# 1. 변수 합치기(SUM)

| schema\_sub.excl 문서 참조

	변수명	변수유형	해당 변수
1	Bhouse	숙박	B1+B2+B3+B4+B5
2	Btraffic	이동 수단	B7+B8+B9+B10+B11
3	Bgoods	소비재	B13+B14+B15+B16+B17+B18+B19+B20+B21+B22+B23+B24+B25+ B26+B27+B28+B29+B30+B31+B32+B57+B58+B59+B60+B78+B79
4	Bonline	온라인결제	B33+B34
5	Bfood	식음료	B35+B36+B37+B38+B39+B40+B41+B42
6	Betc	기타	B6+B43+B44+B45+B46+B47+B48+B49+B50+B51+B124+B125+B12 6+B127+B128+B136+B152+B153+B154
7	Bfurniture	가구	B52+B53+B134
8	Bfee	통신 요금	B61+B62
9	Bcloth	의복	B63+B64+B65+B66+B67+B68+B69+B70+B71+B72+B73+B74+B75+ B76
10	Bcultural	문화생활	B80+B81+B82+B83+B84+B85+B86+B87+B88+B89+B91+B92+B93+ B95+B96+B121+B137+B138
11	Bactivity	액티브 레저	B90+B97+B98+B99+B100+B101+B102+B103+B104+B105+B120+B 123
12	Binsurance	보험	B106+B107
13	Bedu	교육	B94+B108+B122+B155+B156+B160
14	Bwedding	결혼	B109+B110+B111+B114+B115
15	Bfuneral	장례	B112+B116+B117
16	Bcar	차량	B118+B119+B133+B135+B157+B158+B159+B165+B166
17	Bpro	전문인력	B129+B130+B131+B132
18	Bdoc	의료계	B139+B140+B141+B142+B143+B144+B145+B146+B147+B148+B1
19	Bmanufactur	제조업	B150(금액_기계류제조업)+B151(금액_식품류제조업)
20	Boil	유류	B161+B162+B163+B164
21	Btax	세금공과금	B12
22	합침 제외		B54(중고품판매점), B55(사무기기), B56(정보통신기기_컴퓨터), B77(골동품_ 예술품), B113(수제용품점)
	Total		B1~B166

# SAS 시스템

#### The REG Procedure Model: MODEL1 Dependent Variable: B167

Number of Observations Read 473228 Number of Observations Used 473228

Analysis of Variance								
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F			
Model	26	2.790989E19	1.073457E18	94043.8	<.0001			
Error	473201	5.401326E18	1.141444E13					
Corrected Total	473227	3.331121E19						

Root MSE	3378527	R-Square	0.8379
Dependent Mean	2218141	Adj R-Sq	0.8378
Coeff Var	152.31342		

		Parameter	Estimates		
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr >  t
Intercept	1	1 48992	7382,70332	20.18	<.0001
Bhouse	1	1.11630	0.06676	16.72	<.0001
Btraffic	1	1.32501	0.03860	34.33	<.0001
Bgoods	1	1,12766	0.01055	106.89	<.0001
Bonline	1	1.43430	0.00698	205.52	<.0001
Bfood	1	1.00666	0.02015	49.96	<.0001
Betc	1	1.09097	0.01482	73.63	<.0001
Bfurniture	1	1.07247	0.06743	15.91	<.0001
Bfee	1	1.62743	0.04234	38,44	<.0001
Bcloth	1	1.22712	0.05136	23.89	<.0001
Bcultural	1	1.11343	0.04226	26.35	<.0001
Bactivity	1	1.00446	0.03530	28.46	<.0001
Binsurance	1	1.28454	0.02269	56.61	<.0001
Bedu	1	0.98684	0.02655	37.17	<.0001
Bwedding	1	1.79137	0.11031	16.24	<.0001
Bfuneral	1	2.15866	0.14330	15.06	<.0001
Bcar	1	1.76322	0.02621	67.27	<.0001
Bpro	1	1.50276	0.10283	14.61	<.0001
Bdoc	1	1.71401	0.00220	777.38	<.0001
Bmanufactur	1	1.91861	0.25541	7.51	<.0001
Boil	1	0.96330	0.01112	86.60	<.0001
Btax	1	1.21101	0.00102	1189.12	<.0001
B54	1	3,78258	0.93674	4.04	<.0001
B55	1	13,96880	1.95143	7.16	<.0001
B56	1	1.32949	0.17023	7.81	<.0001
B77	1	-0.05837	15.72018	-0.00	0.9970
B113	1	0.19000	1.64412	0.12	0.9080

