

IT314 - Software Engineering

Lab-5:- Static Analysis

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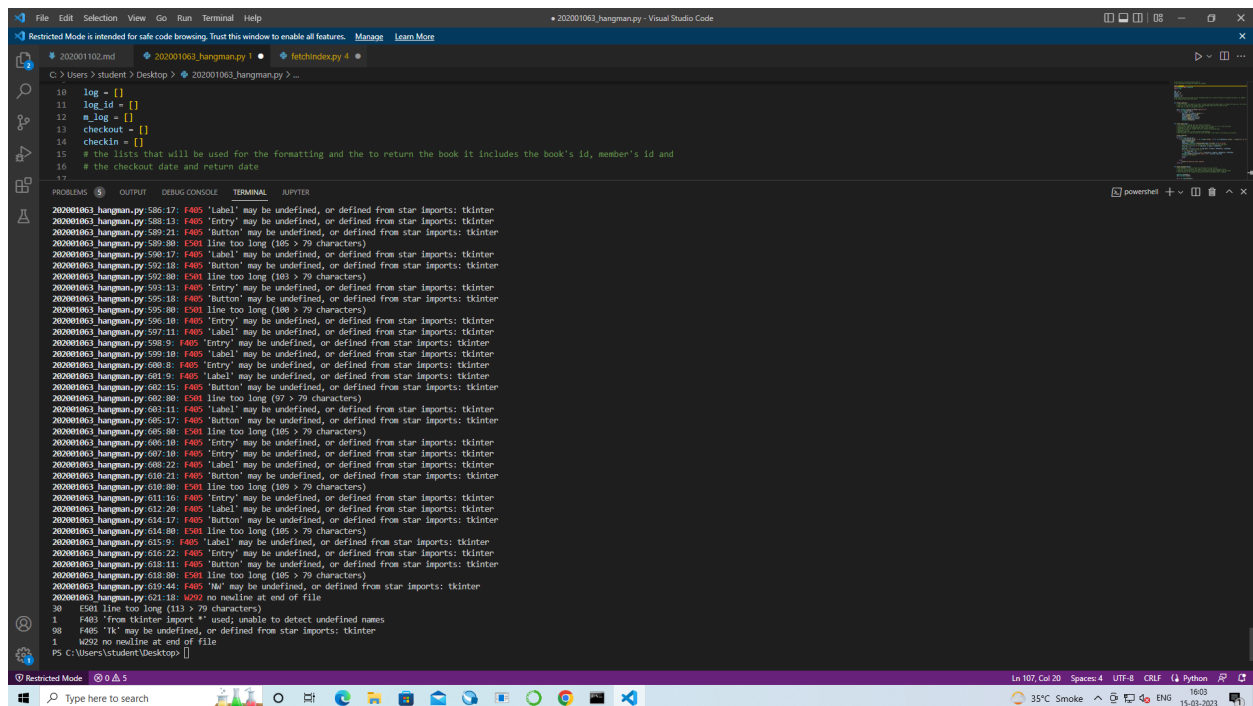
- Static Analysis:-

The Static Analysis is a method of checking the source codes of a software program or a project without executing it. Static Analysis helps us in detecting errors, bugs, vulnerabilities, and other quality issues in the code which might have been missed by the programmer at the first sight. Static analysis tools can perform various tasks such as checking syntax, style, logic, data flow, control flow, and security. Static analysis can improve the reliability, performance, and maintainability of software by identifying and correcting defects early in the development process.

- Static Analysis Tool:-

Here I'm using the "flake8" static analysis tool for the static analysis of the project files.

