KUBERNETES COMMUNITY DAYS BEIJING 2025

即刻受益：从自动化到智能化，代码扫描工具升级实践

Upgrade Bot to AI Agent,

benefit Open Source Communities

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Part 01

灵感

REACT : SYNERGIZING REASONING AND ACTING IN LANGUAGE MODELS

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- 通过可靠的第三方数据从而提高LLM对于问题的理解，提高正确率。论文中使用了Wiki作为第三方外部数据源。

	Type	Definition	ReAct	CoT
Success	True positive	Correct reasoning trace and facts	94%	86%
	False positive	Hallucinated reasoning trace or facts	6%	14%
Failure	Reasoning error	Wrong reasoning trace (including failing to recover from repetitive steps)	47%	16%
	Search result error	Search return empty or does not contain useful information	23%	-
	Hallucination	Hallucinated reasoning trace or facts	0%	56%
	Label ambiguity	Right prediction but did not match the label precisely	29%	28%

Table 2: Types of success and failure modes of ReAct and CoT on HotpotQA, as well as their percentages in randomly selected examples studied by human.

Part 02

设计，实现

在pipeline中，我们去哪里找寻事实?

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场景	工具	目的	内容	措施
单元测试	JUnit，Go test	验证代码功能健壮性	测试通过率，代码覆盖率	修复测试用例，补全测试覆盖率
静态代码分析	ESLint	检查代码风格，潜在缺陷	代码异味，潜在问题	重构代码，安全提升
依赖扫描	Snyk	检测第三方已知漏洞	CVE编号，风险	升级代码版本，采取安全措施
安全扫描	OWASP	检测代码漏洞	漏洞类型，风险等级	修复漏洞代码，提高软件安全

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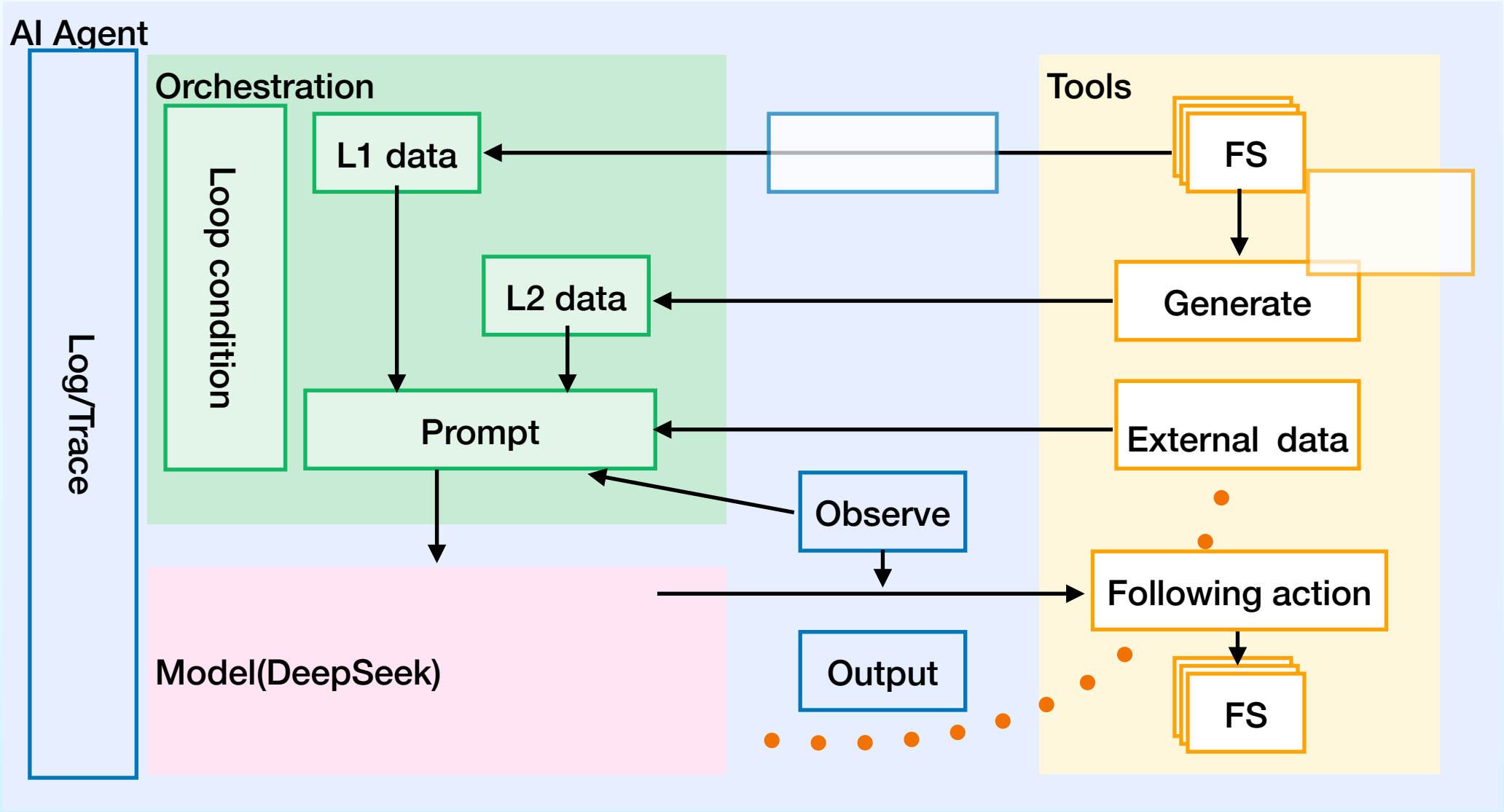

