ASSIGNMENT-9

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Lab9 :-

DocumentationGeneration–AutomaticDocumentationandCodeComments

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Problem 1

GivenPythonFunction

```
deffind_max(numbers):
    returnmax(numbers)
```

(a) DocstringDocumentation

```
deffind_max(numbers):

    Returnsthemaximumvaluefromalistofnumbers.

    Parameters:
    numbers(list):Alistofnumericvalues.

    Returns:
    intorfloat:Themaximumvalueinthelist. return

    max(numbers)
```

(b) InlineComments

```
deffind_max(numbers):
    #Findandreturnthemaximumvaluefromthelist
    return max(numbers)
```

(c) Google-StyleDocumentation

```
deffind_max(numbers):

      Findsthemaximumvalueinalistofnumbers.

  Args:
    numbers(list):Alistcontainingnumericvalues.

  Returns:
    intorfloat:Thelargestnumberinthelist. """
  returnmax(numbers)
```

CriticalComparison

- **Docstrings**providestructuredinternaldocumentationandareaccessibleusinghelp() and pydoc.
- **Inlinecomments**aresimplebutlimitedandunsuitablefordetailed explanations.
- **Google-styledocumentation**ishighlyreadable,standardized,andidealforlarge projects.

Recommendation

Foramathematicalutilitieslibrary,**Google-styledocumentation** ismosteffectiveduetoits clarity, consistency, and compatibility with documentation tools.

Problem 2

GivenPythonFunction

```
def login(user, password, credentials):
  returncredentials.get(user)==password
```

(a) DocstringDocumentation

```
deflogin(user,password,credentials):

  Verifies user login credentials.

  Parameters:
  user (str):
  Usernamepassword(str):User
  password
  credentials(dict):Dictionaryofstoredcredentials

  Returns:
  bool:Trueifloginissuccessful,Falseotherwise return
  credentials.get(user) == password
```

(b) InlineComments

```
deflogin(user,password,credentials):
```

```
    #Checkiftheenteredpasswordmatchesstoredcredentials
return credentials.get(user) == password
```

(c) Google-StyleDocumentation

```
deflogin(user,password,credentials):

    Authenticatesauserusingprovidedcredentials. Args:
        user(str):Usernameoftheuser.
        password(str):Passwordenteredbytheuser.
        credentials(dict):Dictionarymappinguserstopasswords.

    Returns:
        bool:Trueifauthenticationsucceeds,otherwiseFalse. return

    credentials.get(user) == password
```

ComparisonandRecommendation

Google-styledocumentationismosthelpfulfor**newdeveloperonboardingaproject** becauseitclearlyexplainsparameters,returnvalues,andintentinastandardizedformat.

Problem3–CalculatorModule

calculator.py

```
defadd(a,b):
    Returnsthesumoftwonumbers. return
    a + b


defsubtract(a, b):
    Returnsthedifferenceoftwonumbers. return
    a - b


defmultiply(a,b):
    Returnstheproductoftwonumbers.
    return a * b


defdivide(a,b):
    Returnsthequotientoftwonumbers.
    return a / b
```

DocumentationGeneration

- Terminaldocumentation:help(calculator)
- HTMLdocumentationgeneration:

```
pydoc-wcalculator
```

Thegenerated calculator.htmlfileisopened inawebbrowsertoverify documentation.

Problem4 –ConversionUtilities Module

conversion.py

```
defdecimal_to_binary(n):
   Convertsadecimalnumbertobinary.
   return bin(n)[2:]


defbinary_to_decimal(b):
   Convertsabinarynumbertodecimal.
   return int(b, 2)


defdecimal_to_hexadecimal(n):
   Convertsadecimalnumbertohexadecimal.
   return hex(n)[2:]
```

DocumentationGeneration

- Terminal:help(conversion)
- HTMLexportusing:

```
pydoc-wconversion
```

Problem5 –Course ManagementModule

course.py

```
courses={}

defadd_course(course_id,name,credits):
   Adds a new course to the course list.
   courses[course_id]={'name':name,'credits':credits}


def remove_course(course_id):
   RemovesacourseusingcourseID.
   courses.pop(course_id, None)
```

```
defget_course(course_id):
    RetrievescoursedetailsbycourseID.
    return courses.get(course_id)
```

DocumentationGeneration

- Terminaldocumentationusinghelp(course)
- HTMLdocumentationexportedusing:

```
pydoc-wcourse
```

ThegeneratedHTML fileisopened inabrowsertoverify correctness.

Conclusion

This lab demonstrates the importance of proper documentation in software development. Automaticdocumentationgenerationimprovesmaintainability,onboardingefficiency,and overall code quality. Google-style docstrings are recommended for professional and collaborative projects.