- Results of the Static Analysis Tool:-



```
File Edit Selection View Go Run Terminal Help
202001102.mcd 202001102_hangman.py 1 fetchindex.py 4
C:\Users\student\Desktop> 202001102_hangman.py > ...
10 log = []
11 log_id = []
12 # log = []
13 checkout = []
14 checkin = []
15 # the lists that will be used for the formatting and the to return the book it includes the book's id, member's id and
16 # the checkout date and return date
17

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL JUPYTER
202001102_hangman.py:585:17: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:588:13: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:589:21: F405 'Button' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:589:88: E501 line too long (105 > 79 characters)
202001102_hangman.py:598:17: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:592:18: F405 'Button' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:592:88: E501 line too long (103 > 79 characters)
202001102_hangman.py:593:13: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:595:18: F405 'Button' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:595:88: E501 line too long (100 > 79 characters)
202001102_hangman.py:599:10: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:597:11: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:598:9: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:599:10: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:600:8: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:601:9: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:602:15: F405 'Button' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:602:88: E501 line too long (97 > 79 characters)
202001102_hangman.py:603:11: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:605:17: F405 'Button' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:605:88: E501 line too long (105 > 79 characters)
202001102_hangman.py:606:10: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:607:10: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:608:22: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:610:21: F405 'Button' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:610:88: E501 line too long (109 > 79 characters)
202001102_hangman.py:611:16: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:612:20: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:614:17: F405 'Button' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:614:88: E501 line too long (105 > 79 characters)
202001102_hangman.py:615:9: F405 'Label' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:615:22: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:618:11: F405 'Button' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:618:88: E501 line too long (105 > 79 characters)
202001102_hangman.py:619:44: F405 'M' may be undefined, or defined from star imports: tkinter
202001102_hangman.py:621:18: M002 no newline at end of file
39 E501 line too long (113 > 79 characters)
1 F403 'from tkinter import *' used; unable to detect undefined names
98 F405 'tk' may be undefined, or defined from star imports: tkinter
1 M002 no newline at end of file
PS C:\Users\student\Desktop>
```

```

202001063_hangman.py:52:17: F405 'Frame' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:55:16: F405 'Label' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:64:8: F405 'Button' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:64:78: F405 'addBook' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:64:80: E501 line too long (85 > 79 characters)
202001063_hangman.py:67:8: F405 'Button' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:67:73: F405 'delete' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:70:8: F405 'Button' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:70:76: F405 'View' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:70:80: E501 line too long (80 > 79 characters)
202001063_hangman.py:73:8: F405 'Button' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:74:73: F405 'issueBook' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:74:80: E501 line too long (81 > 79 characters)
202001063_hangman.py:78:8: F405 'Button' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:78:73: F405 'returnBook' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
202001063_hangman.py:78:80: E501 line too long (83 > 79 characters)
202001063_hangman.py:81:16: W292 no newline at end of file
4 E501 line too long (85 > 79 characters)
3 F401 'tkinter.messagebox' imported but unused
6 F403 'from tkinter import *' used; unable to detect undefined names
15 F405 'Tk' may be undefined, or defined from star imports: AddBook, DeleteBook, IssueBook, ReturnBook, ViewBooks, tkinter
1 W292 no newline at end of file
PS C:\Users\student\Desktop>

