An “enjoyable” introduction to Programming

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Analogy for learning to program: Learning to ride bicycle

• Difficulties for beginners:
  – Learning to balance & go forward together

• Difficulties for experienced folks:
  – None.
Solution for beginners

• Training wheels
• Helmet

• Makes learning enjoyable and safe!

• Similar difficulties are there while learning to program in a computer.
Learning to program: Difficulties for beginners

1. Syntax errors
   - struggle for hours to fix syntax errors
   - Loose confidence
   - Frustrating experience
   - Run away & never come back if possible!

2. Logic errors
   Not a serious issue.
Difficulties for experienced programmers

Logic errors
Continuous learning
Recommendation

• C/C++/Java in introductory programming course has been a disaster for lots of learners!
• It is better to use intermediate steps like Alice and KhanAcademy.
• Following is a meaningful approach:
  Alice → KhanAcademy JavaScript → C/C++/Java
Recommendation ...

• Visual Programming Tools like Alice use drag-and-drop programming and enable us to master programming concepts.

• Programs are always ready to run since there are no syntax errors. In other words, they enable us to focus on the logic first & build confidence.
# Free Visual Programming Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Provider</th>
<th>Web-site</th>
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<tbody>
<tr>
<td>Alice 2.3</td>
<td>Carnegie Mellon University</td>
<td><a href="http://www.alice.org">www.alice.org</a></td>
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<tr>
<td>Scratch</td>
<td>MIT</td>
<td>scratch.mit.edu</td>
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<tr>
<td>Snap!</td>
<td>UCBerkeley</td>
<td>byob.berkeley.edu</td>
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<tr>
<td>Lego MindStorm</td>
<td>Lego</td>
<td>mindstorms.lego.com</td>
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<tr>
<td>Several more...</td>
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A few bit advanced tools

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<tr>
<td>Alice 3.1</td>
<td>Carnegie Mellon University</td>
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<tr>
<td>JavaScript &amp; Processing.js</td>
<td>Khan Academy CS platform</td>
<td><a href="http://www.khanacademy.org/cs">www.khanacademy.org/cs</a></td>
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<tr>
<td>Racket</td>
<td>UCBerkeley</td>
<td>wescheme.org</td>
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