Propuesta de solución

Caso Práctico 1 – Apartado B

Asignatura	Datos del alumno	Fecha
Experto Universitario en DevOps & Cloud	Apellidos: Leon Granda	
	Nombre: Giovanna Victoria	

URL de repositorio solución de GitHub: https://github.com/GiovannaLeon/helloworld.git

Reto 1 – Creación pipeline CI

En este reto se solicitan 4 entregables:

- URL al repositorio creado por el alumno, a partir del código fuente base de este CP1, que albergue tanto el código fuente como el Jenkinsfile. (jenkinsfile:

https://github.com/GiovannaLeon/helloworld/blob/master/CP2.1.1/cp2.1.1.txt

```
pipeline {
  agent any

  environment {
    PYTHON_PATH = "C:\\Users\\amaro\\AppData\\Local\\Programs\\Python\\Python313\\python.exe"
    PYTHON_PATH_SCRIPTS = "C:\\Users\\amaro\\AppData\\Local\\Programs\\Python\\Python313\\Scripts"

  }

  stages {
    stage('Get Code') {
      steps {
        git 'https://github.com/GiovannaLeon/helloworld.git'
        bat "dir"
        echo WORKSPACE
      }
    }

    // Etapa de Pruebas Unitarias
    stage('Unit') {
      steps {
        catchError(buildResult: 'UNSTABLE', stageResult: 'FAILURE') {
          bat '''
            SET PYTHONPATH=%WORKSPACE%
            %PYTHON_PATH_SCRIPTS%\\coverage.exe run --branch --source=app --omit=app\\__init__.py,app\\api.py -m pytest -
-junitxml=result-unit.xml test\\unit



          '''
          sleep(5) // Asegúrate de que los resultados estén listos
          junit 'result-unit.xml' // Reporte de las pruebas unitarias
        }
      }
    }

    // Etapa de Cobertura de Pruebas (Reutilizando los resultados de Unit)
    stage('Coverage') {
      steps {
        bat '''
          %PYTHON_PATH_SCRIPTS%\\coverage.exe xml
        '''

        catchError(buildResult: 'UNSTABLE', stageResult: 'FAILURE') {
          cobertura coberturaReportFile: '**/coverage.xml', conditionalCoverageTargets: '100,0,80', lineCoverageTargets:
'100,0,90'
        }
      }
    }


    // Etapa de Análisis Estático (Flake8)
    stage('Static') {
      steps {
        bat '''
          %PYTHON_PATH_SCRIPTS%\\flake8.exe --exit-zero --format=pylint --exit-zero app >flake8.out
        '''
        // Umbrales para Flake8
        recordIssues tools: [flake8(name: 'Flake8', pattern: '**/flake8.out')],
                              qualityGates: [
                                  [threshold: 8, type: 'TOTAL', unstable: true],  // 8 o más hallazgos -> Unstable
                                  [threshold: 10, type: 'TOTAL', unstable: false, healthy: false]  // 10 o más hallazgos -> Unhealthy
                              ]
            }
        }

        // Etapa de Análisis de Seguridad (Bandit)
        stage('Security') {
            steps {
                bat '''
                    %PYTHON_PATH_SCRIPTS%\\bandit.exe   --exit-zero   -r   .   -f   custom   -o   bandit.out   --msg-template   "{abspath}:{line}:
[{test_id}] {msg}"
                '''
                catchError(buildResult: 'SUCCESS', stageResult: 'UNSTABLE') {
                    // Usamos el patrón relativo para buscar 'bandit.out' y aplicar los Quality Gates
                    recordIssues tools: [pyLint(name: 'Bandit', pattern: '**/bandit.out')],
                                 qualityGates: [
                                     [threshold: 2, type: 'TOTAL', unstable: true],   // 2 o más hallazgos -> Unstable
                                     [threshold: 4, type: 'TOTAL', unstable: false, healthy: false]  // 4 o más hallazgos -> Unhealthy
                                 ]
                }
            }
        }

       // Etapa de Pruebas de Rendimiento (JMeter)
        stage('Performance') {
            steps {
                 bat '''
                    SET FLASK_APP=app\\api.py
                    start /B %PYTHON_PATH% -m flask run --host=0.0.0.0 --port=5000
                    timeout /t 10 /nobreak
                    rem Espera 10 segundos para asegurarse de que Flask esté listo antes de correr las pruebas
                    C:\\Users\\amaro\\Downloads\\apache-jmeter-5.6.3\\apache-jmeter-5.6.3\\bin\\jmeter -n -t test\\jmeter\\flask.jmx -f -
l flask.jtl
                '''

                script {

                    // Leemos el archivo coverage.xml generado
                   // def coverageFile = readFile('../coverage.xml')

                 try {
                        def coverageFile = readFile('coverage.xml')
                        echo "Archivo coverage.xml leído correctamente."

                    // Expresión regular para extraer la cobertura de líneas
                    def lineCoverageMatch = (coverageFile =~ /<counter type="line" covered="(\d+)"/)
                    def lineCoverage = lineCoverageMatch ? lineCoverageMatch[0][1].toInteger() : 0
                    echo "Expresión 1."

                    // Expresión regular para extraer la cobertura de ramas
                    def branchCoverageMatch = (coverageFile =~ /<counter type="branch" covered="(\d+)" /)
                    def branchCoverage = branchCoverageMatch ? branchCoverageMatch[0][1].toInteger() : 0
                    echo "Expresión 2."

                echo "Valor de lineCoverageMatch: ${lineCoverageMatch}"

                echo "Valor de lineCoverage: ${lineCoverage}"


                echo "Valor de branchCoverageMatch: ${branchCoverageMatch}"

                echo "Valor de branchCoverage: ${branchCoverage}"

                    // Verificar cobertura por líneas
                    //if (lineCoverage < 85) {
                     //   currentBuild.result = 'FAILURE'
                    //} else if (lineCoverage < 95) {
                     //   currentBuild.result = 'UNSTABLE'
                    //} else {
                    //    currentBuild.result = 'SUCCESS'
                    //}
```

```
                                        //echo "Expresión 3."

                                        // Verificar cobertura por ramas/condiciones
                                        //if (branchCoverage < 80) {
                                          //  currentBuild.result = 'FAILURE'
                                        //} else if (branchCoverage < 90) {
                                          //  currentBuild.result = 'UNSTABLE'
                                        //} else {
                                          //  currentBuild.result = 'SUCCESS'
                                        //}
                                        //echo "Expresión 4."



                                        } catch (Exception e) {
                                            echo "Error al leer coverage.xml: ${e.message}"
                                        }




                                        // Después de la ejecución de las pruebas de rendimiento y la cobertura, procesamos el reporte
                                        catchError(buildResult: 'SUCCESS', stageResult: 'UNSTABLE') {
                                            // Ejecutar el reporte de rendimiento
                                            perfReport sourceDataFiles: '**/flask.jtl'
                                        }
                                    }
                                }
                            }
                        }
}
```

Log de la ejecución del pipeline.

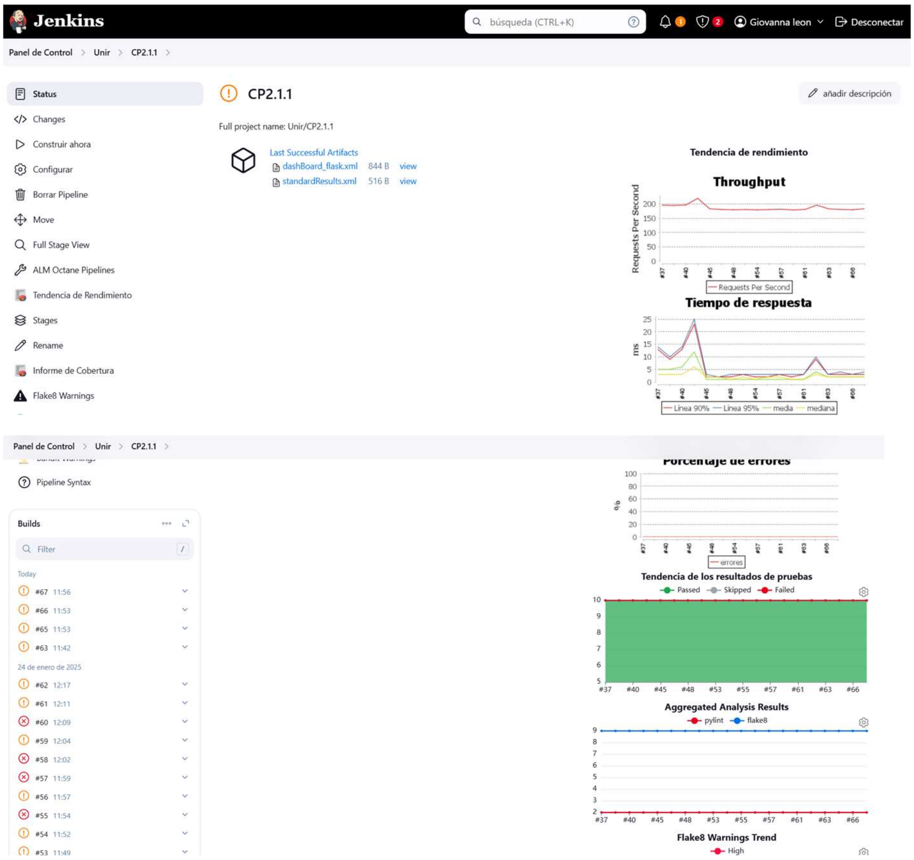
```
Lanzada por el usuario Giovanna leon


[Pipeline] Start of Pipeline
[Pipeline] node
Running on agent2
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1
[Pipeline] {
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Get Code)
[Pipeline] git
The recommended git tool is: NONE
No credentials specified
Fetching changes from the remote Git repository
Checking out Revision a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 (refs/remotes/origin/master)
Commit message: "Add files via upload"
 > git.exe rev-parse --resolve-git-dir C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1\.git # timeout=10
 > git.exe config remote.origin.url https://github.com/GiovannaLeon/helloworld.git # timeout=10
Fetching upstream changes from https://github.com/GiovannaLeon/helloworld.git
 > git.exe --version # timeout=10
 > git --version # 'git version 2.47.1.windows.1'
 > git.exe fetch --tags --force --progress -- https://github.com/GiovannaLeon/helloworld.git +refs/heads/*:refs/remotes/origin/* # timeout=10
 > git.exe rev-parse "refs/remotes/origin/master^{commit}" # timeout=10
 > git.exe config core.sparsecheckout # timeout=10
 > git.exe checkout -f a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 # timeout=10
 > git.exe branch -a -v --no-abbrev # timeout=10
 > git.exe branch -D master # timeout=10
 > git.exe checkout -b master a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 # timeout=10
 > git.exe rev-list --no-walk a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 # timeout=10
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>dir
 El volumen de la unidad C es Windows
 El n£mero de serie del volumen es: 6475-04AA

 Directorio de C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1
```

```
25/01/2025  11:54    <DIR>          .
24/01/2025  01:01    <DIR>          ..
25/01/2025  11:54            53.248 .coverage
24/01/2025  00:40                40 .gitignore
24/01/2025  00:40    <DIR>          .pytest_cache
24/01/2025  00:40    <DIR>          app
25/01/2025  11:54               426 bandit.out
25/01/2025  11:54             2.261 coverage.xml
25/01/2025  11:42    <DIR>          CP2.1.1
25/01/2025  11:54               500 flake8.out
25/01/2025  11:54            19.938 flask.jtl
24/01/2025  00:40    <DIR>          jenkinsFile_1
24/01/2025  00:40    <DIR>          jenkinsFile_2
24/01/2025  00:40    <DIR>          JenkinsFile_3
24/01/2025  00:40    <DIR>          jenkinsfile_4
25/01/2025  11:54            10.493 jmeter.log
24/01/2025  00:40               175 pytest.ini
24/01/2025  00:40               418 README.md
25/01/2025  11:54             1.401 result-unit.xml
24/01/2025  00:40    <DIR>          test
              10 archivos         88.900 bytes
              10 dirs  560.666.284.032 bytes libres
[Pipeline] echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Unit)
[Pipeline] catchError
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>SET
PYTHONPATH=C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>C:\Users\amaro\AppData\Local\Programs\Python\Pytho
n313\Scripts\coverage.exe run --branch --source=app --omit=app\__init__.py,app\api.py -m pytest  --junitxml=result-unit.xml test\unit
============================= test session starts =============================
platform win32 -- Python 3.13.0, pytest-8.3.4, pluggy-1.5.0
rootdir: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1
configfile: pytest.ini
collected 10 items

test\unit\calc_test.py ........                                          [ 80%]
test\unit\util_test.py ..                                                [100%]

- generated xml file: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1\result-unit.xml -
============================= 10 passed in 0.14s ==============================
[Pipeline] sleep
Sleeping for 5 Seg
[Pipeline] junit
Grabando resultados de tests
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Coverage)
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>C:\Users\amaro\AppData\Local\Programs\Python\Pytho
n313\Scripts\coverage.exe xml
Wrote XML report to coverage.xml
[Pipeline] catchError
[Pipeline] {
[Pipeline] cobertura
[Cobertura] Publishing Cobertura coverage report...

[Cobertura] Publishing Cobertura coverage results...

[Cobertura] Cobertura coverage report found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Static)
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>C:\Users\amaro\AppData\Local\Programs\Python\Pytho
n313\Scripts\flake8.exe --exit-zero --format=pylint --exit-zero app  1>flake8.out
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Flake8] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1' that match the pattern
'**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent2' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\CP2.1.1\builds\67\files-with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1' that match the pattern
'**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent2' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\CP2.1.1\builds\67\files-with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Reference build recorder is not configured
[Flake8] No valid reference build found
[Flake8] All reported issues will be considered outstanding
[Flake8] Evaluating quality gates
[Flake8] -> Some quality gates have been missed: overall result is UNSTABLE
[Flake8] -> Details for each quality gate:
[Flake8]    - [Total (any severity)]: ≪Inestable≫ - (Actual value: 9, Quality gate: 8,00)
[Flake8]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 9, Quality gate: 10,00)
[Flake8] Health report is disabled - skipping
[Flake8] Created analysis result for 9 issues (found 0 new issues, fixed 0 issues)
[Flake8] Attaching ResultAction with ID 'flake8' to build 'Unir/CP2.1.1 #67'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
```

```
[Pipeline] { (Security)
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>C:\Users\amaro\AppData\Local\Programs\Python\Python313\Scripts\bandit.exe --exit-zero -r . -f custom -o bandit.out --msg-template "{abspath}:{line}: [{test_id}] {msg}"
[main]      INFO      profile include tests: None
[main]      INFO      profile exclude tests: None
[main]      INFO      cli include tests: None
[main]      INFO      cli exclude tests: None
[main]      INFO      running on Python 3.13.0
[custom]    INFO      Result written to file: bandit.out
[Pipeline] catchError
[Pipeline] {
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Bandit] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1' that match the pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Successfully parsed file C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1\bandit.out
[Bandit] -> found 2 issues (skipped 0 duplicates)
[Bandit] Successfully processed file 'bandit.out'
[Bandit] Post processing issues on 'agent2' with source code encoding 'windows-1252'
[Bandit] Creating SCM blamer to obtain author and commit information for affected files
[Bandit] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Bandit] Resolving file names for all issues in workspace 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1'
[Bandit] -> resolved paths in source directory (1 found, 0 not found)
[Bandit] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Bandit] -> resolved module names for 2 issues
[Bandit] Resolving package names (or namespaces) by parsing the affected files
[Bandit] -> resolved package names of 1 affected files
[Bandit] No filter has been set, publishing all 2 issues
[Bandit] Creating fingerprints for all affected code blocks to track issues over different builds
[Bandit] -> created fingerprints for 2 issues (skipped 0 issues)
[Bandit] Copying affected files to Jenkins' build folder 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\CP2.1.1\builds\67\files-with-issues'
[Bandit] -> 1 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Bandit] Skipping cleaning of source code files in old builds
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1' that match the pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Successfully parsed file C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1\bandit.out
[Bandit] -> found 2 issues (skipped 0 duplicates)
[Bandit] Successfully processed file 'bandit.out'
[Bandit] Post processing issues on 'agent2' with source code encoding 'windows-1252'
[Bandit] Creating SCM blamer to obtain author and commit information for affected files
[Bandit] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Bandit] Resolving file names for all issues in workspace 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1'
[Bandit] -> resolved paths in source directory (1 found, 0 not found)
[Bandit] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Bandit] -> resolved module names for 2 issues
[Bandit] Resolving package names (or namespaces) by parsing the affected files
[Bandit] -> resolved package names of 1 affected files
[Bandit] No filter has been set, publishing all 2 issues
[Bandit] Creating fingerprints for all affected code blocks to track issues over different builds
[Bandit] -> created fingerprints for 2 issues (skipped 0 issues)
[Bandit] Copying affected files to Jenkins' build folder 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\CP2.1.1\builds\67\files-with-issues'
[Bandit] -> 1 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Bandit] Skipping cleaning of source code files in old builds
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Reference build recorder is not configured
[Bandit] No valid reference build found
[Bandit] All reported issues will be considered outstanding
[Bandit] Evaluating quality gates
[Bandit] -> Some quality gates have been missed: overall result is UNSTABLE
[Bandit] -> Details for each quality gate:
[Bandit]    - [Total (any severity)]: ≪Inestable≫ - (Actual value: 2, Quality gate: 2,00)
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 2, Quality gate: 4,00)
[Bandit] Health report is disabled - skipping
[Bandit] Created analysis result for 2 issues (found 0 new issues, fixed 0 issues)
[Bandit] Attaching ResultAction with ID 'pylint' to build 'Unir/CP2.1.1 #67'.
[Checks API] No suitable checks publisher found.
```

```
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Performance)
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>SET FLASK_APP=app\api.py

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>start /B
C:\Users\amaro\AppData\Local\Programs\Python\Python313\python.exe -m flask run --host=0.0.0.0 --port=5000

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>timeout /t 10 /nobreak
ERROR: No es compatible la redirecci¢n de entradas, saliendo inmediatamente
    del proceso.

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>rem Espera 10 segundos para asegurarse de que Flask
estÃ© listo antes de correr las pruebas

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1>C:\Users\amaro\Downloads\apache-jmeter-
5.6.3\apache-jmeter-5.6.3\bin\jmeter -n -t test\jmeter\flask.jmx -f -l flask.jtl
 * Serving Flask app 'app\api.py'
 * Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://192.168.1.57:5000
Press CTRL+C to quit
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using test\jmeter\flask.jmx
Starting standalone test @ 2025 Jan 25 11:56:35 CET (1737802595710)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary +      1 in 00:00:00 =    7.2/s Avg:    25 Min:    25 Max:    25 Err:     0 (0.00%) Active: 3 Started: 3 Finished: 0
summary +    159 in 00:00:01 =  187.5/s Avg:     2 Min:     1 Max:    25 Err:     0 (0.00%) Active: 0 Started: 20 Finished: 20
summary =    160 in 00:00:01 =  162.3/s Avg:     2 Min:     1 Max:    25 Err:     0 (0.00%)
Tidying up ...    @ 2025 Jan 25 11:56:36 CET (1737802596771)
... end of run
[Pipeline] script
[Pipeline] {
[Pipeline] readFile
[Pipeline] echo
Archivo coverage.xml leído correctamente.
[Pipeline] echo
Expresión 1.
[Pipeline] echo
Expresión 2.
[Pipeline] echo
Valor de lineCoverageMatch: java.util.regex.Matcher[pattern=<counter type="line" covered="(\d+)" region=0,2261 lastmatch=]
[Pipeline] echo
Valor de lineCoverage: 0
[Pipeline] echo
Valor de branchCoverageMatch: java.util.regex.Matcher[pattern=<counter type="branch" covered="(\d+)"  region=0,2261 lastmatch=]
[Pipeline] echo
Valor de branchCoverage: 0
[Pipeline] catchError
[Pipeline] {
[Pipeline] perfReport
Creating parser with percentiles:'0,50,90,95,100,' filterRegex:null
Performance: Recording JMeterCsv reports '**/flask.jtl'
Performance: JMeterCsv copying reports to master, files
'[C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\CP2.1.1\flask.jtl]'
Performance: JMeterCsv parsing local reports '[C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\CP2.1.1\builds\67\performance-
reports\JMeterCSV\flask.jtl]'
Performance: Parsing report file 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\CP2.1.1\builds\67\performance-reports\JMeterCSV\flask.jtl'
with filterRegex 'null'.
Performance: No threshold configured for making the test unstable
Performance: No threshold configured for making the test failure
Performance: File flask.jtl reported 0.0% of errors [SUCCESS]. Build status is: UNSTABLE
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: UNSTABLE
```