```

```

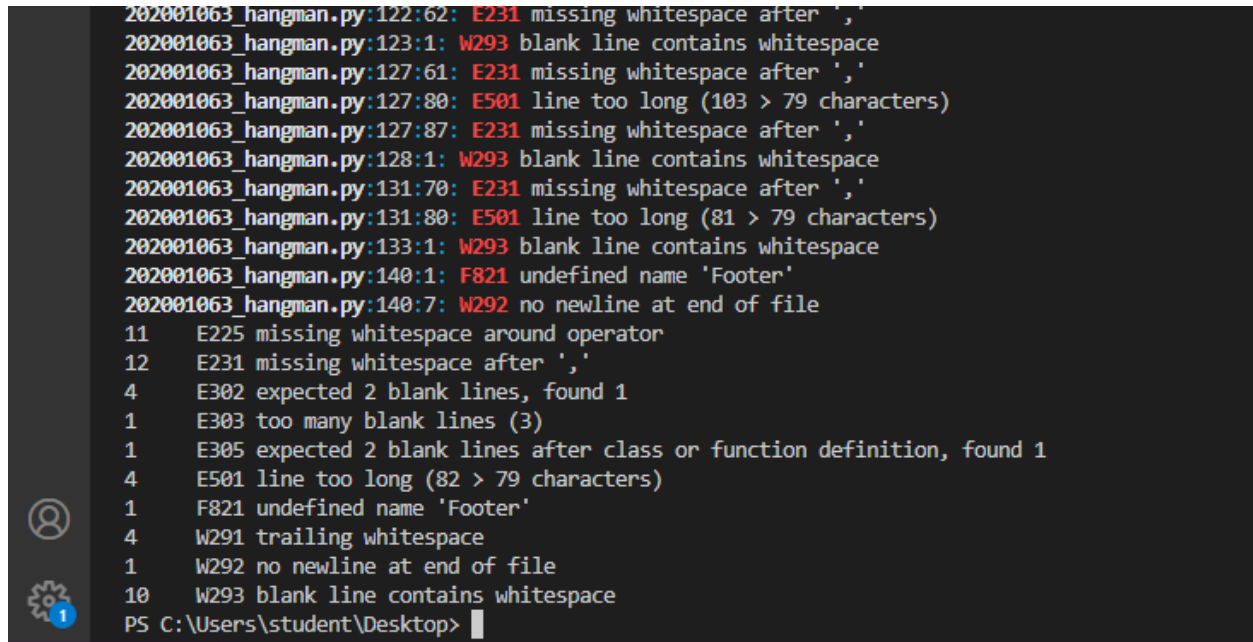
202001063_hangman.py:106:20: F405 'Label' may be undefined, or defined from star imports: tkinter
202001063_hangman.py:107:80: E501 line too long (86 > 79 characters)
202001063_hangman.py:111:18: F405 'Frame' may be undefined, or defined from star imports: tkinter
202001063_hangman.py:115:11: F405 'Label' may be undefined, or defined from star imports: tkinter
202001063_hangman.py:118:12: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001063_hangman.py:122:11: F405 'Label' may be undefined, or defined from star imports: tkinter
202001063_hangman.py:125:12: F405 'Entry' may be undefined, or defined from star imports: tkinter
202001063_hangman.py:129:16: F405 'Button' may be undefined, or defined from star imports: tkinter
202001063_hangman.py:129:80: E501 line too long (82 > 79 characters)
202001063_hangman.py:132:15: F405 'Button' may be undefined, or defined from star imports: tkinter
202001063_hangman.py:132:80: E501 line too long (87 > 79 characters)
202001063_hangman.py:135:20: W292 no newline at end of file
9 E501 line too long (80 > 79 characters)
1 E712 comparison to True should be 'if cond is True:' or 'if cond:'
2 E722 do not use bare 'except'
2 F401 'PIL.ImageTk' imported but unused
1 F403 'from tkinter import *' used; unable to detect undefined names
12 F405 'Tk' may be undefined, or defined from star imports: tkinter
1 F841 local variable 'show' is assigned to but never used
1 W292 no newline at end of file
PS C:\Users\student\Desktop>

```

● Types of Errors according to the tool:-

1. Module imported but not used.
2. Line too long:- when too much text is written in the same line
3. Local variable defined but not used
4. A file or a variable that is undefined in this file but might be imported or defined in some other file.
5. Errors related to formatting of the code such as no new line at the end of the file, too much whitespaces, not leaving enough lines between two section of code, etc.

Here is an example of the last mentioned type of error:-



```
202001063_hangman.py:122:62: E231 missing whitespace after ','
202001063_hangman.py:123:1: W293 blank line contains whitespace
202001063_hangman.py:127:61: E231 missing whitespace after ','
202001063_hangman.py:127:80: E501 line too long (103 > 79 characters)
202001063_hangman.py:127:87: E231 missing whitespace after ','
202001063_hangman.py:128:1: W293 blank line contains whitespace
202001063_hangman.py:131:70: E231 missing whitespace after ','
202001063_hangman.py:131:80: E501 line too long (81 > 79 characters)
202001063_hangman.py:133:1: W293 blank line contains whitespace
202001063_hangman.py:140:1: F821 undefined name 'Footer'
202001063_hangman.py:140:7: W292 no newline at end of file
11 E225 missing whitespace around operator
12 E231 missing whitespace after ','
4 E302 expected 2 blank lines, found 1
1 E303 too many blank lines (3)
1 E305 expected 2 blank lines after class or function definition, found 1
4 E501 line too long (82 > 79 characters)
1 F821 undefined name 'Footer'
4 W291 trailing whitespace
1 W292 no newline at end of file
10 W293 blank line contains whitespace
PS C:\Users\student\Desktop>
```

Also we can see in the images that every error has some specific error code displayed along with the description. The error code here displayed are:-

1. W - Warning :- This one is displayed when there are some specific python related problems.
2. E - Error :- This is displayed when there occurs an error on execution of a particular line of code.
3. F - Fatal :- This code is displayed when pylint doesn't have the access to further process the specific line of code.

There are two more errors which are not shown here in the images but can be displayed if the project code is such. These are:-

1. C - Convention :- This error is displayed when the code doesn't follow the standard rules of the code writing.
2. R - Refractor :- It is displayed for a bad code smell