- drawRectangle(4, 1, 3, 3).  
  
true ?
```

A dashed rectangle is drawn in the text area, representing the output of the `drawRectangle(4, 1, 3, 3).` command. The rectangle has a width of 4 and a height of 3, starting at x=1 and y=1. The text area also has a vertical scrollbar on the right side.