- Captura de pantalla de Jenkins donde se vea el resultado de la ejecución del pipeline.

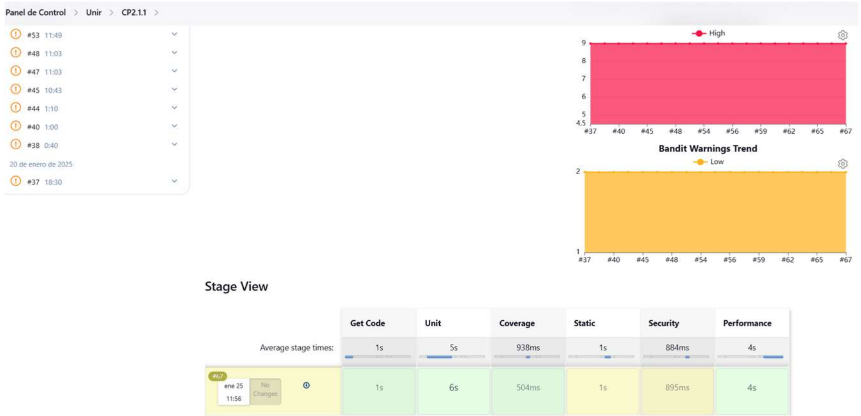


CP2.1.1

Full project name: Unir/CP2.1.1

Last Successful Artifacts
dashBoard_flask.xml 844 B view
standardResults.xml 516 B view

Today
#67 11:56
#66 11:53
#65 11:53
#63 11:42
24 de enero de 2025
#62 12:17
#61 12:11
#60 12:09
#59 12:04
#58 12:02
#57 11:59
#56 11:57
#55 11:54
#54 11:52
#53 11:49



Panel de Control > Unir > CP2.1.1 >

- #53 11:49
- #48 11:03
- #47 11:03
- #45 10:43
- #44 1:10
- #40 1:00
- #38 0:40

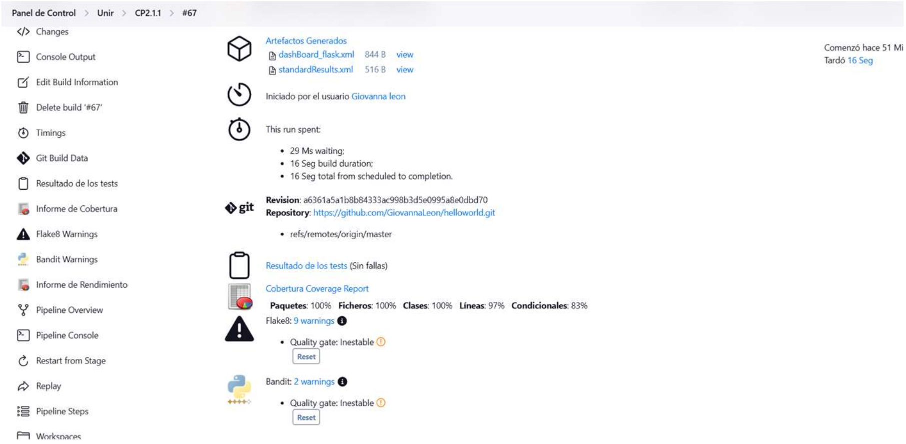
20 de enero de 2025

- #37 18:30

Stage View

	Get Code	Unit	Coverage	Static	Security	Performance
Average stage times:	1s	5s	938ms	1s	884ms	4s
#67 ene 25 11:56 No Changes	1s	6s	504ms	1s	895ms	4s

Resultados



Panel de Control > Unir > CP2.1.1 > #67

Artefactos Generados

dashBoard_flask.xml	844 B	view
standardResults.xml	516 B	view

Comenzó hace 51 Mi
Tardó 16 Seg

Iniciado por el usuario Giovanna leon

This run spent:

- 29 Ms waiting;
- 16 Seg build duration;
- 16 Seg total from scheduled to completion.

Revision: a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70
Repository: https://github.com/GiovannaLeon/helloworld.git

- refs/remotes/origin/master

Resultado de los tests (Sin fallas)

Cobertura Coverage Report

Paquetes: 100% **Ficheros**: 100% **Clases**: 100% **Líneas**: 97% **Condicionales**: 83%

Flake8: 9 warnings

- Quality gate: Inestable

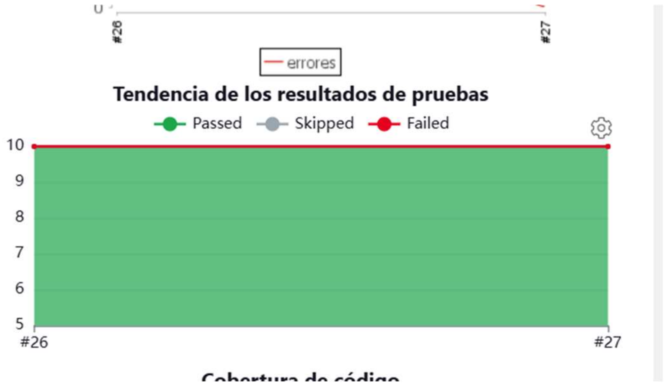
Reset

Bandit: 2 warnings

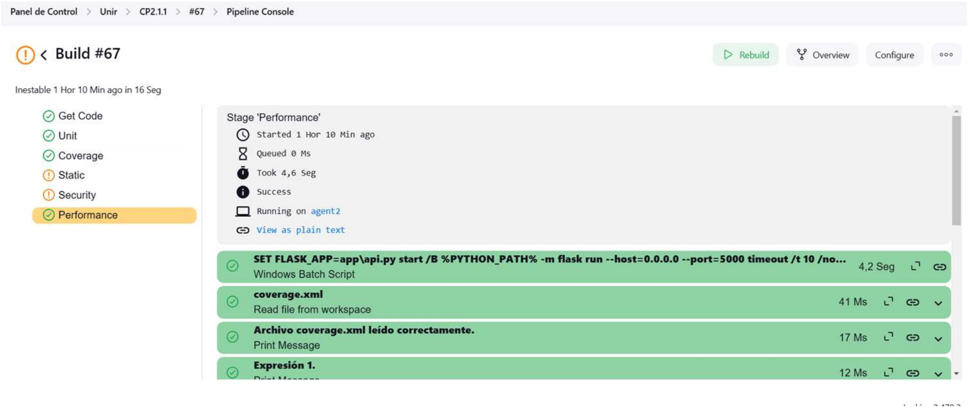
- Quality gate: Inestable

Reset

- Captura de pantalla de Jenkins donde se vea el resultado de los plugins:
  - Plugin Junit: evolución de los resultados de las pruebas unitarias.



  -



Panel de Control > Unir > CP2.1.1 > #67 > Pipeline Console

Build #67

Inestable 1 Hor 10 Min ago in 16 Seg

Stage 'Performance'

```
Started 1 Hor 10 Min ago
Queued 0 Ms
Took 4,6 Seg
Success
Running on agent2
View as plain text
```

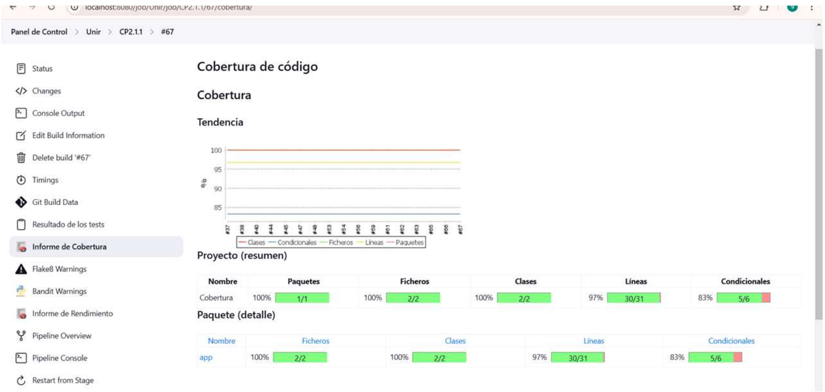
SET FLASK_APP=app\api.py start /B %PYTHON_PATH% -m flask run --host=0.0.0.0 --port=5000 timeout /t 10 /no... 4,2 Seg
Windows Batch Script

coverage.xml 41 Ms
Read file from workspace

Archivo coverage.xml leído correctamente. 17 Ms
Print Message

Expresión 1. 12 Ms

- Plugin Cobertura: evolución de la cobertura por líneas, ramas, etc.



localhost:8080/job/Unir/job/CP2.1.1/67/cobertura/

Panel de Control > Unir > CP2.1.1 > #67

Cobertura de código

Cobertura

Tendencia

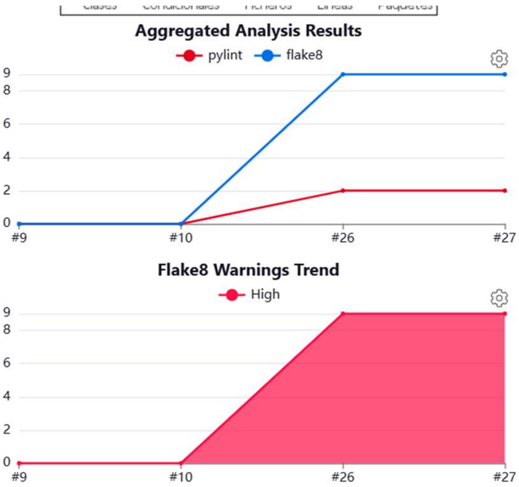
Proyecto (resumen)