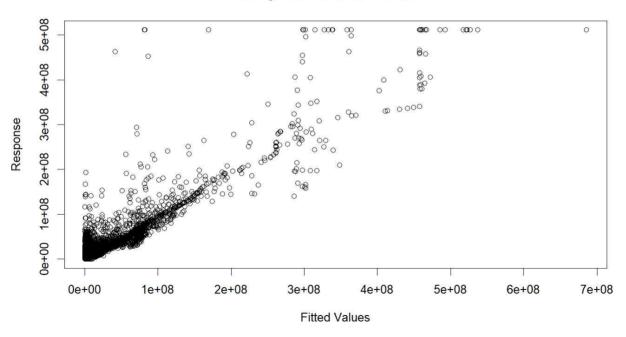
✓ 단순선형회귀모델 결과, GAM 결과와 유사한 결과 도출됨

# 2. 전체 데이터에 대해 합친 변수로 모델링한 결과(1차 모델)

```
Family: gaussian
Link function: identity
Formula:
B167 ~ s(Bhouse) + s(Btraffic) + s(Bgoods) + s(Bonline) + s(Bfood) +
     7 ~ s(Bhouse) + s(Btraffic) + s(Bgoods) + s(Bonline) + s(Bfood) +
s(Betc) + s(Bfurniture) + s(Bfee) + s(Bcloth) + s(Bcultural) +
s(Bactivity) + s(Binsurance) + s(Bedu) + s(Bwedding) + s(Bfuneral) +
s(Bcar) + s(Bpro) + s(Bdoc) + s(Bmanufactur) + s(Boil) +
s(Btax) + s(B54) + s(B55) + s(B56) + s(B77) + s(B113)
Parametric coefficients:
Estimate Std. Error t value Pr(>|t|) (Intercept) 2218141 4545 488 <2e-16 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
edf Ref.df F
                     7.787e+00
                                                            < 2e-16 ***
                                         9 6.070e+01
s(Bhouse)
                                          9 1.801e+02
s(Btraffic)
                     7.823e+00
                                                              2e-16 ***
                                                              2e-16 ***
s(Bgoods)
s(Bonline)
                     8.971e+00
7.991e+00
                                          9 1.665e+03
                                            6.279e+03
                                                              2e-16
                     8.766e+00
7.944e+00
                                         9 4.635e+02
9 7.350e+02
s(Bfood)
                                                              2e-16 ***
                                                              2e-16
s(Betc)
s(Bfurniture)
                     4.338e+00
                                          9 3.992e+01
                                                              2e-16 ***
                                                              2e-16 ***
s(Bfee)
                     6.450e+00
7.199e+00
                                          9 2.335e+02
s(Bcloth)
                       .199e+00
                                          9 9.336e+01
s(Bcultural)
s(Bactivity)
                     8.938e+00
7.304e+00
                                         9 1.507e+02
                                                              2e-16 ***
                       304e+00
                                          9 1.237e+02
                                                              2e-16
                                         9 4.386e+02
9 2.434e+02
s(Binsurance)
                       891e+00
                                                              2e-16 ***
                     8.960e+00
s (Bedu)
                                                              2e-16
                    5.611e+00
7.318e+00
s(Bwedding)
                                          9 3.835e+01
                                                              2e-16 ***
                                         9 3.405e+01
9 7.138e+02
s(Bfuneral)
                                                              2e-16
                       771e+00
s(Bcar)
                                                              2e-16 ***
                                         9 4.269e+01
9 7.911e+04
s(Bpro)
                     7.732e+00
s (Bdoc)
                     8.993e+00
                                                              2e-16 ***
                                                              2e-16 ***
s(Bmanufactur) 3.960e+00
                                          9 1.189e+01
s(Boil)
                     1.824e+00
                                          9 9.856e+02
                                                              2e-16
s(Btax)
                     9.000e+00
                                         9 1.840e+05
9 2.339e+00
                                                              2e-16 ***
s(B54)
                     1.826e+00
                                                           4.88e-06
                     4.670e+00
                                          9 1.616e+01
s(B56)
                     8.468e+00
                                          9 2.197e+01
                                                              2e-16
s(B77)
                                          9 0.000e+00
                                                              0.704
                     1.015e-05
s(B113)
                     5.703e-06
                                         9 0.000e+00
                                                              0.484
signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '1
R-sq.(adj) = 0.861 Deviance explained = 86.1%
GCV = 9.7792e+12 Scale est. = 9.7757e+12 n = 473228
```