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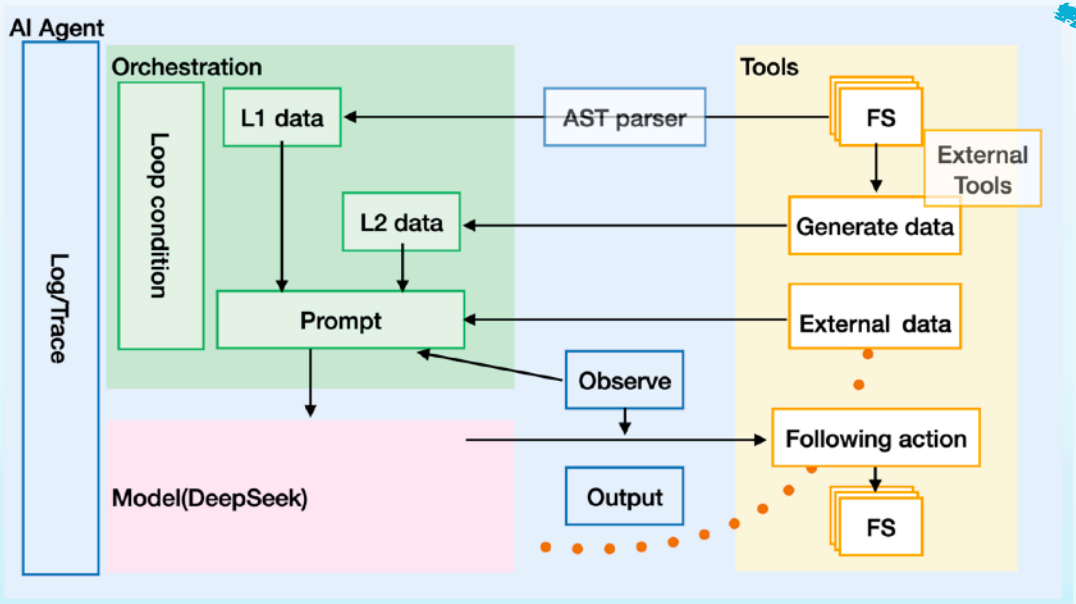


```yaml
        repository: SamYuan1990/kubeedge
    - uses: actions/setup-go@v5
    - name: generate CVE.json
      run: |
        curl -sSfL https://raw.githubusercontent.com/anchore/syft/main/install.sh | sh -s -- -b ./
        go install github.com/devops-kung-fu/bomber@latest
        ./syft scan kubeedge/${{matrix.IMAGE}}:v1.20.0 -o cyclonedx-json -vv  > sbom.json
        cat sbom.json
        bomber scan ./sbom.json --output=json --debug > cve.json
        cat cve.json
    - name: use this action to generate suggestion for deployment settings
      id: Lint_with_LLM
      uses: SamYuan1990/OpenAI_CodeAgent-action@main
      with:
        baseURL: https://api.deepseek.com
        apiKey: ${{ secrets.API_KEY }}
        model: deepseek-chat
        dirpath: '/workdir'
        deploymentfile: /workdir/${{ matrix.PATH }}
        runType: CVE2Deployment
    - name: output check
      shell: bash
      run: |
        echo '${{ steps.Lint_with_LLM.outputs.avg_prompt_precent }}'
        echo '${{ steps.Lint_with_LLM.outputs.avg_content_precent }}'
        echo '${{ steps.Lint_with_LLM.outputs.avg_time_usage }}'
        echo '${{ steps.Lint_with_LLM.outputs.avg_inputToken }}'
        echo '${{ steps.Lint_with_LLM.outputs.avg_outputToken }}'

    - name: Create new issue
      uses: imjohnbo/issue-bot@v3
      if: ${{ inputs.dryrun == false }}
      with:
        title: CVE cross check with deployment on container image ${{matrix.IMAGE}}
        body: |-
          :wave: Hi maintainers, here is LLM's deployment suggested according to your CVSS scan result.
          ${{ steps.Lint_with_LLM.outputs.LLMresponse }}
```