Nombre	Paquetes		Ficheros		Clases		Líneas		Condicionales	
Cobertura	100%	1/1	100%	2/2	100%	2/2	97%	30/31	83%	5/6

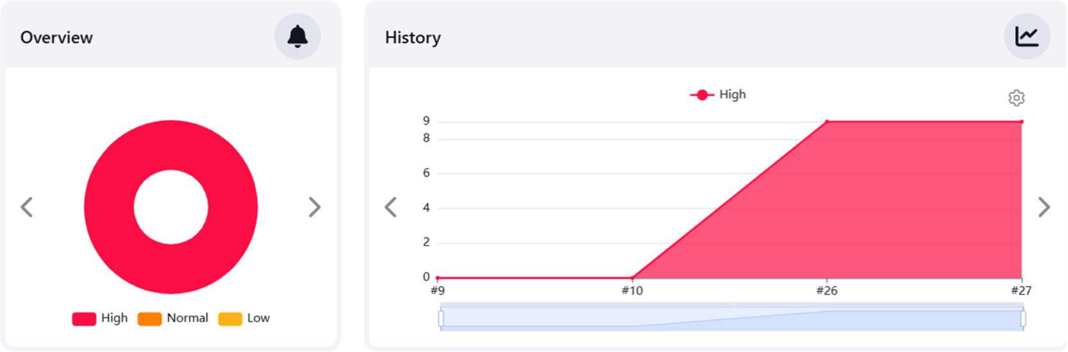
Paquete (detalle)

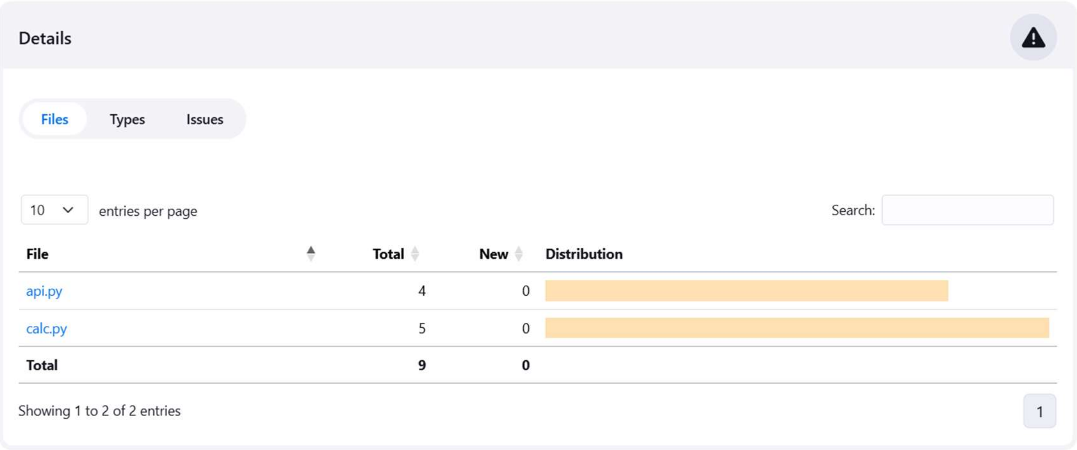
Nombre	Ficheros		Clases		Líneas		Condicionales	
app	100%	2/2	100%	2/2	97%	30/31	83%	5/6

- Plugin Warnings-NG (Flake8): evolución de los hallazgos encontrados.



Flake8 Warnings




Details

Files Types Issues

10 entries per page

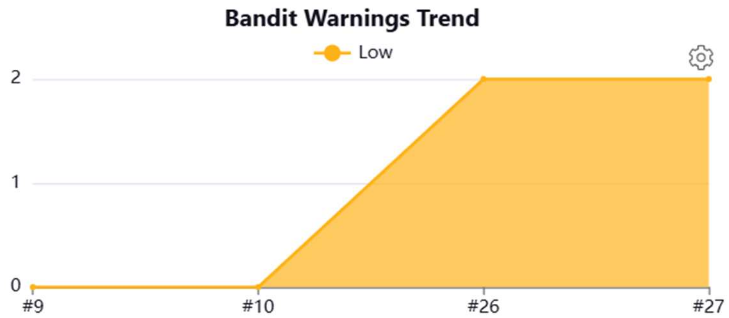
Search:

File	Total	New	Distribution
api.py	4	0	
calc.py	5	0	
Total	**9**	**0**	

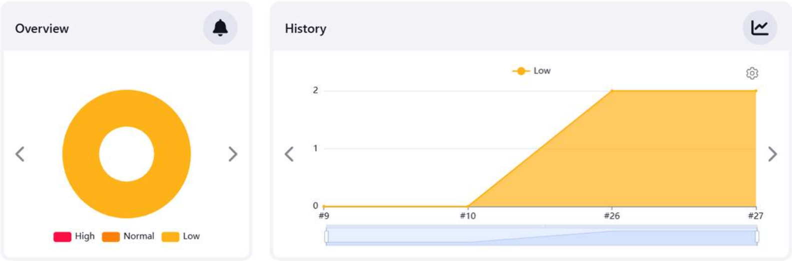
Showing 1 to 2 of 2 entries

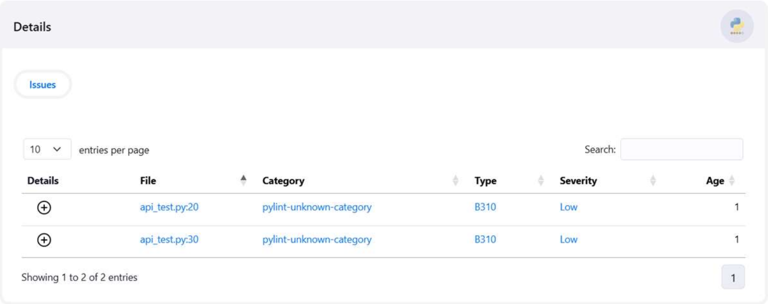
1

- Plugin Warnings-NG (Bandit): evolución de los hallazgos encontrados.



-





Details

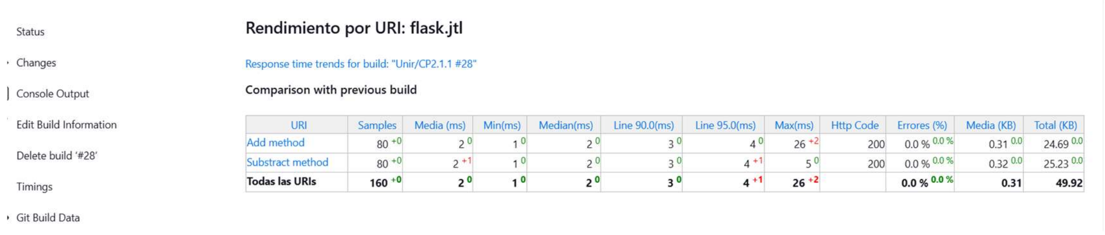
Issues

10 entries per page Search:

Details	File	Category	Type	Severity	Age
⊕	api_test.py:20	pylint-unknown-category	B310	Low	1
⊕	api_test.py:30	pylint-unknown-category	B310	Low	1

Showing 1 to 2 of 2 entries

- Plugin Performance: gráfica de tiempos de respuesta “Response Times (ms)” de ambos microservicios, y comentario sobre qué conclusiones se pueden extraer al observar esa gráfica.
  - Obtener el valor (aproximado) de línea 90 para el microservicio de suma e indicar en qué gráfica se puede obtener este dato, y qué significa este dato.

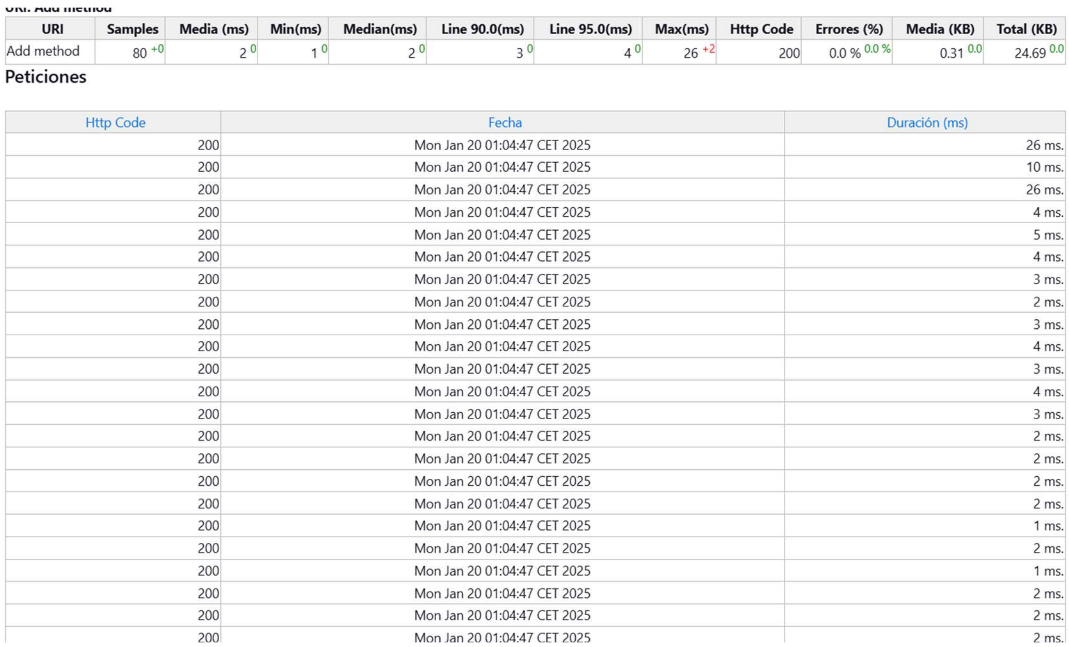


Rendimiento por URI: flask.jtl

Response time trends for build: "Unir/CP2.1.1 #28"

Comparison with previous build

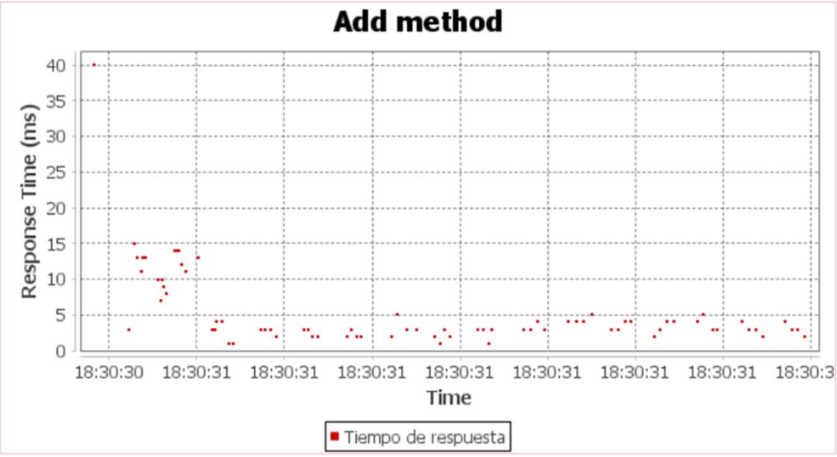
URI	Samples	Media (ms)	Min(ms)	Median(ms)	Line 90.0(ms)	Line 95.0(ms)	Max(ms)	Http Code	Errores (%)	Media (KB)	Total (KB)
Add method	80 +0	2 0	1 0	2 0	3 0	4 0	26 +2	200	0.0 % 0.0 %	0.31 0.0	24.69 0.0
Substract method	80 +0	2 +1	1 0	2 0	3 0	4 +1	5 0	200	0.0 % 0.0 %	0.32 0.0	25.23 0.0
Todas las URIs	**160 +0**	**2 0**	**1 0**	**2 0**	**3 0**	**4 +1**	**26 +2**		**0.0 % 0.0 %**	**0.31**	**49.92**

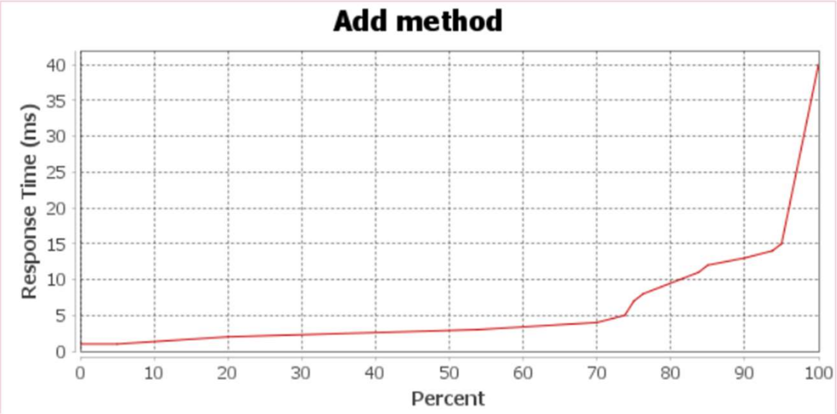


URI	Samples	Media (ms)	Min(ms)	Median(ms)	Line 90.0(ms)	Line 95.0(ms)	Max(ms)	Http Code	Errores (%)	Media (KB)	Total (KB)
Add method	80 +0	2 0	1 0	2 0	3 0	4 0	26 +2	200	0.0 % 0.0 %	0.31 0.0	24.69 0.0

Peticiones

Http Code	Fecha	Duración (ms)
200	Mon Jan 20 01:04:47 CET 2025	26 ms.
200	Mon Jan 20 01:04:47 CET 2025	10 ms.
200	Mon Jan 20 01:04:47 CET 2025	26 ms.
200	Mon Jan 20 01:04:47 CET 2025	4 ms.
200	Mon Jan 20 01:04:47 CET 2025	5 ms.
200	Mon Jan 20 01:04:47 CET 2025	4 ms.
200	Mon Jan 20 01:04:47 CET 2025	3 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.
200	Mon Jan 20 01:04:47 CET 2025	3 ms.
200	Mon Jan 20 01:04:47 CET 2025	4 ms.
200	Mon Jan 20 01:04:47 CET 2025	3 ms.
200	Mon Jan 20 01:04:47 CET 2025	4 ms.
200	Mon Jan 20 01:04:47 CET 2025	3 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.
200	Mon Jan 20 01:04:47 CET 2025	1 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.
200	Mon Jan 20 01:04:47 CET 2025	1 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.
200	Mon Jan 20 01:04:47 CET 2025	2 ms.





Significa: Que en la línea 90 suele tardar menos de 3 ms.

- Explicación del funcionamiento del pipeline.

Estructura general del Pipeline:

1. **Agente**:

```
agent any
```

Esto significa que el pipeline puede ejecutarse en cualquier agente disponible. Jenkins utilizará el agente disponible para ejecutar el pipeline.

2. **Entorno**:

```
environment {
   PYTHON_PATH = "C:\\Users\\amaro\\AppData\\Local\\Programs\\Python\\Python313\\python.exe"
   PYTHON_PATH_SCRIPTS = "C:\\Users\\amaro\\AppData\\Local\\Programs\\Python\\Python313\\Scripts"
}
```

En esta sección se definen variables de entorno para la ruta de Python y su directorio de scripts, de forma que puedas ejecutar los comandos de Python desde cualquier lugar del pipeline.

