Gradient Descent with Error

- Error = (y - y_hat)

```
import warnings
warnings.filterwarnings('ignore')
```

I. 함수 정의

1) Import numpy

```
import numpy as np
```

2) sigmoid( ) 함수 정의

```
def sigmoid(x):
    y_hat = 1 / (1 + np.exp(-x))
    return y_hat
```

2) 'x', 'y', 'w', 'b' 설정

- 'input', 'output' 정의
- 'w', 'b' 초기화

```
x = 0
y = 1

w = 0.9
b = 0.2
```

```
for i in range(1501):
    y_hat = sigmoid(x * w + b)
    error = y - y_hat

    w = w + x * 0.1 * error
    b = b + 1 * 0.1 * error

    if i % 100 == 0:
        print(i, error, y_hat)
```

```
0 0.45016600268752205 0.549833997312478
100 0.0973578803025189 0.9026421196974811
200 0.051001767235720585 0.9489982327642794
300 0.03423372766866506 0.9657662723313349
400 0.025687580437452562 0.9743124195625474
500 0.020529203797572282 0.9794707962024277
600 0.017084353843593636 0.9829156461564064
700 0.014623551944150437 0.9853764480558496
800 0.012779080847607371 0.9872209191523926
900 0.011345789149502794 0.9886542108504972
1000 0.010200317535153 38 0.9897996824648466
1100 0.009264083478147445 0.9907359165218526
1200 0.008484679807654327 0.9915153201923457
1300 0.007825826433493055 0.992174173566507
1400 0.007261616816515382 0.9927383831834846
1500 0.006773061510450762 0.9932269384895492
```

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The End

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