Simulation Scenario 구현

--- 11월 11일 Version

To Do check)

: Scenario (i)의 Data generating process가 $B \sim N(0,1)$, $C \sim N(0,1)$,

$E[Y^a | A=a, B=b, C=c] = \log 3 \times a + b + 0.5 \times C$

1) $E[Y^1] = \log 3 \times 1 + E[B] + 0.5 \times E[C] = \log 3 \times 1 + 0 + 0.5 \times 0 = \log 3$

2) $E[Y^0] = \log 3 \times 0 + E[B] + 0.5 \times E[C] = 0$

⇒ true ATE $= E[Y^1] - E[Y^0] = \log 3$

3) $E[Y^1 | A=1] = \log 3 \times 1 + E[B] + 0.5 \times E[C] = \log 3 \times 1 + 0 + 0.5 \times 0 = \log 3$

4) $E[Y^0 | A=1] = \log 3 \times 0 + E[B] + 0.5 \times E[C] = 0$

⇒ true ATT $= E[Y^1 | A=1] - E[Y^0 | A=1] = \log 3$

〈Result〉 : Exposure ratio 0.12에 대해, Scenario 1 대상

```
print(ATE_1_performance)
#                    Bias         rMSE Naive_var_coverage Sandwich_robust_var_coverage
#Outcome_reg -0.002312548 0.0008903680                0.00                          NA
#IPW         -0.002236175 0.0009083650                0.93                        0.12
#DR          -0.002116843 0.0008972224                0.06                        0.56
```

```
print(ATT_1_performance)
#                    Bias         rMSE Naive_var_coverage Sandwich_robust_var_coverage
#Outcome_reg -0.002312548 0.0008903680                0.00                          NA
#IPW         -0.002321659 0.0008881832                0.95                        0.21
#DR          -0.002342924 0.0008895551                0.00                        1.00
```