PR push back as Bot

Part 03

效果，指标

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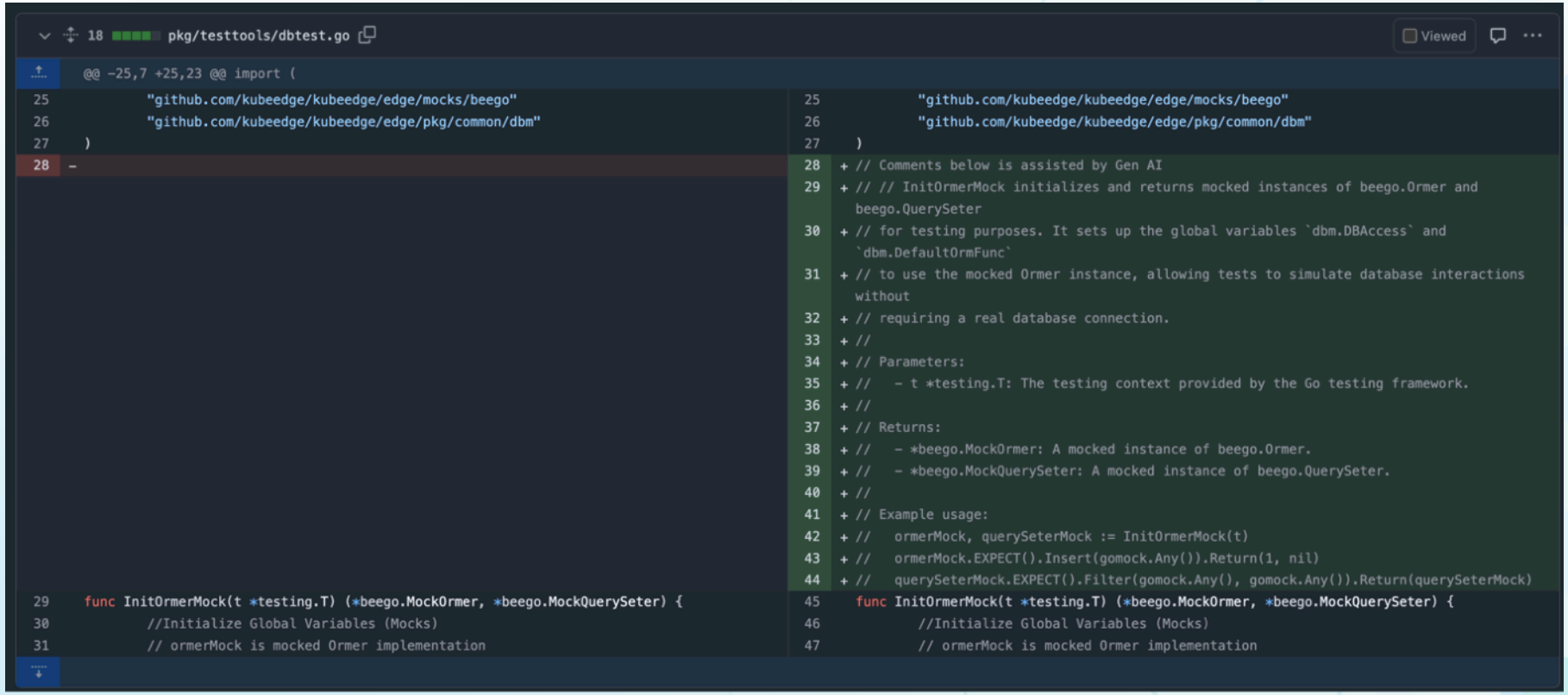

