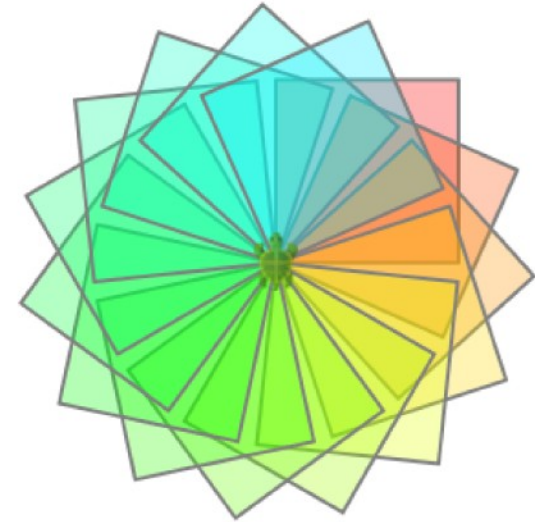




The Learning Environment Kojo

Using a highly advanced language
to teach programming to absolute beginners.





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What is Kojo

- Graphical Learning Environment
- Geared towards children and other beginners
- Use programming to explore Arts, Math, Music, Animations, Games
- Turtle Graphics for immediate visual feedback
- Near-professional IDE for text-based programming
- Powerful language Scala:
 - Easy to begin
 - No upper limit
- Multi-language support in UI and **API**





Demonstration of Kojo

- `forward`; `right`; `parameterize(100)`, to square.
- `loop`, to pentagon, to hexagon, speedup
- Avoid redundancies
- Further to 11-gon. Discuss effect.
- `setFillColor`, `setPenColor`, `setPenThickness`
- Define a reusable square.
- Prepared code examples
 - Bunte Quadrate = Square Pattern
 - Multiple Turtles → Rangoli Art
 - Fractals → Tree: Study recursion. Enter random.





Where to find Kojo

- Homepage <http://www.kogics.net/kojo>
- Documentation <http://www.kogics.net/kojo-ebooks>
- Runs on JVM as webstart or desktop application.
Download installers for Windows, Linux, Mac
<http://www.kogics.net/kojo-download>





Who created Kojo

Lalit Pant

- Born, grown up in India
- ~ 16 years developer in USA, Europe, India
- Returned to Dehradun, India with his family
- Teaching Math and CS in a school for underprivileged girls
- See biography at <http://kogics.net/about>
- See interview for details



<https://www.thoughtworks.com/insights/blog/meet-lalit-pant-scala-contributor-and-author-kojo>





Who uses Kojo

- Lalit in his school, quite a lot in India
- Swedish professor Björn Regnell began internationalization.
- Introduced Kojo for short-time visitors at Vattenhall Science Center, Lund, Sweden.
<http://www.lth.se/programmera/>
- Introduced successfully in swedish school system.
- Currently Kojo is localized into 9 languages:
I did German and Esperanto.
- I used it for Long Night of Sciences, 1st semester CS.



Dive into Kojo sources

- Source code, how to contribute
https://bitbucket.org/lalit_pant/kojo-g
- German API defined in
`scala/net/kogics/kojo/lite/i18n/de/Init.scala`
- Internal Scala code navigatable from there
- German texts defined in
`resources/net/kogics/kojo/lite/i18n/Bundle_de.properties`





Why Scala is so well-suited for Kojo

- All Unicode letters allowed in identifiers ⇒ API localizable. (Language switching difficult up to 15 years)
- Default arguments, flexible syntax:
`right(90); right(); right`
- Type inference means typing economy
- Simplest loop `repeat(n) {block}` definable.
- Open system, call Java
- No IDE lock-in





Summary

- Real text-based programming made simple
- Near-professional IDE
- Immediate visual feedback (like others)
- Real-world language, no upper limit.





Thank You