Etapas del Pipeline:

1. Get Code:

```
stage('Get Code') {
  steps {
    git 'https://github.com/GiovannaLeon/helloworld.git'
    bat "dir"
    echo WORKSPACE
  }
}
```

- **git**: Clona el repositorio desde GitHub.
- **bat "dir"**: Muestra el listado de archivos en el directorio.
- **echo WORKSPACE**: Muestra el espacio de trabajo actual de Jenkins.

2. Unit:

Esta etapa ejecuta las pruebas unitarias utilizando pytest y genera un reporte XML de las pruebas.

```
stage('Unit') {
   steps {
      catchError(buildResult: 'UNSTABLE', stageResult: 'FAILURE') {
         bat '''
            SET PYTHONPATH=%WORKSPACE%
            %PYTHON_PATH_SCRIPTS%\\coverage.exe run --branch --source=app --omit=app\\__init__.py,app\\api.py -m pytest
--junitxml=result-unit.xml test\\unit
         '''
         sleep(5)
         junit 'result-unit.xml'  // Reporte de las pruebas unitarias
      }
   }
}
```

- Ejecuta pytest con cobertura de código utilizando coverage.exe y genera un reporte en XML (result-unit.xml).
- Usa junit para publicar los resultados de las pruebas unitarias a Jenkins.

3. Coverage:

Esta etapa utiliza los resultados de las pruebas unitarias para generar el reporte de cobertura y publica este reporte en Jenkins.

```
stage('Coverage') {
   steps {
      bat '''
        %PYTHON_PATH_SCRIPTS%\\coverage.exe xml
      '''
      catchError(buildResult: 'UNSTABLE', stageResult: 'FAILURE') {
         cobertura coberturaReportFile: '**/coverage.xml', conditionalCoverageTargets: '100,0,80', lineCoverageTargets:
'100,0,90'
      }
   }
}
```

- Usa coverage.exe para generar el archivo coverage.xml, que luego es utilizado por el plugin de cobertura de Jenkins (cobertura) para mostrar un reporte.
- Los umbrales para la cobertura de código están definidos con conditionalCoverageTargets y lineCoverageTargets.

4. Static:

En esta etapa se realiza el análisis estático de código utilizando flake8 para detectar problemas de estilo de código.

```
stage('Static') {
   steps {
      bat '''
         %PYTHON_PATH_SCRIPTS%\\flake8.exe --exit-zero --format=pylint --exit-zero app >flake8.out
      '''
      recordIssues tools: [flake8(name: 'Flake8', pattern: '**/flake8.out')],
                 qualityGates: [
                    [threshold: 8, type: 'TOTAL', unstable: true],
                    [threshold: 10, type: 'TOTAL', unstable: false, healthy: false]
                 ]
   }
}
```

- Ejecuta flake8 para verificar los problemas de estilo de código.
- Publica los resultados con recordIssues y aplica umbrales de calidad.

5. Security:

Aquí se realiza un análisis de seguridad utilizando bandit, una herramienta para detectar vulnerabilidades en el código.

```
stage('Security') {
   steps {
      bat '''
         %PYTHON_PATH_SCRIPTS%\\bandit.exe --exit-zero -r . -f custom -o bandit.out --msg-template "{abspath}:{line}:
[{test_id}] {msg}"
      '''
      catchError(buildResult: 'SUCCESS', stageResult: 'UNSTABLE') {
         recordIssues tools: [pyLint(name: 'Bandit', pattern: '**/bandit.out')],
                   qualityGates: [
                      [threshold: 2, type: 'TOTAL', unstable: true],
                      [threshold: 4, type: 'TOTAL', unstable: false, healthy: false]
                   ]
      }
   }
}
```

- Utiliza bandit para analizar el código en busca de vulnerabilidades de seguridad.
- Publica los resultados con el plugin de Jenkins para mostrar los problemas de seguridad encontrados.

6. Performance:

Esta etapa realiza pruebas de rendimiento utilizando JMeter y ejecuta una aplicación Flask para simular el comportamiento de la aplicación bajo prueba.

```
stage('Performance') {
   steps {
       bat '''
         SET FLASK_APP=app\\api.py
         start /B %PYTHON_PATH% -m flask run --host=0.0.0.0 --port=5000
         timeout /t 10 /nobreak
         C:\\Users\\amaro\\Downloads\\apache-jmeter-5.6.3\\apache-jmeter-5.6.3\\bin\\jmeter -n -t test\\jmeter\\flask.jmx -f
-l flask.jtl
      '''
      script {
         try {
            def coverageFile = readFile('coverage.xml')
```

```
                echo "Archivo coverage.xml leído correctamente."
                // Procesamiento de cobertura
            } catch (Exception e) {
                echo "Error al leer coverage.xml: ${e.message}"
            }
        }
        catchError(buildResult: 'SUCCESS', stageResult: 'UNSTABLE') {
            perfReport sourceDataFiles: '**/flask.jtl'
        }
    }
}
```

- Ejecuta Flask en un servidor local y luego ejecuta las pruebas de rendimiento con JMeter.
- Utiliza el reporte generado por JMeter (flask.jtl) para mostrar el rendimiento de la aplicación.

Resumen:

Este pipeline de Jenkins realiza un ciclo completo de integración continua (CI) para una aplicación Python. Abarca:

1. **Obtener el código** desde un repositorio Git.
2. **Ejecutar pruebas unitarias** y generar reportes de resultados.
3. **Generar reportes de cobertura de código** y mostrar el resultado en Jenkins.
4. **Realizar análisis estático** de código con flake8.
5. **Realizar un análisis de seguridad** con bandit.
6. **Realizar pruebas de rendimiento** con JMeter.

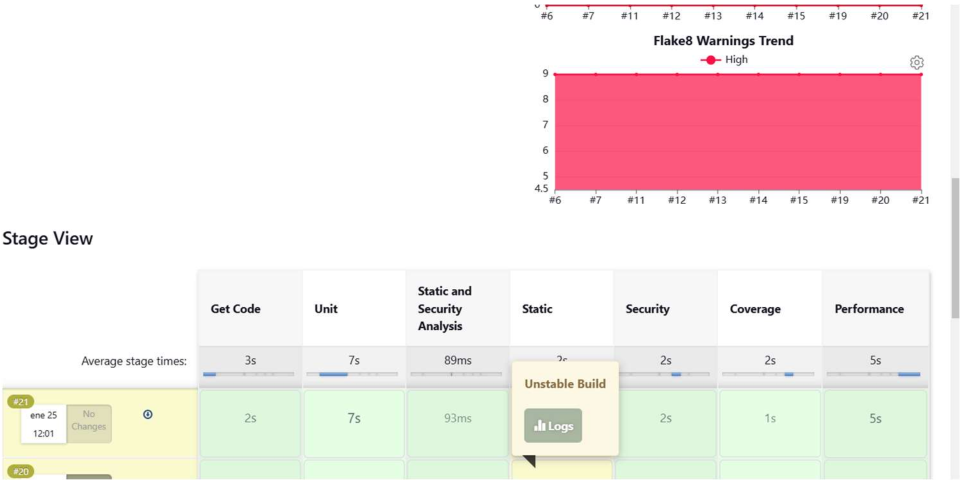
Este flujo asegura que el código sea revisado desde varios puntos de vista (funcionalidad, estilo, seguridad, y rendimiento) antes de ser desplegado, lo que facilita la integración continua y mejora la calidad del software.

Reto 2 – Distribución en agentes

En este reto se solicitan 3 entregables:

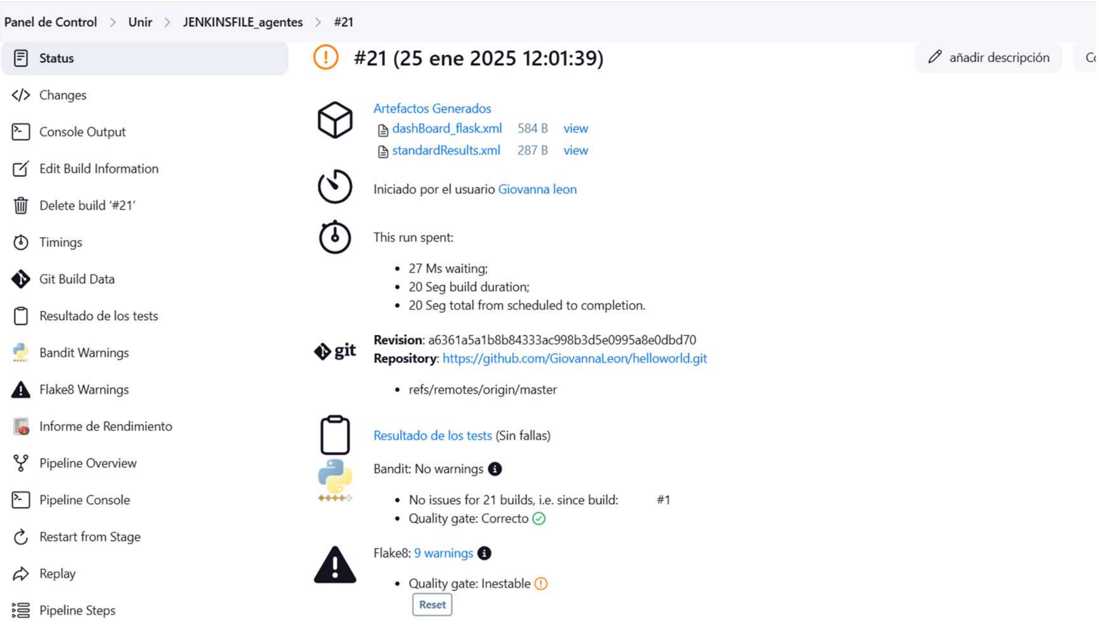
- URL al repositorio creado por el alumno, a partir del código fuente base de este CP1, que albergue tanto el código fuente como el nuevo Jenkinsfile.

  https://github.com/GiovannaLeon/helloworld/blob/master/CP2.1.1/JENKINSFILE_agentes.txt



Stage View

	Get Code	Unit	Static and Security Analysis	Static	Security	Coverage	Performance
Average stage times:	3s	7s	89ms	2s	2s	2s	5s
#21 ene 25 12:01 No Changes	2s	7s	93ms	Unstable Build Logs	2s	1s	5s
#20							



#21 (25 ene 2025 12:01:39)

Artefactos Generados

dashBoard_flask.xml	584 B	view
standardResults.xml	287 B	view

Iniciado por el usuario Giovanna leon

This run spent:

- 27 Ms waiting;
- 20 Seg build duration;
- 20 Seg total from scheduled to completion.

Revision: a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70
Repository: https://github.com/GiovannaLeon/helloworld.git

- refs/remotes/origin/master

Resultado de los tests (Sin fallas)

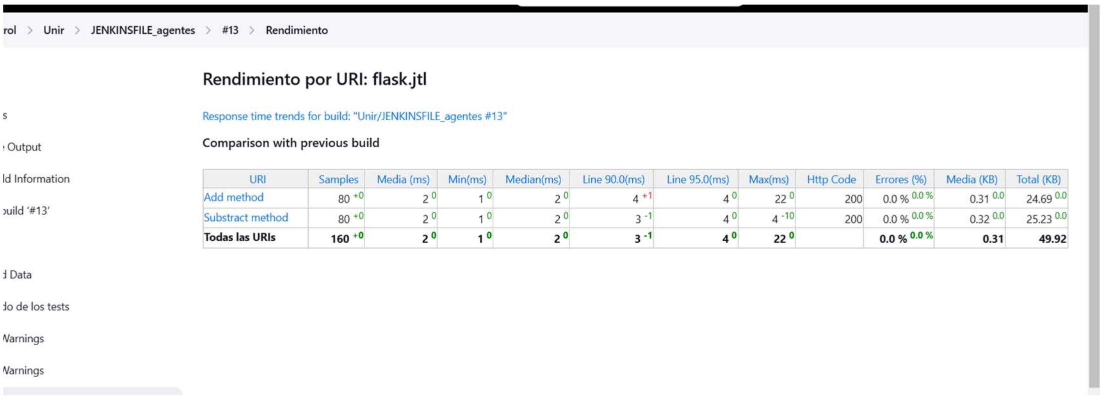
Bandit: No warnings

- No issues for 21 builds, i.e. since build: #1
- Quality gate: Correcto ✓

Flake8: 9 warnings

- Quality gate: Inestable (!)
  Reset

pipeline {



Rendimiento por URI: flask.jtl

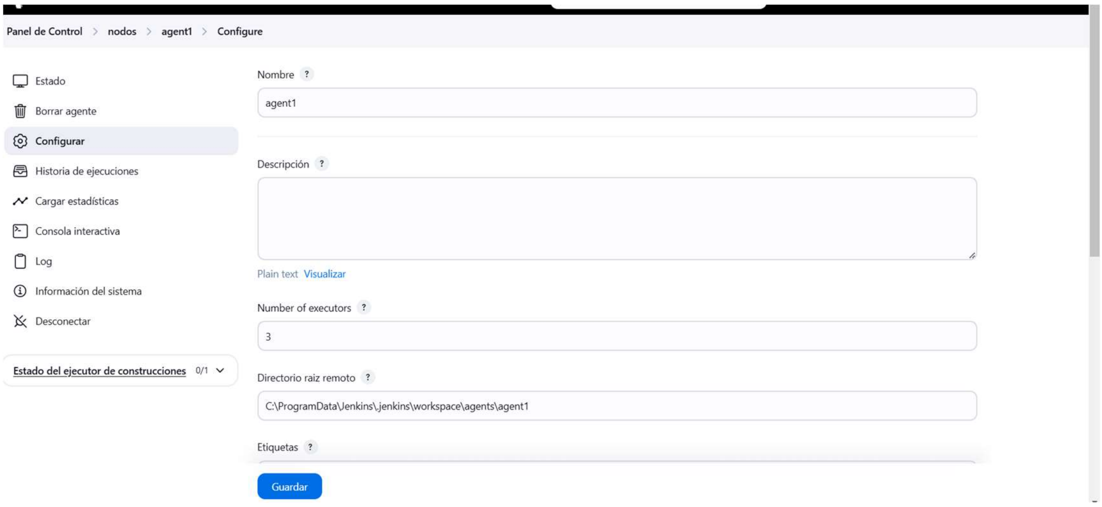
Response time trends for build: "Unir/JENKINSFILE_agentes #13"

