assignment02

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1 Assignment02

1.1 StudentID : 20155212

1.2 Name : Choi Bowon

1.3 Github : https://github.com/ChoiBowon/assignmnet02

1.3.1 1. Import packages numpy for calculating and matplotlib for drawing graph

```
In [87]: import numpy as np
         import matplotlib.pyplot as plt
```

1.3.2 2. Define f(x) = x * sinx as func(x)

```
In [88]: def func(x):
             f = np.sin(x)*x
             return f
```

1.3.3 3. Define f'(x) = sinx + x * cosx as derivatefunc(x)

```
In [89]: def derivatefunc(x):
             Df = np.sin(x) + np.cos(x) * x
             return Df
```

1.3.4 4. Pick 3 points in the domain using Array

```
In [82]: a_arr = [-3,0,3]
```

1.3.5 5. Define Taylor Approximation f(a) + f'(a)(x-a)

```
In [83]: def taylor(a,x):
             result = derivatefunc(a) * (x-a) + func(a)
             return result
```

1.3.6 6. Define Plot function include computing the graph

```
In [84]: def plot():
             x = np.arange(-7, 7, 0.1)
             f = func(x)
             Df = derivatefunc(x)
             Tf = taylor(a,x)
             plt.figure(1)
             plt.plot(x, f, 'b', label="function")
             plt.plot(x, Df, 'g', label = "derivatefunction")
             plt.plot(x, Tf, 'r', label = "Taylor expenssion")
```

1.3.7 7. Draw defined function graph and the graph for Taylor approximation for 3 points using for loop

```
In [85]: for a in a_arr:
                 plot()
```