TASK 3 : Secure Coding Review

Choose a programming language and application. Review the code for security vulnerabilities and provide recommendations for secure coding practices. Use tools like static code analyzers or manual code review.

Install Bandit – static analyzer tool for python

Command: pip install bandit

```
C:\WINDOWS\system32\cmd.

C:\Users\aparn>pip install bandit
Collecting bandit
  Obtaining dependency information for bandit from https://files.pythonhosted.org/packages/f5/b2/327fb8e5df44eec822bb19add844d03bd2f550a1c
4f21913d575cdff83cc/bandit-1.7.7-py3-none-any.whl.metadata
  Downloading bandit-1.7.7-py3-none-any.whl.metadata (5.9 kB)
Requirement already satisfied: PyYAML>=5.3.1 in c:\users\aparn\anaconda3\lib\site-packages (from bandit) (6.0)
Collecting stevedore>=1.20.0 (from bandit)
  Obtaining dependency information for stevedore>=1.20.0 from https://files.pythonhosted.org/packages/4b/68/e739fd061b0aba464bef8e8be48428
b2aabbfb3f2f8f2f8ca257363ee6b2/stevedore-5.1.0-py3-none-any.whl.metadata
  Downloading stevedore-5.1.0-py3-none-any.whl.metadata (2.2 kB)
Collecting rich (from bandit)
  Obtaining dependency information for rich from https://files.pythonhosted.org/packages/be/be/1520178fa01eabe014b16e72a952b9f900631142ccd
03dc36cf93e30c1ce/rich-13.7.0-py3-none-any.whl.metadata
  Downloading rich-13.7.0-py3-none-any.whl.metadata (18 kB)
Requirement already satisfied: colorama>=0.3.9 in c:\users\aparn\anaconda3\lib\site-packages (from bandit) (0.4.6)
Collecting pbr!=2.1.0,>=2.0.0 (from stevedore>=1.20.0->bandit)
  Obtaining dependency information for pbr!=2.1.0,>=2.0.0 from https://files.pythonhosted.org/packages/64/dd/171c9fb653591cf265bcc89c436ee
c75c9bde3dec921cc236fa71e5698df/pbr-6.0.0-py2.py3-none-any.whl.metadata
  Downloading pbr-6.0.0-py2.py3-none-any.whl.metadata (1.3 kB)
Requirement already satisfied: markdown-it-py>=2.2.0 in c:\users\aparn\anaconda3\lib\site-packages (from rich->bandit) (2.2.0)
Requirement already satisfied: pygments<3.0.0,>=2.13.0 in c:\users\aparn\anaconda3\lib\site-packages (from rich->bandit) (2.15.1)
Requirement already satisfied: mdurl~=0.1 in c:\users\aparn\anaconda3\lib\site-packages (from markdown-it-py>=2.2.0->rich->bandit) (0.1.0)

Downloading bandit-1.7.7-py3-none-any.whl (124 kB)
   ---------------------------------------- 124.2/124.2 kB 7.1 MB/s eta 0:00:00
Downloading stevedore-5.1.0-py3-none-any.whl (49 kB)
   ---------------------------------------- 49.6/49.6 kB 2.5 MB/s eta 0:00:00
Downloading rich-13.7.0-py3-none-any.whl (240 kB)
   ---------------------------------------- 240.6/240.6 kB 7.4 MB/s eta 0:00:00
Downloading pbr-6.0.0-py2.py3-none-any.whl (107 kB)
   ---------------------------------------- 107.5/107.5 kB 6.5 MB/s eta 0:00:00
Installing collected packages: pbr, stevedore, rich, bandit
Successfully installed bandit-1.7.7 pbr-6.0.0 rich-13.7.0 stevedore-5.1.0

C:\Users\aparn>
```

Syntax to rum bandit on a python code

bandit -r project_name -f html -o outputfile

-r → perform security analysis recursively

Project_name → name of the file

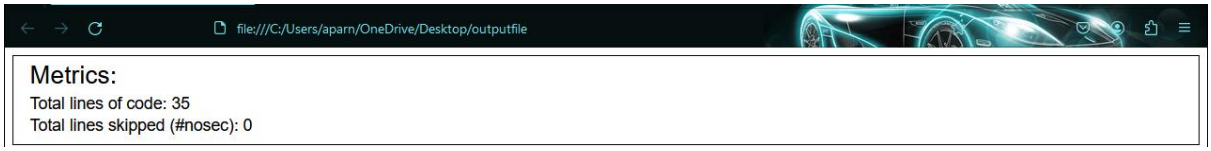
-f → type of output file, in this case it is html

-o → output file

Outputfile → name of output file

Lets perform for the folder name as 'try'

```
PS C:\Users\aparn\OneDrive\Desktop> bandit -r try -f html -o outputfile
[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 3.11.5
[html]  INFO    HTML output written to file: outputfile
PS C:\Users\aparn\OneDrive\Desktop>
```



Bandit allows you to output results in JSON format, providing more structured information. You can use the -f or --format option to specify the output format. For example:

bandit -r try -f json -o bandit_results.json

```
PS C:\Users\aparn\OneDrive\Desktop> bandit -r try -f json -o bandit_results.json
[main]  INFO    profile include tests: None
[main]  INFO    profile exclude tests: None
[main]  INFO    cli include tests: None
[main]  INFO    cli exclude tests: None
[json]  INFO    JSON output written to file: bandit_results.json
PS C:\Users\aparn\OneDrive\Desktop>
```

Here is the result:-


```
{
  "errors": [],
  "generated_at": "2024-02-01T15:54:44Z",
  "metrics": {
    "_totals": {
      "CONFIDENCE.HIGH": 0,
      "CONFIDENCE.LOW": 0,
      "CONFIDENCE.MEDIUM": 0,
      "CONFIDENCE.UNDEFINED": 0,
      "SEVERITY.HIGH": 0,
      "SEVERITY.LOW": 0,
      "SEVERITY.MEDIUM": 0,
      "SEVERITY.UNDEFINED": 0,
      "loc": 35,
      "nosec": 0,
      "skipped_tests": 0
    },
    "try\\index.py": {
      "CONFIDENCE.HIGH": 0,
      "CONFIDENCE.LOW": 0,
      "CONFIDENCE.MEDIUM": 0,
      "CONFIDENCE.UNDEFINED": 0,
      "SEVERITY.HIGH": 0,
      "SEVERITY.LOW": 0,
      "SEVERITY.MEDIUM": 0,
      "SEVERITY.UNDEFINED": 0,
      "loc": 35,
      "nosec": 0,
      "skipped_tests": 0
    }
  },
  "results": []
}
```

Verbose Output: The -v or --verbose option can be used to increase verbosity, providing more information about the analysis. For example:

bandit -r try -v

```
Windows PowerShell
PS C:\Users\aparn\OneDrive\Desktop> bandit -r try -v
[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 3.11.5
Run started:2024-02-01 15:58:26.539667
Files in scope (1):
        try\index.py (score: {SEVERITY: 0, CONFIDENCE: 0})
Files excluded (0):

Test results:
        No issues identified.

Code scanned:
        Total lines of code: 35
        Total lines skipped (#nosec): 0

Run metrics:
        Total issues (by severity):
                Undefined: 0
                Low: 0
                Medium: 0
                High: 0
        Total issues (by confidence):
                Undefined: 0
                Low: 0
                Medium: 0
                High: 0
Files skipped (0):
PS C:\Users\aparn\OneDrive\Desktop>
```