Comparison with previous build

URI	Samples	Media (ms)	Min(ms)	Median(ms)	Line 90.0(ms)	Line 95.0(ms)	Max(ms)	Http Code	Errores (%)	Media (KB)	Total (KB)
Add method	80 +0	2 0	1 0	2 0	4 +1	4 0	22 0	200	0.0 % 0.0 %	0.31 0.0	24.69 0.0
Substract method	80 +0	2 0	1 0	2 0	3 -1	4 0	4 -10	200	0.0 % 0.0 %	0.32 0.0	25.23 0.0
Todas las URIs	**160 +0**	**2 0**	**1 0**	**2 0**	**3 -1**	**4 0**	**22 0**		**0.0 % 0.0 %**	**0.31**	**49.92**

```
pipeline {
agent none
   environment {
      PYTHON_PATH = "C:\\Users\\amaro\\AppData\\Local\\Programs\\Python\\Python313\\python.exe"
      PYTHON_PATH_SCRIPTS = "C:\\Users\\amaro\\AppData\\Local\\Programs\\Python\\Python313\\Scripts"

   }
   stages {
      stage('Get Code') {
         agent { label 'agent1' }  // Agente principal
         steps {
            bat "whoami"
            bat "hostname"
            bat "echo ${WORKSPACE}"
            git 'https://github.com/GiovannaLeon/helloworld.git'
            bat "dir"
            echo "Workspace: ${WORKSPACE}"
         }
      }

      stage('Unit') {
         agent { label 'agent1' }  // Agente principal
         steps {
            bat "whoami"
            bat "hostname"
            bat "echo ${WORKSPACE}"
            catchError(buildResult: 'UNSTABLE', stageResult: 'FAILURE') {
               bat '''
                  SET PYTHONPATH=%WORKSPACE%
                  %PYTHON_PATH_SCRIPTS%\\coverage.exe  run  --branch  --source=app  --omit=app\\__init__.py,app\\api.py  -m
pytest  --junitxml=result-unit.xml test\\unit

               '''
               sleep(5)
               junit 'result*.xml' // Reporte de las pruebas unitarias
            }
         }
      }



      stage('Static and Security Analysis') {
         parallel {
            stage('Static') {
               agent { label 'agent1' }  // Agente principal
               steps {
                  bat "whoami"
                  bat "hostname"
                  bat "echo ${WORKSPACE}"
                  bat '''
                    %PYTHON_PATH_SCRIPTS%\\flake8.exe --exit-zero --format=pylint --exit-zero app >flake8.out
                  '''
                  // Umbrales para Flake8
                  recordIssues tools: [flake8(name: 'Flake8', pattern: '**/flake8.out')],
                         qualityGates: [
                           [threshold: 8, type: 'TOTAL', unstable: true],  // 8 o más hallazgos -> Unstable
                           [threshold: 10, type: 'TOTAL', unstable: false, healthy: false]  // 10 o más hallazgos -> Unhealthy
                         ]
               }
            }

            stage('Security') {
               agent { label 'agent2' }  // Agente dedicado a seguridad
               steps {
                  bat "whoami"
                  bat "hostname"
                  bat "echo ${WORKSPACE}"
                  bat '''
                    %PYTHON_PATH_SCRIPTS%\\bandit.exe --exit-zero -r . -f custom -o bandit.out --msg-template "{abspath}:{line}:
[{test_id}] {msg}"
                  '''
                  catchError(buildResult: 'SUCCESS', stageResult: 'UNSTABLE') {
                    // Usamos el patrón relativo para buscar 'bandit.out' y aplicar los Quality Gates
                    recordIssues tools: [pyLint(name: 'Bandit', pattern: '**/bandit.out')],
                          qualityGates: [
                            [threshold: 2, type: 'TOTAL', unstable: true],   // 2 o más hallazgos -> Unstable
                            [threshold: 4, type: 'TOTAL', unstable: false, healthy: false]  // 4 o más hallazgos -> Unhealthy
                          ]
                  }
               }
            }
         }
      }

      stage('Coverage') {
         agent { label 'agent1' }  // Agente principal
         steps {
            bat "whoami"
            bat "hostname"
            bat "echo ${WORKSPACE}"
            bat '''
               %PYTHON_PATH_SCRIPTS%\\coverage.exe xml
            '''
            catchError(buildResult: 'UNSTABLE', stageResult: 'FAILURE') {
               cobertura  coberturaReportFile:  '**/coverage.xml',  conditionalCoverageTargets:  '100,0,80',  lineCoverageTargets:
'100,0,90'
            }
         }
      }

    stage('Performance') {
         agent { label 'agent3' }  // Agente dedicado a pruebas de rendimiento
         steps {
            bat "whoami"
            bat "hostname"
            bat "echo ${WORKSPACE}"
            bat '''
             SET FLASK_APP=app\\api.py
               start /B %PYTHON_PATH% -m flask run --host=0.0.0.0 --port=5000
               timeout /t 20 /nobreak  // Espera 10 segundos para asegurarse de que Flask esté listo antes de correr las pruebas
               C:\\Users\\amaro\\Downloads\\apache-jmeter-5.6.3\\apache-jmeter-5.6.3\\bin\\jmeter                -n                -t
test\\jmeter\\flask.jmx -f -l flask.jtl
            '''
            script {

               // Después de la ejecución de las pruebas de rendimiento y la cobertura, procesamos el reporte
             //  catchError(buildResult: 'SUCCESS', stageResult: 'UNSTABLE') {
                  // Ejecutar el reporte de rendimiento
                  perfReport sourceDataFiles: '**/flask.jtl'
            //    }
            }
         }
      }

    }
}
```

- Log de la ejecución del pipeline (debe visualizarse un “whoami” y “hostname” para identificar el agente empleado en cada etapa).



Nombre: agent1

Descripción:

Number of executors: 3

Directorio raiz remoto: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1

```
Lanzada por el usuario Giovanna leon

[Pipeline] Start of Pipeline
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Get Code)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] git
The recommended git tool is: NONE
```

```
No credentials specified
Fetching changes from the remote Git repository
Checking out Revision a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 (refs/remotes/origin/master)
 >  git.exe  rev-parse  --resolve-git-dir  C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes\.git  #
timeout=10
 > git.exe config remote.origin.url https://github.com/GiovannaLeon/helloworld.git # timeout=10
Fetching upstream changes from https://github.com/GiovannaLeon/helloworld.git
 > git.exe --version # timeout=10
 > git --version # 'git version 2.47.1.windows.1'
 > git.exe fetch --tags --force --progress -- https://github.com/GiovannaLeon/helloworld.git +refs/heads/*:refs/remotes/origin/* # timeout=10
 > git.exe rev-parse "refs/remotes/origin/master^{commit}" # timeout=10
 > git.exe config core.sparsecheckout # timeout=10
 > git.exe checkout -f a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 # timeout=10
 > git.exe branch -a -v --no-abbrev # timeout=10
 > git.exe branch -D master # timeout=10
 > git.exe checkout -b master a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 # timeout=10
Commit message: "Add files via upload"
 > git.exe rev-list --no-walk a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 # timeout=10
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>dir
 El volumen de la unidad C es Windows
 El n£mero de serie del volumen es: 6475-04AA

 Directorio de C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes

25/01/2025  12:00    <DIR>          .
23/01/2025  16:51    <DIR>          ..
25/01/2025  12:00            53.248 .coverage
20/01/2025  01:38                40 .gitignore
20/01/2025  01:38    <DIR>          .pytest_cache
20/01/2025  01:38    <DIR>          app
25/01/2025  12:00             2.273 coverage.xml
25/01/2025  12:00    <DIR>          CP2.1.1
25/01/2025  12:00               500 flake8.out
20/01/2025  01:38    <DIR>          jenkinsFile_1
20/01/2025  01:38    <DIR>          jenkinsFile_2
20/01/2025  01:38    <DIR>          JenkinsFile_3
20/01/2025  01:38    <DIR>          jenkinsfile_4
20/01/2025  01:38               175 pytest.ini
20/01/2025  01:38               418 README.md
25/01/2025  12:00             1.401 result-unit.xml
20/01/2025  01:38    <DIR>          test
               7 archivos         58.055 bytes
              10 dirs  560.652.320.768 bytes libres
[Pipeline] echo
Workspace: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Unit)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] catchError
[Pipeline] {
[Pipeline] bat
```

```
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>SET
PYTHONPATH=C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\Scripts\coverage.exe  run  --branch  --source=app  --omit=app\__init__.py,app\api.py  -m  pytest   --junitxml=result-unit.xml
test\unit
============================ test session starts ============================
platform win32 -- Python 3.13.0, pytest-8.3.4, pluggy-1.5.0
rootdir: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
configfile: pytest.ini
collected 10 items

test\unit\calc_test.py ........                                        [ 80%]
test\unit\util_test.py ..                                              [100%]

- generated xml file: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes\result-unit.xml -
============================ 10 passed in 0.14s =============================
[Pipeline] sleep
Sleeping for 5 Seg
[Pipeline] junit
Grabando resultados de tests
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Static and Security Analysis)
[Pipeline] parallel
[Pipeline] { (Branch: Static)
[Pipeline] { (Branch: Security)
[Pipeline] stage
[Pipeline] { (Static)
[Pipeline] stage
[Pipeline] { (Security)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] node
Running on agent2
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] {
[Pipeline] bat
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\Scripts\flake8.exe --exit-zero --format=pylint --exit-zero app  1>flake8.out

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\Scripts\bandit.exe --exit-zero -r . -f custom -o bandit.out --msg-template "{abspath}:{line}: [{test_id}] {msg}"
[main]      INFO      profile include tests: None
[main]      INFO      profile exclude tests: None
[main]      INFO      cli include tests: None
[main]      INFO      cli exclude tests: None
[main]      INFO      running on Python 3.13.0
[custom]    INFO      Result written to file: bandit.out
[Pipeline] catchError
[Pipeline] {
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Bandit] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes' that match
the pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Skipping file 'bandit.out' because it's empty
[Bandit] Skipping post processing
[Bandit] No filter has been set, publishing all 0 issues
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes' that match
the pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Skipping file 'bandit.out' because it's empty
[Bandit] Skipping post processing
[Bandit] No filter has been set, publishing all 0 issues
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Reference build recorder is not configured
[Bandit] No valid reference build found
[Bandit] All reported issues will be considered outstanding
[Bandit] Evaluating quality gates
[Bandit] -> All quality gates have been passed
[Bandit] -> Details for each quality gate:
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 0, Quality gate: 2,00)
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 0, Quality gate: 4,00)
[Bandit] Health report is disabled - skipping
[Bandit] Created analysis result for 0 issues (found 0 new issues, fixed 0 issues)
[Bandit] Attaching ResultAction with ID 'pylint' to build 'Unir/JENKINSFILE_agentes #21'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Flake8] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes' that match
the pattern '**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent1' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
```

```
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes\builds\21\files-with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes' that match the pattern '**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent1' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes\builds\21\files-with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Reference build recorder is not configured
[Flake8] No valid reference build found
[Flake8] All reported issues will be considered outstanding
[Flake8] Evaluating quality gates
[Flake8] -> Some quality gates have been missed: overall result is UNSTABLE
[Flake8] -> Details for each quality gate:
[Flake8]    - [Total (any severity)]: ≪Inestable≫ - (Actual value: 9, Quality gate: 8,00)
[Flake8]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 9, Quality gate: 10,00)
[Flake8] Health report is disabled - skipping
[Flake8] Created analysis result for 9 issues (found 0 new issues, fixed 0 issues)
[Flake8] Attaching ResultAction with ID 'flake8' to build 'Unir/JENKINSFILE_agentes #21'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // parallel
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Coverage)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] bat
```

```
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\Scripts\coverage.exe xml
Wrote XML report to coverage.xml
[Pipeline] catchError
[Pipeline] {
[Pipeline] cobertura
[Cobertura] Skipping Cobertura coverage report as build was not SUCCESS or better ...

[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Performance)
[Pipeline] node
Running on agent3
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>SET FLASK_APP=app\api.py

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>start /B
C:\Users\amaro\AppData\Local\Programs\Python\Python313\python.exe -m flask run --host=0.0.0.0 --port=5000

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>timeout /t 20 /nobreak // Espera 10
segundos para asegurarse de que Flask estÃ© listo antes de correr las pruebas
ERROR: Sintaxis no v lida. La opci¢n predeterminada no est  permitida m s
de "1" veces.
Escriba "TIMEOUT /?" para su uso.

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\Downloads\apache-
jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter -n -t test\jmeter\flask.jmx -f -l flask.jtl
Usage: python -m flask run [OPTIONS]
Try 'python -m flask run --help' for help.

Error: Could not import 'api'.
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using test\jmeter\flask.jmx
Starting standalone test @ 2025 Jan 25 12:01:56 CET (1737802916113)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary =    200 in 00:00:01 =  223.5/s Avg:     1 Min:     1 Max:    19 Err:     0 (0.00%)
Tidying up ...    @ 2025 Jan 25 12:01:57 CET (1737802917089)
... end of run
[Pipeline] script
[Pipeline] {
[Pipeline] perfReport
Creating parser with percentiles:'0,50,90,95,100,' filterRegex:null
Performance: Recording JMeterCsv reports '**/flask.jtl'
Performance: JMeterCsv copying reports to master, files
'[C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes\flask.jtl]'
Performance: JMeterCsv parsing local reports '[C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes\builds\21\performance-
reports\JMeterCSV\flask.jtl]'
Performance: Parsing report file 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes\builds\21\performance-reports\JMeterCSV\flask.jtl' with filterRegex 'null'.
Performance: No threshold configured for making the test unstable
Performance: No threshold configured for making the test failure
Performance: File flask.jtl reported 0.0% of errors [SUCCESS]. Build status is: UNSTABLE
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] End of Pipeline
Finished: UNSTABLE
```

Lo que sucede en el pipeline:

- **Etapas en paralelo**: En el stage "Static and Security Analysis", hay dos etapas ("Static" y "Security") que se ejecutan en paralelo. Esto significa que Jenkins intentará ejecutar ambas etapas de manera simultánea, lo que se ve beneficiado por los 3 ejecutores de los agentes correspondientes (en este caso, "agent1" para la etapa de Static y "agent2" para la etapa de Security).
  - Como tienes 3 ejecutores en cada agente, si tienes varias tareas en un mismo agente, se ejecutarán al mismo tiempo, siempre y cuando no haya otras restricciones (por ejemplo, otras tareas en espera de los ejecutores disponibles).
- **Uso de recursos en paralelo**: Al tener 3 ejecutores en cada agente, si tienes varias etapas en un mismo agente (como ocurre con "agent1"), Jenkins podrá ejecutar varias de esas tareas en paralelo, sin tener que esperar que se liberen otros ejecutores. Esto aumenta la eficiencia y disminuye el tiempo total de ejecución del pipeline.

Impacto del uso de 3 ejecutores:

- **Eficiencia**: Tener múltiples ejecutores permite que Jenkins ejecute varios trabajos a la vez, reduciendo el tiempo total de ejecución del pipeline, especialmente si tienes muchas etapas que requieren un agente.
- **Posible sobrecarga**: Si el número de ejecutores por agente es mayor que la cantidad de trabajos que el agente puede manejar efectivamente, podrías estar desperdiciando recursos. Sin embargo, tener múltiples ejecutores es útil si tus tareas pueden aprovechar la concurrencia y si tu agente tiene suficientes recursos de hardware (CPU, memoria, etc.) para soportar múltiples ejecuciones al mismo tiempo.

Resumen:

Con **3 ejecutores por agente**, Jenkins puede ejecutar simultáneamente hasta 3 trabajos diferentes en el mismo agente. Esto permite un mejor uso de los recursos y acelera la ejecución de tareas concurrentes. En tu pipeline, cuando se ejecutan tareas paralelas o en la misma máquina, estas podrán ejecutarse simultáneamente si están en diferentes ejecutores. Esto mejora la eficiencia general del pipeline y reduce los tiempos de espera.