- ✓ 본 모델은 데이터가 가우시안 분포를 따를 것이라 가정하고 모델링을 진행했으며, Link function에서 처음의 가정대로 적합되었음을 알 수 있다.
- ✓ B77(금액\_골동품\_예술품), B113(금액\_수제용품점)을 제외하고 전부 유의하게 나옴. → 이후 분석에서는 해당 변수들 제외하고 진행.
- ✓ B54(금액\_중고품판매점)역시 충분히 유의하지만, 상대적으로 유의도가 낮음.

#### Response vs. Fitted Values



## 3. 성별 데이터에 대해 1차 모델로 적합한 결과

## 1) Female Data

```
Family: gaussian
Link function: identity
Formula:
B167 ~ s(Bhouse) + s(Btraffic) + s(Bgoods) + s(Bonline) + s(Bfood) +
    s(Betc) + s(Bfurniture) + s(Bfee) + s(Bcloth) + s(Bcultural) +
    s(Bactivity) + s(Binsurance) + s(Bedu) + s(Bwedding) + s(Bfuneral) +
    s(Bcar) + s(Bpro) + s(Bdoc) + s(Bmanufactur) + s(Boil) +
    s(Btax) + s(B54) + s(B55) + s(B56) + s(B77) + s(B113)
Parametric coefficients:
            Estimate Std. Error t value Pr(>|t|)
                                         <2e-16 ***
(Intercept)
            2070203
                                  314.2
                           6589
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
                     edf Ref.df
                                        F p-value
               7.419e+00
                              9
                                   24.458 < 2e-16 ***
s(Bhouse)
                              9
                                  62.943 < 2e-16 ***
s(Btraffic)
               8.063e+00
s(Baoods)
               8.643e+00
                              9
                                  749.731 < 2e-16 ***
s(Bonline)
               8.961e+00
                              9 1948.340 < 2e-16 ***
                                  176.024 < 2e-16 ***
s (Bfood)
               8.516e+00
                              9
s(Betc)
               8.228e+00
                              9
                                 304.283 < 2e-16 ***
s(Bfurniture) 9.899e-01
                              9
                                  14.548 < 2e-16 ***
               7.167e+00
                              9
                                  128.576 < 2e-16 ***
s(Bfee)
                              9
                                   60.025 < 2e-16 ***
s(Bcloth)
               7.540e+00
                              9
                                   54.871 < 2e-16 ***
s(Bcultural)
              8.504e+00
                              9
                                   35.146 < 2e-16 ***
s(Bactivity)
              9.986e-01
s(Binsurance) 8.591e+00
                              9
                                  167.550 < 2e-16 ***
                              9
                                  143.915 < 2e-16 ***
s(Bedu)
               8.578e+00
               2.264e+00
                                   11.925 < 2e-16 ***
                             9
s(Bwedding)
                                   9.590 < 2e-16 ***
               7.542e+00
                             9
s(Bfuneral)
s(Bcar)
               8.885e+00
                              9
                                  173.546 < 2e-16 ***
               9.917e-01
                              9
                                   17.469 < 2e-16 ***
s(Bpro)
                              9 34023.814 < 2e-16 ***
               8.994e+00
s(Bdoc)
s(Bmanufactur) 2.938e+00
                              9
                                    6.683 < 2e-16 ***
                              9
s(Boil)
               6.039e+00
                                  177.034 < 2e-16 ***
               8.982e+00
                              9 66335.952 < 2e-16 ***
s(Btax)
s(B54)
               1.831e+00
                              9
                                    0.819 0.01304 *
                              9
s(B55)
               1.162e+00
                                    0.228 0.16671
                              9
                                    1.714 0.00645 **
               5.187e+00
s(B56)
s(B77)
               5.622e-05
                              9
                                    0.000 0.48341
               6.233e-05
                              9
                                    0.000 0.78981
s(B113)
signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
R-sq.(adj) = 0.832 Deviance explained = 83.2%
GCV = 9.52e+12 Scale est. = 9.5136e+12 n = 219138
✓ 유의수준을 0.05로 정하면, 개별 변수들은 상대적으로 유의하지 않음이 보다 명확하게 드러났다.
✓ 당연한 결과?
```