18 pkg/testtools/dbtest.go

Viewed

```
@@ -25,7 +25,23 @@ import (
        "github.com/kubeedge/kubeedge/edge/mocks/beego"
        "github.com/kubeedge/kubeedge/edge/pkg/common/dbm"
)
-
+// Comments below is assisted by Gen AI
+// // InitOrmerMock initializes and returns mocked instances of beego.Ormer and beego.QuerySeter
+// for testing purposes. It sets up the global variables `dbm.DBAccess` and `dbm.DefaultOrmFunc`
+// to use the mocked Ormer instance, allowing tests to simulate database interactions without
+// requiring a real database connection.
+//
+// Parameters:
+//   - t *testing.T: The testing context provided by the Go testing framework.
+//
+// Returns:
+//   - *beego.MockOrmer: A mocked instance of beego.Ormer.
+//   - *beego.MockQuerySeter: A mocked instance of beego.QuerySeter.
+//
+// Example usage:
+//   ormerMock, querySeterMock := InitOrmerMock(t)
+//   ormerMock.EXPECT().Insert(gomock.Any()).Return(1, nil)
+//   querySeterMock.EXPECT().Filter(gomock.Any(), gomock.Any()).Return(querySeterMock)
 func InitOrmerMock(t *testing.T) (*beego.MockOrmer, *beego.MockQuerySeter) {
        //Initialize Global Variables (Mocks)
        // ormerMock is mocked Ormer implementation
```

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2. Use Non-Root User

- Run the container as a non-root user to minimize the impact of potential exploits.
- Add the following to your container spec:

```
securityContext:
 runAsNonRoot: true
 runAsUser: 1000
 runAsGroup: 2000
```

3. Enable Read-Only Root Filesystem - Since the container does not need to write to the filesystem, set the root filesystem to read-only. - Add the following to your container spec:

```
securityContext:        readOnlyRootFilesystem: true
```

4. Drop Unnecessary Capabilities

- Drop all Linux capabilities that are not required by the container.
- Add the following to your container spec:

```
securityContext:
  capabilities:
    drop:
      - ALL
```

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Explanation:

- **Original Code:**

```
const std::string& AdaptiveMaxConcurrency::CONSTANT() {
    static std::string* s = new std::string("constant");
    return *s;
}
```

  - The original code uses a `static std::string*` which leads to a memory leak since the allocated memory is never freed.

- **Fixed Code:**

```
const std::string& AdaptiveMaxConcurrency::CONSTANT() {
    static std::string s("constant");
    return s;
}
```

  - The fixed code uses a `static std::string` instead of a pointer, which ensures that the memory is managed automatically by the C++ runtime, eliminating the risk of memory leaks and simplifying the code.

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指标	解释	例子
提示词占比	提示词占任务的比重	请帮我为这个函数写一段描述, func add(…
内容占比	具体内容占任务的比重	请帮我为这个函数写一段描述, func add(…
输出Token数量	length(output)	*// func add is a sum function which…*
运行时长	大模型执行单次任务的时间	

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指标\功能	文档生成	部署建议	代码脆弱扫描
提示词占比	16.029%	5.685714285714 29%	54.24%
内容占比	83.622%	93.71428571428 57%	45.65%
输出Token数量	430.3	1207.7142857142 9	742
运行时长(s)	26.022	61.631714285714 3	43.89

Thanks

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