- Log y explicación sobre lo que ocurre cuando el número de executors se reduce a 1, teniendo 4-5-6 etapas ejecutándose simultáneamente en 2-3 agentes.

```
Lanzada por el usuario Giovanna leon
[Pipeline] Start of Pipeline
[Pipeline] stage
[Pipeline] { (Get Code)
[Pipeline] node
Running on agent1 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] git
The recommended git tool is: NONE
No credentials specified
Fetching changes from the remote Git repository
 > git.exe rev-parse --resolve-git-dir C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes\.git #
timeout=10
 > git.exe config remote.origin.url https://github.com/GiovannaLeon/helloworld.git # timeout=10
Fetching upstream changes from https://github.com/GiovannaLeon/helloworld.git
 > git.exe --version # timeout=10
 > git --version # 'git version 2.47.1.windows.1'
 > git.exe fetch --tags --force --progress -- https://github.com/GiovannaLeon/helloworld.git +refs/heads/*:refs/remotes/origin/* # timeout=10
Checking out Revision eb8d8309fcd89b880e7bc330d180dfeceaf53b9a (refs/remotes/origin/master)
Commit message: "Add files via upload"
 > git.exe rev-parse "refs/remotes/origin/master^{commit}" # timeout=10
 > git.exe config core.sparsecheckout # timeout=10
 > git.exe checkout -f eb8d8309fcd89b880e7bc330d180dfeceaf53b9a # timeout=10
 > git.exe branch -a -v --no-abbrev # timeout=10
 > git.exe branch -D master # timeout=10
 > git.exe checkout -b master eb8d8309fcd89b880e7bc330d180dfeceaf53b9a # timeout=10
 > git.exe rev-list --no-walk eb8d8309fcd89b880e7bc330d180dfeceaf53b9a # timeout=10
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>dir
 El volumen de la unidad C es Windows
 El n£mero de serie del volumen es: 6475-04AA

 Directorio de C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes

20/01/2025  23:04    <DIR>          .
20/01/2025  01:38    <DIR>          ..
20/01/2025  23:04            53.248 .coverage
20/01/2025  01:38                40 .gitignore
20/01/2025  01:38    <DIR>          .pytest_cache
20/01/2025  01:38    <DIR>          app
20/01/2025  23:04             2.273 coverage.xml
20/01/2025  23:04               500 flake8.out
20/01/2025  01:38    <DIR>          jenkinsFile_1
20/01/2025  01:38    <DIR>          jenkinsFile_2
20/01/2025  01:38    <DIR>          JenkinsFile_3
20/01/2025  01:38    <DIR>          jenkinsfile_4
20/01/2025  01:38               175 pytest.ini
20/01/2025  01:38               418 README.md
```

```
20/01/2025  23:04           1.401 result-unit.xml
20/01/2025  01:38    <DIR>          test
               7 archivos         58.055 bytes
               9 dirs  564.906.209.280 bytes libres
[Pipeline] echo
Workspace: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Unit)
[Pipeline] node
Running on agent1 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] catchError
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>SET
PYTHONPATH=C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\python.exe -m pytest --junitxml=result-unit.xml test\unit
============================= test session starts =============================
platform win32 -- Python 3.13.0, pytest-8.3.4, pluggy-1.5.0
rootdir: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
configfile: pytest.ini
collected 10 items

test\unit\calc_test.py ........                                          [ 80%]
test\unit\util_test.py ..                                                [100%]

- generated xml file: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes\result-unit.xml -
============================= 10 passed in 0.10s ==============================
[Pipeline] sleep
Sleeping for 5 Seg
[Pipeline] junit
Grabando resultados de tests
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Static and Security Analysis)
[Pipeline] parallel
[Pipeline] { (Branch: Static)
[Pipeline] { (Branch: Security)
[Pipeline] stage
[Pipeline] { (Static)
[Pipeline] stage
[Pipeline] { (Security)
[Pipeline] node
Running on agent1 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] node
Running on agent2 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
```

```
[Pipeline] {
[Pipeline] bat
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\Scripts\flake8.exe --exit-zero --format=pylint --exit-zero app  1>flake8.out

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\Scripts\bandit.exe --exit-zero -r . -f custom -o bandit.out --msg-template "{abspath}:{line}: [{test_id}] {msg}"
[main]      INFO      profile include tests: None
[main]      INFO      profile exclude tests: None
[main]      INFO      cli include tests: None
[main]      INFO      cli exclude tests: None
[main]      INFO      running on Python 3.13.0
[custom]    INFO      Result written to file: bandit.out
[Pipeline] catchError
[Pipeline] {
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Bandit] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes' that match
the pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Skipping file 'bandit.out' because it's empty
[Bandit] Skipping post processing
[Bandit] No filter has been set, publishing all 0 issues
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes' that match
the pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Skipping file 'bandit.out' because it's empty
[Bandit] Skipping post processing
[Bandit] No filter has been set, publishing all 0 issues
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Reference build recorder is not configured
[Bandit] No valid reference build found
[Bandit] All reported issues will be considered outstanding
[Bandit] Evaluating quality gates
[Bandit] -> All quality gates have been passed
[Bandit] -> Details for each quality gate:
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 0, Quality gate: 2,00)
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 0, Quality gate: 4,00)
[Bandit] Health report is disabled - skipping
[Bandit] Created analysis result for 0 issues (found 0 new issues, fixed 0 issues)
[Bandit] Attaching ResultAction with ID 'pylint' to build 'Unir/JENKINSFILE_agentes #15'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Flake8] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes' that match
the pattern '**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent1' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes\builds\15\files-
with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes' that match
the pattern '**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent1' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes\builds\15\files-
with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Reference build recorder is not configured
[Flake8] No valid reference build found
[Flake8] All reported issues will be considered outstanding
[Flake8] Evaluating quality gates
[Flake8] -> Some quality gates have been missed: overall result is UNSTABLE
[Flake8] -> Details for each quality gate:
[Flake8]    - [Total (any severity)]: ≪Inestable≫ - (Actual value: 9, Quality gate: 8,00)
[Flake8]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 9, Quality gate: 10,00)
[Flake8] Health report is disabled - skipping
[Flake8] Created analysis result for 9 issues (found 0 new issues, fixed 0 issues)
[Flake8] Attaching ResultAction with ID 'flake8' to build 'Unir/JENKINSFILE_agentes #15'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // node
```

```
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // parallel
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Coverage)
[Pipeline] node
Running on agent1 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\Scripts\coverage.exe run --branch --source=app --omit=app\__init__.py,app\api.py -m pytest test\unit
============================= test session starts =============================
platform win32 -- Python 3.13.0, pytest-8.3.4, pluggy-1.5.0
rootdir: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes
configfile: pytest.ini
collected 10 items

test\unit\calc_test.py ........                                          [ 80%]
test\unit\util_test.py ..                                               [100%]

============================= 10 passed in 0.03s ==============================

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\AppData\Local\Programs\
Python\Python313\Scripts\coverage.exe xml
Wrote XML report to coverage.xml
[Pipeline] catchError
[Pipeline] {
[Pipeline] cobertura
[Cobertura] Skipping Cobertura coverage report as build was not SUCCESS or better ...

[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Performance)
[Pipeline] node
Running on agent3 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes
[Pipeline] bat
```

```
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>SET FLASK_APP=app\api.py

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>start /B
C:\Users\amaro\AppData\Local\Programs\Python\Python313\python.exe -m flask run --host=0.0.0.0 --port=5000

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>timeout /t 20 /nobreak // Espera 10
segundos para asegurarse de que Flask estÃ© listo antes de correr las pruebas
ERROR: Sintaxis no v lida. La opci¢n predeterminada no est  permitida m s
de "1" veces.
Escriba "TIMEOUT /?" para su uso.

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes>C:\Users\amaro\Downloads\apache-
jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter -n -t test\jmeter\flask.jmx -f -l flask.jtl
Usage: python -m flask run [OPTIONS]
Try 'python -m flask run --help' for help.

Error: Could not import 'api'.
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using test\jmeter\flask.jmx
Starting standalone test @ 2025 Jan 20 23:16:52 CET (1737411412267)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary =    160 in 00:00:01 =  161.9/s Avg:     2 Min:     1 Max:    23 Err:     0 (0.00%)
Tidying up ...    @ 2025 Jan 20 23:16:53 CET (1737411413322)
... end of run
[Pipeline] script
[Pipeline] {
[Pipeline] perfReport
Creating parser with percentiles:'0,50,90,95,100,' filterRegex:null
Performance: Recording JMeterCsv reports '**/flask.jtl'
Performance: JMeterCsv copying reports to master, files
'[C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes\flask.jtl]'
Performance: JMeterCsv parsing local reports '[C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes\builds\15\performance-
reports\JMeterCSV\flask.jtl]'
Performance: Parsing report file 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes\builds\15\performance-
reports\JMeterCSV\flask.jtl' with filterRegex 'null'.
Performance: No threshold configured for making the test unstable
Performance: No threshold configured for making the test failure
Performance: File flask.jtl reported 0.0% of errors [SUCCESS]. Build status is: UNSTABLE
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] End of Pipeline
Finished: UNSTABLE
```

Reducir el número de **executors** a **1** por agente disminuye la capacidad de ejecución simultánea de Jenkins. En un pipeline con múltiples etapas, especialmente cuando tienes muchas etapas que necesitan ejecutarse en paralelo en **varios agentes**, reducir los ejecutores provoca **cuellos de botella** y **tiempos de espera**, lo que aumenta el tiempo total de ejecución. Las etapas se ejecutarán de manera **secuencial en cada agente**, y las tareas tendrán que esperar a que se liberen los ejecutores disponibles, lo que afecta la eficiencia del pipeline. Esto podría ser una limitación si tu infraestructura o pipeline tiene una gran cantidad de tareas concurrentes o si las tareas son pesadas

- Explicación de la separación realizada y fundamentación de la misma.

1. Separación de Agentes:

La decisión de separar las etapas en distintos agentes tiene varias motivaciones estratégicas y técnicas:

A. Optimización de recursos:

- **agent1** está asignado a las etapas de **'Get Code'**, **'Unit'**, **'Static'** y **'Coverage'**. Este agente parece estar optimizado para tareas de desarrollo, como la compilación, las pruebas unitarias, el análisis estático y la cobertura de pruebas.
    - Al agrupar estas tareas en un solo agente, se garantiza que el entorno de desarrollo, las dependencias y las herramientas específicas estén preinstaladas y configuradas correctamente en un único lugar, lo que mejora la coherencia de los resultados y la eficiencia del pipeline.
- **agent2** está dedicado a la etapa de **'Security'** (análisis de seguridad con Bandit). Se utiliza un agente diferente para realizar el análisis de seguridad porque, generalmente, este tipo de herramientas puede requerir una configuración específica o permisos adicionales (por ejemplo, configuraciones de seguridad, entornos de red aislados, etc.).
    - Utilizar un agente separado para las pruebas de seguridad reduce el riesgo de interferencias con las tareas de desarrollo o de ejecución de código en el mismo entorno, y también permite configurar este agente con políticas de seguridad adicionales sin afectar el flujo principal de integración.
- **agent3** está asignado a la etapa de **'Performance'** (pruebas de rendimiento con JMeter y ejecución de Flask). Este agente está dedicado a tareas de rendimiento, que generalmente requieren recursos adicionales y configuraciones específicas, como configuraciones de red o servidores.
    - Al usar un agente especializado para pruebas de rendimiento, se evita que estas pruebas interfieran con las etapas de desarrollo y pruebas unitarias que podrían tener un impacto en el rendimiento del servidor.

B. Aislamiento y Especialización:

Separar las tareas en diferentes agentes permite que cada uno esté especializado para un conjunto específico de tareas, lo que facilita la **gestión de dependencias** y evita problemas de **interferencia** entre las distintas fases del pipeline.

- **Entornos de ejecución diferenciados:** Algunas etapas, como las de seguridad (con Bandit) y de pruebas de rendimiento, pueden requerir un acceso más restringido o una configuración diferente, como privilegios elevados para ejecutar herramientas específicas, o la necesidad de acceso a bases de datos o servidores de prueba.

- **Facilidad de mantenimiento:** Si se encuentra un error en una de las etapas (por ejemplo, en las pruebas de seguridad), el cambio puede realizarse de manera aislada en el agente correspondiente sin afectar a los demás agentes, lo que facilita la **gestión de problemas**.

2. Creación de Agentes: Métodos Empleados

Existen varias formas de crear y gestionar agentes en Jenkins, los cuales pueden ser **agentes físicos** o **virtuales**. El método empleado para la creación de estos agentes no se especifica explícitamente en el pipeline, pero se puede inferir que probablemente se están utilizando **agentes remotos gestionados por SSH** o **agentes basados en Java** (usualmente Jenkins master/slave).

A. Agentes gestionados por SSH:

Una de las formas más comunes de crear agentes en Jenkins es mediante **SSH**. El master de Jenkins se comunica con un nodo esclavo a través de un servidor SSH para ejecutar tareas.

- **Configuración**: Para cada agente (agent1, agent2, agent3), se debe configurar una conexión SSH que permita a Jenkins ejecutar comandos de manera remota. Esto requiere que los agentes estén configurados con una clave SSH compartida y que Jenkins tenga los permisos adecuados.
- **Ventaja**: Esta configuración permite que Jenkins ejecute tareas de manera distribuida y remota, lo que facilita la **escalabilidad** y la **flexibilidad**, ya que se pueden agregar o quitar agentes fácilmente.
- **Seguridad**: La comunicación a través de SSH es **segura** si se utiliza cifrado adecuado, pero también puede ser **más compleja** de administrar, especialmente cuando se tienen múltiples agentes.

B. Agentes basados en Java (Jenkins slave):

Otra opción es usar agentes que se conectan al master de Jenkins utilizando el protocolo Java Web Start o mediante un cliente Java.

- **Configuración**: Los agentes basados en Java se configuran descargando un archivo JAR desde el servidor maestro de Jenkins y ejecutándolo en el nodo esclavo.
- **Ventaja**: Esta configuración puede ser más sencilla para administrar si la infraestructura de Jenkins es completamente interna, ya que no requiere configuraciones adicionales de red o SSH.
- **Seguridad**: La **comunicación entre master y slave** en Jenkins es cifrada de forma predeterminada, lo que garantiza **seguridad**. Sin embargo, los agentes que se conectan con

el protocolo Java deben ser cuidadosamente monitoreados, ya que pueden ser más vulnerables a **fallos de seguridad** si no se mantienen actualizados.