#### 2) Male Data

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(Bhouse) + s(Btraffic) + s(Bgoods) + s(Bonline) + s(Bfood) +
    s(Betc) + s(Bfurniture) + s(Bfee) + s(Bcloth) + s(Bcultural) +
    s(Bactivity) + s(Binsurance) + s(Bedu) + s(Bwedding) + s(Bfuneral) +
    s(Bcar) + s(Bpro) + s(Bdoc) + s(Bmanufactur) + s(Boil) +
    s(Btax) + s(B54) + s(B55) + s(B56) + s(B77) + s(B113)
Parametric coefficients:
            Estimate Std. Error t value Pr(>|t|)
                                  378.8 <2e-16 ***
(Intercept) 2345729
                           6192
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
                     edf Ref.df
                                        F p-value
                              9 3.876e+01 < 2e-16 ***
               8.6940246
s(Bhouse)
s(Btraffic)
                              9 1.255e+02 < 2e-16 ***
               7.4201416
                              9 9.415e+02 < 2e-16 ***
               8.9018725
s(Baoods)
s(Bonline)
               8.9845719
                              9 4.438e+03 < 2e-16 ***
                              9 2.969e+02 < 2e-16 ***
s(Bfood)
               8.7650523
               5.7612214
                              9 4.434e+02 < 2e-16 ***
s(Betc)
                              9 2.845e+01 < 2e-16 ***
s(Bfurniture)
               7.7022650
               4.9000554
                              9 1.124e+02 < 2e-16 ***
s(Bfee)
                              9 3.455e+01 < 2e-16 ***
s(Bcloth)
               7.8592241
s(Bcultural)
               8.7700865
                              9 9.697e+01 < 2e-16 ***
s(Bactivity)
               7.6278472
                              9 9.245e+01 < 2e-16 ***
                              9 2.722e+02 < 2e-16 ***
s(Binsurance) 8.9367416
                              9 1.152e+02 < 2e-16 ***
s(Bedu)
               8.9586365
                              9 2.670e+01 < 2e-16 ***
s(Bwedding)
               5.4042635
                              9 2.507e+01 < 2e-16 ***
s(Bfuneral)
               6.6083030
                              9 5.795e+02 < 2e-16 ***
s(Bcar)
               8.6978269
                              9 2.749e+01 < 2e-16 ***
               7.5273721
s(Bpro)
s(Bdoc)
               8.9875673
                              9 4.571e+04 < 2e-16 ***
                              9 6.299e+00 < 2e-16 ***
s(Bmanufactur) 3.4710842
                              9 8.036e+02 < 2e-16 ***
s(Boil)
               2.1546130
                              9 1.193e+05 < 2e-16 ***
               8.9995308
s(Btax)
                              9 1.486e+00 0.00021 ***
s(B54)
               1.2512267
                              9 2.274e+01 < 2e-16 ***
s(B55)
               8.1515962
                              9 2.888e+01 < 2e-16 ***
               8.5980557
s(B56)
               0.0001052
                              9 0.000e+00 0.97153
s(B77)
               1.1206657
                              9 1.550e-01 0.28284
s(B113)
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
R-sq.(adj) = 0.882 Deviance explained = 88.2\%
GCV = 9.7499e+12 Scale est. = 9.7432e+12 n = 254090
✓ 남성 데이터로 분석했을 땐 전체 데이터로 했을 때와 (유의도 측면에서) 유사한 결과가 나왔음.
```

# 4. 전체 데이터에 대해, 각 변수군 별 유의도 판단

# 1) 'Bhouse, 숙박' 그룹

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(B1) + s(B2) + s(B3) + s(B4) + s(B5)
Parametric coefficients:
           Estimate Std. Error t value Pr(>|t|)
(Intercept) 2218141
                         12176
                                182.2 <2e-16 ***
Signif. codes:
0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
       edf Ref.df
                        F p-value
                9 104.133 < 2e-16 ***
s(B1) 8.837
s(B2) 1.895
                9
                   2.195 1.15e-05 ***
                    1.524 0.000137 ***
s(B3) 1.197
                9
                9 23.137 < 2e-16 ***
s(B4) 6.899
               9 33.243 < 2e-16 ***
s(B5) 5.794
Signif. codes:
0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
R-sq.(adj) = 0.0033 Deviance explained = 0.335%
GCV = 7.0163e+13 Scale est. = 7.016e+13 n = 473228
```

- ✓ 모든 변수가 충분히 유의한 것으로 나타남.
- ✓ 변수의 수에 비해 데이터가 많아서 변수가 적은 모델은 이처럼 모두 유의하게 나올 가능성 높음(Btraffic, Bfood 그룹에서도 같은 현상 확인함)
- ✓ 변수의 수가 10개 이하인 모델은 구태여 분석하지 않음.

