Intelligent Code Completion

```csharp
public class MyDialog : Dialog
{
    public override void Create()
    {
        var text = new Text();
        text..
    }
}
```
public class MyWizardPage extends WizardPage {

    @Override
    public void createControl(Composite arg0) {
        Button b = new Button(arg0, INFORMATION);
        b.addSelectionListener(Helper.createSelectionListener());
        b.setLayoutData(Helper.createLayoutData());
    }
}

ctx: WizardPage.createControl(Composite)
call: Button.<init>(...)
call: addSelectionListener(...)
call: setLayoutData(...)
Best-Matching Neighbor (BMN)

<table>
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<th>Method Contexts</th>
<th>Receiver Callsites</th>
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<tr>
<td>Dialog. createDialogArea</td>
<td>ModifyListener. modifyText</td>
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<tr>
<td>Usage 1</td>
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Learning A Model From Examples

BMN Table

More features

More examples
Software Development Tools

Source Code → Mining → Model → Uses → Recommender

Query → Proposal

Developer
Where to Find Source-Code?

GitHub

- A lot(!) of source code
- Diverse Range of Applications
- Hard to resolve dependencies
- Harder to get projects to build

→ Big challenge to directly work with data from GitHub

KaVE

- Maintained Dataset
- No Compilation Required
- Resolved Typing Information
- Relatively Small Dataset

→ Easier to get started; allows you to focus on the actual recommender, rather than the project setup.
Evaluation?
Typical (Artificial) Evaluation

Incomplete Example

Expectation

Query

Recommender

Proposals
Capture Interactions to Create Realistic Benchmark

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        var text = new Text();
        text.
    }
}
```

Syntax Tree
+ Completion Marker
Selection
Benchmark for Method-Call Recommendation Systems

Static Analyses & Machine Learning → Recommender Systems → Dataset of Repository Data

Dataset of Interaction Data → Requesting Proposals → ASE Project

Mining

Evaluation