3. Conclusiones en términos de seguridad y eficiencia:

A. Seguridad:

- **Aislamiento de tareas críticas**: Al utilizar **agentes diferentes** para tareas como seguridad (Bandit) y rendimiento (JMeter), se garantiza que cualquier vulnerabilidad o fallo en una de las etapas no afecte a las demás. Esto es especialmente importante si las pruebas de seguridad implican escaneos de código fuente o análisis de vulnerabilidades.
- **Control de acceso**: Puedes aplicar políticas de seguridad **más estrictas** a agentes que ejecutan pruebas de seguridad o pruebas de rendimiento, como restringir el acceso a recursos sensibles, controlar qué herramientas están disponibles, o asegurar que solo los usuarios autorizados puedan acceder a los agentes.
- **Reducción de riesgos**: Separar las tareas también reduce el riesgo de que un error en una etapa (por ejemplo, una vulnerabilidad en las pruebas de rendimiento) afecte a la estabilidad de las demás etapas del pipeline.

B. Eficiencia:

- **Paralelismo eficiente**: La configuración de **etapas paralelas** (como Static y Security) en diferentes agentes permite que el pipeline ejecute múltiples tareas al mismo tiempo, lo que acelera significativamente el proceso global.
- **Especialización**: Asignar agentes específicos para cada tipo de tarea (desarrollo, seguridad, rendimiento) mejora la eficiencia en cada una de las etapas, ya que cada agente puede estar optimizado para la tarea que realiza. Por ejemplo, el agente de rendimiento (agent3) puede tener más recursos disponibles para ejecutar pruebas de carga sin que afecte las demás tareas.

C. Escalabilidad:

- La infraestructura distribuida, donde diferentes agentes están configurados para diferentes tareas, facilita la **escalabilidad**. Si necesitas más capacidad de procesamiento para una etapa (por ejemplo, más agentes para pruebas de rendimiento), puedes agregar más **nodos de Jenkins** sin interrumpir las tareas que ya están en curso.

Conclusión Final:

Esta distribución de tareas en Jenkins, utilizando **agentes separados**, no solo mejora la **seguridad** al aislar tareas críticas y sensibles, sino que también optimiza la **eficiencia** y **escalabilidad** del pipeline. Utilizar **SSH** o **Java** para gestionar estos agentes depende de la infraestructura y necesidades específicas, pero ambas opciones pueden ser efectivas si se configuran y mantienen adecuadamente.

Reto 3 – Mejora de la cobertura

En este reto se solicitan 3 entregables:

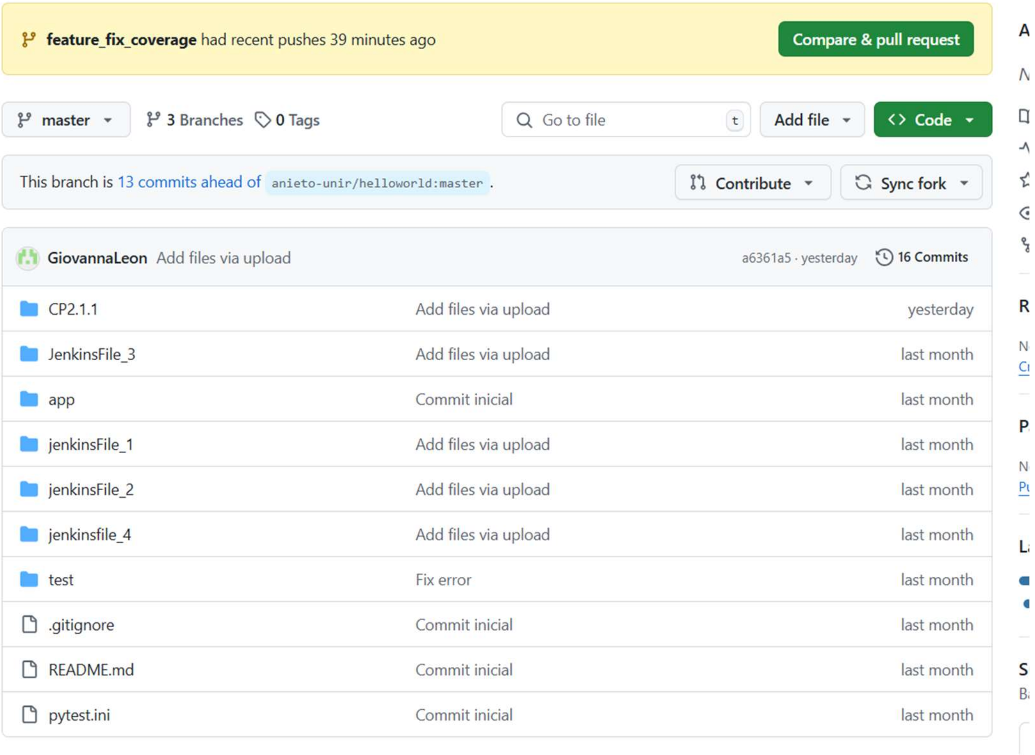
- URL al repositorio creado por el alumno, a partir del código fuente base de este CP1, que albergue tanto el código fuente como el nuevo Jenkinsfile.

https://github.com/GiovannaLeon/helloworld.git

El repositorio será el mismo, por lo que no es necesario indicar ninguna otra URL.

Hay que tener en cuenta que ahora tendremos una nueva rama en el repositorio “feature_fix_coverage”.

https://github.com/GiovannaLeon/helloworld/blob/master/CP2.1.1/JENKINSFILE_agentes_master.txt

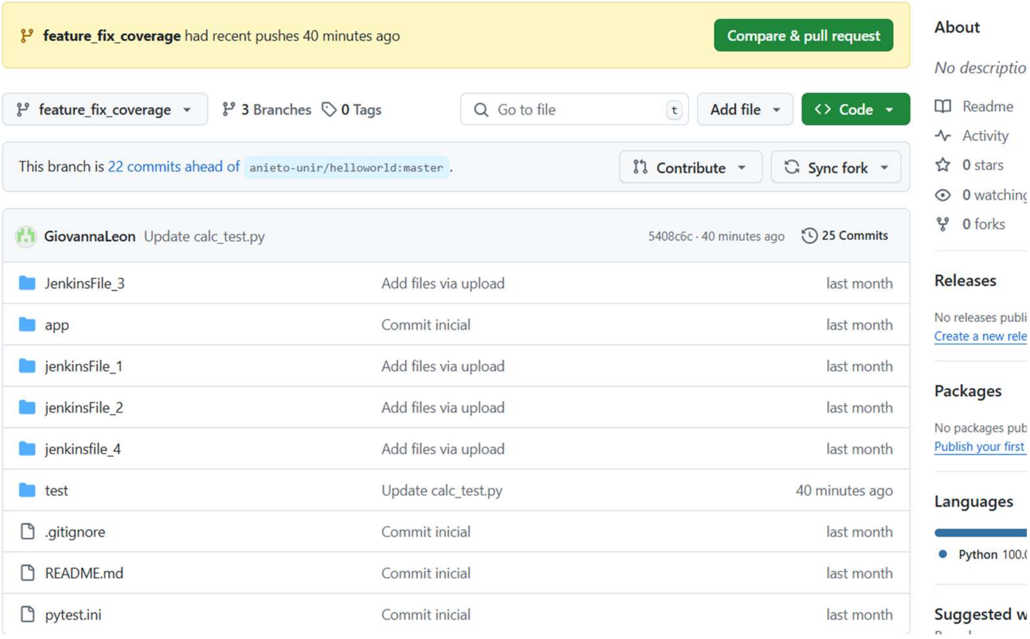


feature_fix_coverage had recent pushes 39 minutes ago

This branch is 13 commits ahead of `anieto-unir/helloworld:master` .

GiovannaLeon Add files via upload a6361a5 · yesterday 16 Commits

CP2.1.1	Add files via upload	yesterday
JenkinsFile_3	Add files via upload	last month
app	Commit inicial	last month
jenkinsFile_1	Add files via upload	last month
jenkinsFile_2	Add files via upload	last month
jenkinsfile_4	Add files via upload	last month
test	Fix error	last month
.gitignore	Commit inicial	last month
README.md	Commit inicial	last month
pytest.ini	Commit inicial	last month



feature_fix_coverage had recent pushes 40 minutes ago

This branch is 22 commits ahead of `anieto-unir/helloworld:master` .

GiovannaLeon Update calc_test.py — 5408c6c · 40 minutes ago — 25 Commits

JenkinsFile_3	Add files via upload	last month
app	Commit inicial	last month
jenkinsFile_1	Add files via upload	last month
jenkinsFile_2	Add files via upload	last month
jenkinsfile_4	Add files via upload	last month
test	Update calc_test.py	40 minutes ago
.gitignore	Commit inicial	last month
README.md	Commit inicial	last month
pytest.ini	Commit inicial	last month

- Log de ejecución del pipeline, sobre rama master, donde se muestren también los datos de cobertura de código por líneas y ramas (que no será cobertura completa).

```
Lanzada por el usuario Giovanna leon

[Pipeline] Start of Pipeline
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Get Code)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] git
The recommended git tool is: NONE
No credentials specified
Fetching changes from the remote Git repository
 > git.exe rev-parse --resolve-git-dir
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master\.git # timeout=10
 > git.exe config remote.origin.url https://github.com/GiovannaLeon/helloworld.git # timeout=10
Fetching upstream changes from https://github.com/GiovannaLeon/helloworld.git
 > git.exe --version # timeout=10
 > git --version # 'git version 2.47.1.windows.1'
 > git.exe fetch --tags --force --progress -- https://github.com/GiovannaLeon/helloworld.git +refs/heads/*:refs/remotes/origin/* # timeout=10
Checking out Revision a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 (refs/remotes/origin/master)
Commit message: "Add files via upload"
 > git.exe rev-parse "refs/remotes/origin/master^{commit}" # timeout=10
 > git.exe config core.sparsecheckout # timeout=10
 > git.exe checkout -f a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 # timeout=10
 > git.exe branch -a -v --no-abbrev # timeout=10
 > git.exe branch -D master # timeout=10
 > git.exe checkout -b master a6361a5a1b8b84333ac998b3d5e0995a8e0dbd70 # timeout=10
 > git.exe rev-list --no-walk eb8d8309fcd89b880e7bc330d180dfeceaf53b9a # timeout=10
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>git checkout master
Already on 'master'
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>dir
 El volumen de la unidad C es Windows
 El n£mero de serie del volumen es: 6475-04AA

 Directorio de C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master

25/01/2025  12:06    <DIR>          .
23/01/2025  16:51    <DIR>          ..
23/01/2025  17:04            53.248 .coverage
23/01/2025  16:51                40 .gitignore
23/01/2025  16:51    <DIR>          .pytest_cache
23/01/2025  16:51    <DIR>          app
23/01/2025  17:04             2.280 coverage.xml
25/01/2025  12:06    <DIR>          CP2.1.1
23/01/2025  17:04               500 flake8.out
23/01/2025  16:51    <DIR>          jenkinsFile_1
23/01/2025  16:51    <DIR>          jenkinsFile_2
23/01/2025  16:51    <DIR>          JenkinsFile_3
23/01/2025  16:51    <DIR>          jenkinsfile_4
23/01/2025  16:51               175 pytest.ini
23/01/2025  16:51               418 README.md
23/01/2025  17:04             1.401 result-unit.xml
23/01/2025  16:51    <DIR>          test
               7 archivos         58.062 bytes
              10 dirs  560.655.937.536 bytes libres
[Pipeline] echo
Workspace: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Unit)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] catchError
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>SET
PYTHONPATH=C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
```

```
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>C:\Users\amaro\AppData\Local\Pr
ograms\Python\Python313\Scripts\coverage.exe  run  --branch  --source=app  --omit=app\__init__.py,app\api.py  -m  pytest    --junitxml=result-
unit.xml test\unit
============================= test session starts =============================
platform win32 -- Python 3.13.0, pytest-8.3.4, pluggy-1.5.0
rootdir: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
configfile: pytest.ini
collected 10 items

test\unit\calc_test.py ........                                  [ 80%]
test\unit\util_test.py ..                                        [100%]

- generated xml file: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master\result-unit.xml
-
============================= 10 passed in 0.10s ==============================
[Pipeline] sleep
Sleeping for 5 Seg
[Pipeline] junit
Grabando resultados de tests
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Static and Security Analysis)
[Pipeline] parallel
[Pipeline] { (Branch: Static)
[Pipeline] { (Branch: Security)
[Pipeline] stage
[Pipeline] { (Static)
[Pipeline] stage
[Pipeline] { (Security)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] node
Running on agent2
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] {
[Pipeline] {
[Pipeline] bat
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] bat
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>C:\Users\amaro\AppData\Local\Pr
ograms\Python\Python313\Scripts\flake8.exe --exit-zero --format=pylint --exit-zero app  1>flake8.out

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master>C:\Users\amaro\AppData\Local\Pr
ograms\Python\Python313\Scripts\bandit.exe --exit-zero -r . -f custom -o bandit.out --msg-template "{abspath}:{line}: [{test_id}] {msg}"
[main]      INFO      profile include tests: None
[main]      INFO      profile exclude tests: None
[main]      INFO      cli include tests: None
[main]      INFO      cli exclude tests: None
[main]      INFO      running on Python 3.13.0
[custom]    INFO      Result written to file: bandit.out
[Pipeline] catchError
[Pipeline] {
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Bandit] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master'
that match the pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Skipping file 'bandit.out' because it's empty
[Bandit] Skipping post processing
[Bandit] No filter has been set, publishing all 0 issues
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_master'
that match the pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Skipping file 'bandit.out' because it's empty
[Bandit] Skipping post processing
[Bandit] No filter has been set, publishing all 0 issues
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Reference build recorder is not configured
[Bandit] No valid reference build found
[Bandit] All reported issues will be considered outstanding
[Bandit] Evaluating quality gates
[Bandit] -> All quality gates have been passed
[Bandit] -> Details for each quality gate:
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 0, Quality gate: 2,00)
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 0, Quality gate: 4,00)
[Bandit] Health report is disabled - skipping
[Bandit] Created analysis result for 0 issues (found 0 new issues, fixed 0 issues)
[Bandit] Attaching ResultAction with ID 'pylint' to build 'Unir/JENKINSFILE_agentes_master #9'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Flake8] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master'
that match the pattern '**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent1' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
```

```
[Flake8] Copying affected files to Jenkins' build folder
'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes_master\builds\9\files-with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Searching for all files in 'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master'
that match the pattern '**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent1' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder
'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes_master\builds\9\files-with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Reference build recorder is not configured
[Flake8] No valid reference build found
[Flake8] All reported issues will be considered outstanding
[Flake8] Evaluating quality gates
[Flake8] -> Some quality gates have been missed: overall result is UNSTABLE
[Flake8] -> Details for each quality gate:
[Flake8]    - [Total (any severity)]: ≪Inestable≫ - (Actual value: 9, Quality gate: 8,00)
[Flake8]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 9, Quality gate: 10,00)
[Flake8] Health report is disabled - skipping
[Flake8] Created analysis result for 9 issues (found 0 new issues, fixed 0 issues)
[Flake8] Attaching ResultAction with ID 'flake8' to build 'Unir/JENKINSFILE_agentes_master #9'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // parallel
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Coverage)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] bat
```

```
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_master>C:\Users\amaro\AppData\Local\Pr
ograms\Python\Python313\Scripts\coverage.exe xml
Wrote XML report to coverage.xml
[Pipeline] catchError
[Pipeline] {
[Pipeline] cobertura
[Cobertura] Skipping Cobertura coverage report as build was not SUCCESS or better ...

[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Performance)
[Pipeline] node
Running on agent3
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master>SET FLASK_APP=app\api.py

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master>start /B
C:\Users\amaro\AppData\Local\Programs\Python\Python313\python.exe -m flask run --host=0.0.0.0 --port=5000

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master>timeout /t 20 /nobreak  // Espera 10
segundos para asegurarse de que Flask estÃ© listo antes de correr las pruebas
ERROR: Sintaxis no v lida. La opci¢n predeterminada no est  permitida m s
de "1" veces.
Escriba "TIMEOUT /?" para su uso.

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master>C:\Users\amaro\Downloads\apach
e-jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter -n -t test\jmeter\flask.jmx -f -l flask.jtl
Usage: python -m flask run [OPTIONS]
Try 'python -m flask run --help' for help.

Error: Could not import 'api'.
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
Creating summariser <summary>
Created the tree successfully using test\jmeter\flask.jmx
Starting standalone test @ 2025 Jan 25 12:06:39 CET (1737803199381)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary =    200 in 00:00:01 =  225.0/s Avg:     1 Min:     1 Max:    19 Err:     0 (0.00%)
Tidying up ...    @ 2025 Jan 25 12:06:40 CET (1737803200343)
... end of run
[Pipeline] script
[Pipeline] {
[Pipeline] perfReport
Creating parser with percentiles:'0,50,90,95,100,' filterRegex:null
Performance: Recording JMeterCsv reports '**/flask.jtl'
Performance: JMeterCsv copying reports to master, files
'[C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_master\flask.jtl]'
Performance: JMeterCsv parsing local reports
'[C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes_master\builds\9\performance-reports\JMeterCSV\flask.jtl]'
Performance: Parsing report file 'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes_master\builds\9\performance-reports\JMeterCSV\flask.jtl' with filterRegex 'null'.
Performance: No threshold configured for making the test unstable
Performance: No threshold configured for making the test failure
Performance: File flask.jtl reported 0.0% of errors [SUCCESS]. Build status is: UNSTABLE
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] End of Pipeline
Finished: UNSTABLE
```

