Introduction to Java

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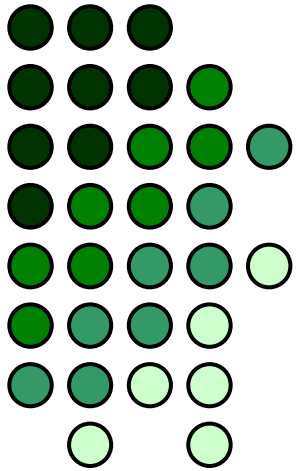
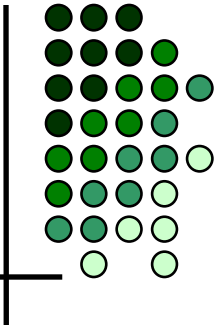
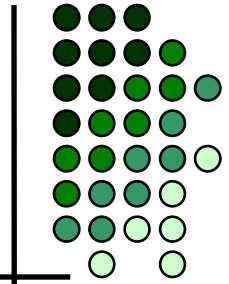


Programming Paradigms



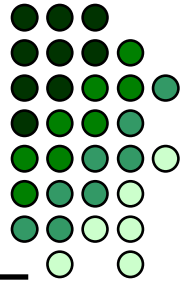
- Provides the view that a programmer has of the execution of a program
  - Procedural programming
  - Modular programming
  - Object oriented programming (OOP)
  - Functional programming
  - Logic Programming

Procedural Programming



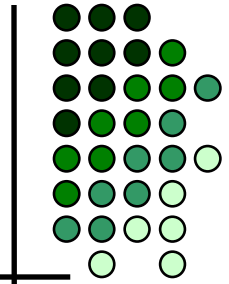
- Also referred to as imperative programming
- Specifying steps the program must take to reach the desired state
- Makes use of procedure calls where each procedure may be called at any time

Procedural Programming



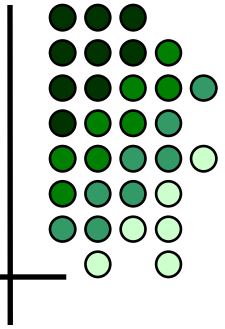
```
main()
{
  float fSummation=0;
   float fAve=0;
  int nCtr=0;
  for(nCtr=1;nCtr<=100;nCtr++)
      fSummation+=nCtr;
  fAve=fSummation/(nCtr-1);
}
```

Modular Programming



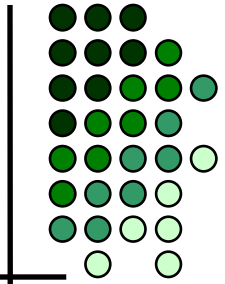
- Makes use of modules
- Modules provide sets of operations that can be used as components in larger systems
- Implementation of the module is already abstracted

Modular Programming



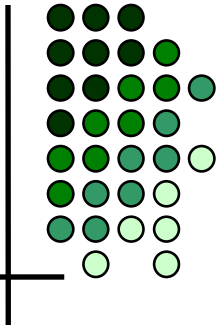
```
#include <stdio.h>
#include <math.h>
main()
{
    double a = 25; double b = 15;
    double quad1, quad2;
    quad1=-b+sqrt(pow(b,2)-4*a*c)/2*a;
    quad2=-b-sqrt(pow(b,2)-4*a*c)/2*a;
    printf("X is: %f or %f",quad1, quad2);
}
```

Object Oriented Programming



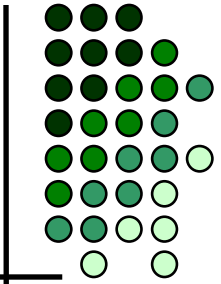
- Makes use of objects to design applications
- Solutions are done in terms of the creation and interaction of objects
- Retains the concept of modular and procedural programming

Object Oriented Programming



```
public class Driver
{
    public static void main(String[ ] args)
    {
        Cylinder cyl=new Cylinder(4,8);
        Circle circ=cyl.getBase();
        double volume=cyl.getHeight()*circ.getArea();
        System.out.println("Volume is: "+volume);
    }
}
```

History of Java



- started as a project called "Oak"
  - The name came from an oak tree that stood outside the Sun Microsystems office
- developed by James Gosling’s team in June 1991
- goals were to implement a virtual machine
- language must be in a C/C++ style of notation
- promised "Write Once, Run Anywhere" (WORA), providing no-cost runtimes on popular platforms

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