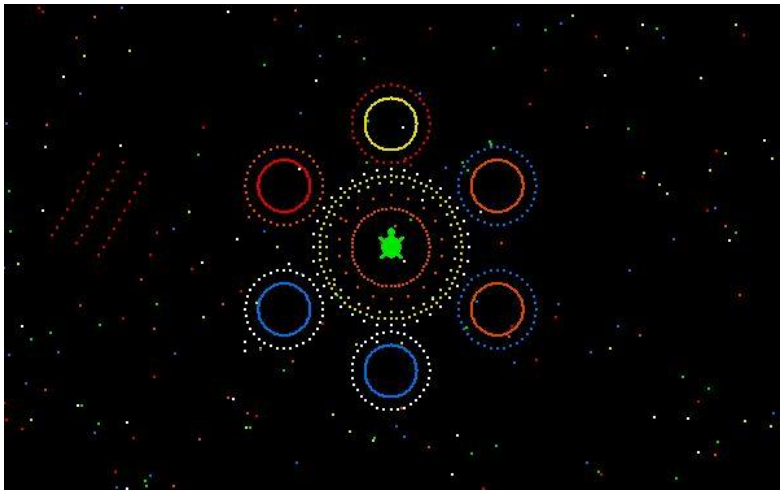
Special Topic 1: Logo PL

CMSC 124, 1st Semester, AY 2009-10



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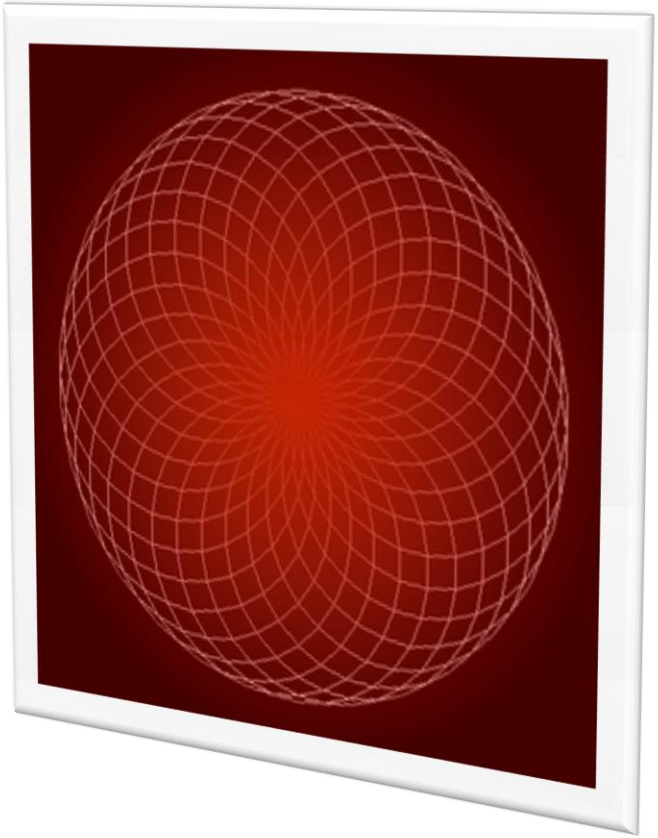
Background

Logo

- Not a symbol or design. ☺
- Based on Lisp.
- A functional programming language.
- Created in 1967 for educational use.
- Can be used to teach most computer science concepts.
- Uses prefix notation.
- Not case-sensitive.



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The All-Important Turtle

The Turtle

- Late 1960's
- It can be given movement and drawing instructions.
- It is used to programmatically produce line graphics.
- Turtle graphics, Turtle geometry
- Some Syntax:

  FORWARD <no of steps>
  LEFT <degree>
  RIGHT <degree>

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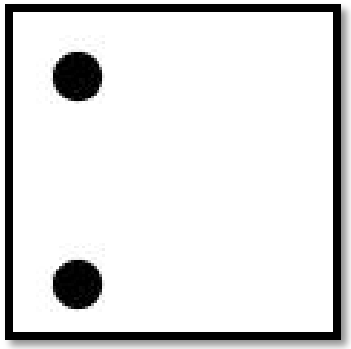
Two Important Symbols

The Colon

- "the contents of"
- an extremely useful symbol that keeps reminding students that a variable is really some 'place' in memory.



The Quote

- "the word is evaluated as itself" or
  "its value after evaluation is the same as it was before"

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Two Important Symbols: Example

Translate into Logo:

```
x = y + 3
```

```
MAKE "x SUM :y 3
MAKE "x SUM :y "3
```

```
grade = 1
print grade
```

```
MAKE "grade 1
PRINT :grade
```

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Operations

```
SUM <param1> <param2>
DIFFERENCE <param1> <param2>
PRODUCT <param1> <param2>
QUOTIENT <param1> <param2>
```

Eg. Translate into Logo:

```
x/2
```

```
QUOTIENT :x 2
```

What is the output?

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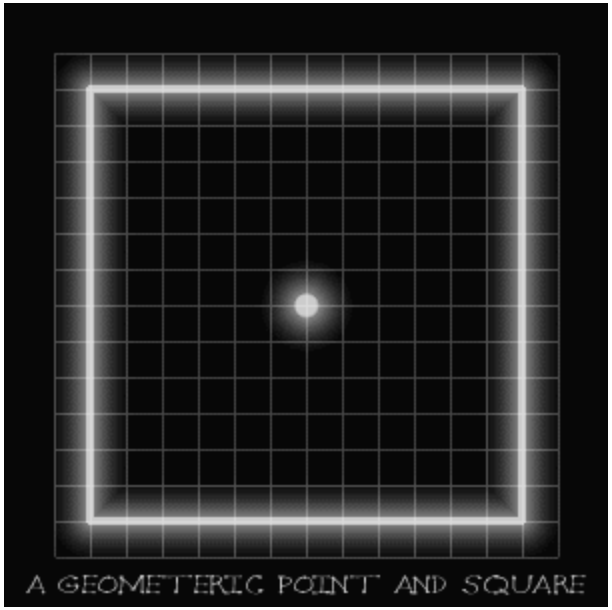
Basic Loops

```
REPEAT <no. of times> [ commands ]
```

Eg. What is the syntax in drawing a square?
(Length is 100 steps)

```
REPEAT 4 [FORWARD 100 LEFT 90]
```



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Functions

```
TO <function name> <optional formal param>
<code>
....
<code>
END
```

Eg.

Define DRAW_SQUARE function.

Define HELLO_WORLD function, printing n times.

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QUIZ

Define BACKWARD function.
The function has STEP (number of steps) as its parameter.

Possible short answers are:

```
TO BACKWARD :STEP
FORWARD DIFFERENCE 0 :STEP
END
```

```
TO BACKWARD :STEP
FORWARD -:STEP
END
```

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Evaluation Criteria

1. Readability
2. Writability
3. Realiability
4. Cost
5. User Friendliness