- Log de ejecución del pipeline, sobre la nueva rama "feature_fix_coverage", donde se muestren también los datos de cobertura de código por líneas y ramas, ahora ya con un 100% de cobertura.

https://github.com/GiovannaLeon/helloworld/blob/master/CP2.1.1/JENKINSFILE_agentes_feature_fix_coverage.txt

```
Lanzada por el usuario Giovanna leon

[Pipeline] Start of Pipeline
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Get Code)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>echo C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] git
The recommended git tool is: NONE
No credentials specified
Fetching changes from the remote Git repository
Checking out Revision 5408c6c0d7ec57cd1c5391bf5f2e6b9c1d5f43ab (refs/remotes/origin/feature_fix_coverage)
 > git.exe rev-parse --resolve-git-dir C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage\.git # timeout=10
 > git.exe config remote.origin.url https://github.com/GiovannaLeon/helloworld.git # timeout=10
Fetching upstream changes from https://github.com/GiovannaLeon/helloworld.git
```

```
 > git.exe --version # timeout=10
 > git --version # 'git version 2.47.1.windows.1'
 > git.exe fetch --tags --force --progress -- https://github.com/GiovannaLeon/helloworld.git +refs/heads/*:refs/remotes/origin/* # timeout=10
 > git.exe rev-parse "refs/remotes/origin/feature_fix_coverage^{commit}" # timeout=10
 > git.exe config core.sparsecheckout # timeout=10
Commit message: "Update calc_test.py"
 > git.exe checkout -f 5408c6c0d7ec57cd1c5391bf5f2e6b9c1d5f43ab # timeout=10
 > git.exe branch -a -v --no-abbrev # timeout=10
 > git.exe branch -D feature_fix_coverage # timeout=10
 > git.exe checkout -b feature_fix_coverage 5408c6c0d7ec57cd1c5391bf5f2e6b9c1d5f43ab # timeout=10
 > git.exe rev-list --no-walk 2175ef423cb0425c8e7cb63fe4e6f30cbc6a4e44 # timeout=10
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>dir
 El volumen de la unidad C es Windows
 El n£mero de serie del volumen es: 6475-04AA

 Directorio de C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage

25/01/2025  12:29    <DIR>          .
23/01/2025  16:51    <DIR>          ..
25/01/2025  12:29            53.248 .coverage
20/01/2025  23:58                40 .gitignore
20/01/2025  23:58    <DIR>          .pytest_cache
20/01/2025  23:58    <DIR>          app
25/01/2025  12:29             2.245 coverage.xml
25/01/2025  12:29               500 flake8.out
20/01/2025  23:58    <DIR>          jenkinsFile_1
20/01/2025  23:58    <DIR>          jenkinsFile_2
20/01/2025  23:58    <DIR>          JenkinsFile_3
20/01/2025  23:58    <DIR>          jenkinsfile_4
20/01/2025  23:58               175 pytest.ini
20/01/2025  23:58               418 README.md
25/01/2025  12:29             2.818 result-unit.xml
20/01/2025  23:58    <DIR>          test
               7 archivos         59.444 bytes
               9 dirs  560.655.790.080 bytes libres
[Pipeline] echo
Workspace: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Unit)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>hostname
Amaro
```

```
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] catchError
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>SET
PYTHONPATH=C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>C:\Users\amaro\App
Data\Local\Programs\Python\Python313\Scripts\coverage.exe run --branch --source=app --omit=app\__init__.py,app\api.py -m pytest --
junitxml=result-unit.xml test\unit
============================= test session starts =============================
platform win32 -- Python 3.13.0, pytest-8.3.4, pluggy-1.5.0
rootdir: C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
configfile: pytest.ini
collected 9 items

test\unit\calc_test.py .......                                    [ 77%]
test\unit\util_test.py ..                                         [100%]

- generated xml file:
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage\result-unit.xml -
============================== 9 passed in 0.13s ==============================
[Pipeline] sleep
Sleeping for 5 Seg
[Pipeline] junit
Grabando resultados de tests
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Static and Security Analysis)
[Pipeline] parallel
[Pipeline] { (Branch: Static)
[Pipeline] { (Branch: Security)
[Pipeline] stage
[Pipeline] { (Static)
[Pipeline] stage
[Pipeline] { (Security)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] node
Running on agent2
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] {
[Pipeline] {
[Pipeline] bat
[Pipeline] bat
```

```
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>C:\Users\amaro\App
Data\Local\Programs\Python\Python313\Scripts\flake8.exe --exit-zero --format=pylint --exit-zero app  1>flake8.out

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>C:\Users\amaro\App
Data\Local\Programs\Python\Python313\Scripts\bandit.exe --exit-zero -r . -f custom -o bandit.out --msg-template "{abspath}:{line}: [{test_id}]
{msg}"
[main]      INFO      profile include tests: None
[main]      INFO      profile exclude tests: None
[main]      INFO      cli include tests: None
[main]      INFO      cli exclude tests: None
[main]      INFO      running on Python 3.13.0
[custom]    INFO      Result written to file: bandit.out
[Pipeline] catchError
[Pipeline] {
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Bandit] Searching for all files in
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage' that match the
pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Skipping file 'bandit.out' because it's empty
[Bandit] Skipping post processing
[Bandit] No filter has been set, publishing all 0 issues
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Searching for all files in
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent2\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage' that match the
pattern '**/bandit.out'
[Bandit] Traversing of symbolic links: enabled
[Bandit] -> found 1 file
[Bandit] Skipping file 'bandit.out' because it's empty
[Bandit] Skipping post processing
[Bandit] No filter has been set, publishing all 0 issues
[Bandit] Repository miner is not configured, skipping repository mining
[Bandit] Reference build recorder is not configured
[Bandit] No valid reference build found
[Bandit] All reported issues will be considered outstanding
[Bandit] Evaluating quality gates
[Bandit] -> All quality gates have been passed
[Bandit] -> Details for each quality gate:
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 0, Quality gate: 2,00)
[Bandit]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 0, Quality gate: 4,00)
[Bandit] Health report is disabled - skipping
[Bandit] Created analysis result for 0 issues (found 0 new issues, fixed 0 issues)
[Bandit] Attaching ResultAction with ID 'pylint' to build 'Unir/JENKINSFILE_agentes_feature_fix_coverage #13'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] recordIssues
WARNING: Unknown parameter(s) found for class type 'io.jenkins.plugins.analysis.core.util.WarningsQualityGate': healthy
[Flake8] Searching for all files in
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage' that match the
pattern '**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent1' with source code encoding 'windows-1252'
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder
'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes_feature_fix_coverage\builds\13\files-with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Searching for all files in
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage' that match the
pattern '**/flake8.out'
[Flake8] Traversing of symbolic links: enabled
[Flake8] -> found 1 file
[Flake8] Successfully parsed file
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage\flake8.out
[Flake8] -> found 9 issues (skipped 0 duplicates)
[Flake8] Successfully processed file 'flake8.out'
[Flake8] Post processing issues on 'agent1' with source code encoding 'windows-1252'
```

```
[Flake8] Creating SCM blamer to obtain author and commit information for affected files
[Flake8] -> No blamer installed yet. You need to install the 'git-forensics' plugin to enable blaming for Git.
[Flake8] Resolving file names for all issues in workspace
'C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage'
[Flake8] -> resolved paths in source directory (2 found, 0 not found)
[Flake8] Resolving module names from module definitions (build.xml, pom.xml, or Manifest.mf files)
[Flake8] -> resolved module names for 9 issues
[Flake8] Resolving package names (or namespaces) by parsing the affected files
[Flake8] -> resolved package names of 2 affected files
[Flake8] No filter has been set, publishing all 9 issues
[Flake8] Creating fingerprints for all affected code blocks to track issues over different builds
[Flake8] -> created fingerprints for 9 issues (skipped 0 issues)
[Flake8] Copying affected files to Jenkins' build folder
'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes_feature_fix_coverage\builds\13\files-with-issues'
[Flake8] -> 2 copied, 0 not in workspace, 0 not-found, 0 with I/O error
[Flake8] Skipping cleaning of source code files in old builds
[Flake8] Repository miner is not configured, skipping repository mining
[Flake8] Reference build recorder is not configured
[Flake8] No valid reference build found
[Flake8] All reported issues will be considered outstanding
[Flake8] Evaluating quality gates
[Flake8] -> Some quality gates have been missed: overall result is UNSTABLE
[Flake8] -> Details for each quality gate:
[Flake8]    - [Total (any severity)]: ≪Inestable≫ - (Actual value: 9, Quality gate: 8,00)
[Flake8]    - [Total (any severity)]: ≪Correcto≫ - (Actual value: 9, Quality gate: 10,00)
[Flake8] Health report is disabled - skipping
[Flake8] Created analysis result for 9 issues (found 0 new issues, fixed 0 issues)
[Flake8] Attaching ResultAction with ID 'flake8' to build 'Unir/JENKINSFILE_agentes_feature_fix_coverage #13'.
[Checks API] No suitable checks publisher found.
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // parallel
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Coverage)
[Pipeline] node
Running on agent1
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] bat
```

```
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent1\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>C:\Users\amaro\App
Data\Local\Programs\Python\Python313\Scripts\coverage.exe xml
Wrote XML report to coverage.xml
[Pipeline] catchError
[Pipeline] {
[Pipeline] cobertura
[Cobertura] Skipping Cobertura coverage report as build was not SUCCESS or better ...

[Pipeline] }
[Pipeline] // catchError
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Performance)
[Pipeline] node
Running on agent3
 in C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] {
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>whoami
amaro\amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>hostname
Amaro
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>echo
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage
[Pipeline] bat

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>SET
FLASK_APP=app\api.py

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>start                    /B
C:\Users\amaro\AppData\Local\Programs\Python\Python313\python.exe -m flask run --host=0.0.0.0 --port=5000

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>timeout      /t      20
/nobreak  // Espera 20 segundos para asegurarse de que Flask estÃ© listo antes de correr las pruebas
ERROR: Sintaxis no v lida. La opci¢n predeterminada no est  permitida m s
de "1" veces.
Escriba "TIMEOUT /?" para su uso.

C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage>C:\Users\amaro\Do
wnloads\apache-jmeter-5.6.3\apache-jmeter-5.6.3\bin\jmeter -n -t test\jmeter\flask.jmx -f -l flask.jtl
Usage: python -m flask run [OPTIONS]
Try 'python -m flask run --help' for help.

Error: Could not import 'api'.
WARN StatusConsoleListener The use of package scanning to locate plugins is deprecated and will be removed in a future release
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Creating summariser <summary>
Created the tree successfully using test\jmeter\flask.jmx
```

```
Starting standalone test @ 2025 Jan 25 12:33:13 CET (1737804793513)
Waiting for possible Shutdown/StopTestNow/HeapDump/ThreadDump message on port 4445
summary =    200 in 00:00:01 =  225.2/s Avg:     1 Min:     1 Max:    18 Err:     0 (0.00%)
Tidying up ...    @ 2025 Jan 25 12:33:14 CET (1737804794471)
... end of run
[Pipeline] script
[Pipeline] {
[Pipeline] perfReport
Creating parser with percentiles:'0,50,90,95,100,' filterRegex:null
Performance: Recording JMeterCsv reports '**/flask.jtl'
Performance: JMeterCsv copying reports to master, files
'[C:\ProgramData\Jenkins\.jenkins\workspace\agents\agent3\workspace\Unir\JENKINSFILE_agentes_feature_fix_coverage\flask.jtl]'
Performance: JMeterCsv parsing local reports
'[C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes_feature_fix_coverage\builds\13\performance-
reports\JMeterCSV\flask.jtl]'
Performance: Parsing report file
'C:\ProgramData\Jenkins\.jenkins\jobs\Unir\jobs\JENKINSFILE_agentes_feature_fix_coverage\builds\13\performance-
reports\JMeterCSV\flask.jtl' with filterRegex 'null'.
Performance: No threshold configured for making the test unstable
Performance: No threshold configured for making the test failure
Performance: File flask.jtl reported 0.0% of errors [SUCCESS]. Build status is: UNSTABLE
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] End of Pipeline
Finished: UNSTABLE
```

- Explicación de cómo se ha hecho la mejora y por qué antes no se alcanzaba el 100% de cobertura.

1. Pruebas de la clase TestCalculate (Cálculos):

En los métodos de esta clase se realizan operaciones como la suma, la resta, la multiplicación, la división y la potenciación. Necesitamos asegurarnos de que todos los casos de excepciones y resultados posibles sean cubiertos.

- **Añadir más pruebas** para cubrir los casos en que el divisor es 0 en la división.
- **Agregar excepciones y otros valores no numéricos** en cada operación.

2. Pruebas de la clase TestUtil (Utilidades):

Para la función convert_to_number, además de los casos de valores válidos y errores con cadenas, también debemos cubrir valores adicionales que puedan ser convertidos a números, como los booleanos y los números en notación científica.

He tenido problemas a la vez que he agregado para la rama feature_fix_coverage , calc_ y util_ , no he alcanzado el 100% en calc, pero si en útil_rest.