## 2) 'Bgoods, 소비재' 그룹

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(B13) + s(B14) + s(B15) + s(B16) + s(B17) + s(B18) +
    s(B19) + s(B20) + s(B21) + s(B22) + s(B23) + s(B24) + s(B25) +
    s(B26) + s(B27) + s(B28) + s(B29) + s(B30) + s(B31) + s(B32) +
    s(B57) + s(B58) + s(B59) + s(B60) + s(B78) + s(B79)
Parametric coefficients:
           Estimate Std. Error t value Pr(>|t|)
                                       <2e-16 ***
                                 186.1
            2218141
                         11921
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
            edf Ref.df
                              F p-value
s(B13) 8.8058301
                     9 271.745 < 2e-16 ***
s(B14) 0.4724838
                     9
                          0.101 0.164708
                     9
                         58.060 < 2e-16 ***
s(B15) 7.5147366
                         11.594 < 2e-16 ***
s(B16) 2.6005432
                     9
                         32.065 < 2e-16 ***
s(B17) 5.6472267
                     9
s(B18) 0.0004568
                         0.000 0.869202
                     9
s(B19) 7.6086001
                     9
                         16.996 < 2e-16 ***
s(B20) 7.7338388
                     9
                         88.901 < 2e-16 ***
                     9 21.704 < 2e-16 ***
s(B21) 8.7146701
s(B22) 3.1747683
                     9
                          1.822 0.000542 ***
s(B23) 0.0003489
                     9
                         0.000 0.562594
                     9
                          6.728 < 2e-16 ***
s(B24) 2.9525002
s(B25) 8.2875492
                         29.307 < 2e-16 ***
                     9
                         20.615 < 2e-16 ***
s(B26) 8.0149412
                     9
s(B27) 8.1049906
                     9 30.583 < 2e-16 ***
s(B28) 0.9641891
                     9
                          1.443 0.000176 ***
s(B29) 1.5086102
                     9
                          1.067 0.001436 **
s(B30) 8.7657132
                        48.157 < 2e-16 ***
                     9
                     9 1406.081 < 2e-16 ***
s(B31) 8.9759484
                     9
                         0.000 0.759111
s(B32) 0.0002717
s(B57) 8.0784616
                     9
                         34.938 < 2e-16 ***
                         36.552 < 2e-16 ***
s(B58) 6.8077175
                     9
                         60.853 < 2e-16 ***
s(B59) 7.4949817
                     9
s(B60) 0.9085619
                     9
                          1.094 0.000994 ***
s(B78) 0.7540388
                     9
                          0.350 0.040902 *
                     9
                         33.997 < 2e-16 ***
s(B79) 8.8968362
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
                      Deviance explained = 4.49%
R-sq.(adj) = 0.0446
GCV = 6.727e+13 Scale est. = 6.7251e+13 n = 473228
```

<sup>✓</sup> 유의하지 않은 변수: B14(금액\_쇼핑센타), B18(금액\_대량양판점), B23(금액\_농수축협직판장), B32(금액\_ 수입상품점), B78(금액 관광민예 선물용품), B79(금액 화방)

		Paramete	r Estimates	6	
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > [t]
Intercept	1	1 486023	16287	91.24	<.0001
B13	1	1.74370	0.03621	48.15	<.0001
B14	1	1.47393	1.17822	1.25	0.2109
B15	1	1.17848	0.05812	20.28	<.0001
B16	1	1.53025	0.14794	10.34	<.0001
B17	1	2.72074	0.16835	16,16	<.0001
B18	1	2.38628	6.86110	0.35	0.7280
B19	1	3.71096	0.37505	9.89	<.0001
B20	1	4.05521	0.17549	23.11	<.0001
B21	1	4.89595	0.41358	11.84	<.0001
B22	1	2.21394	0.84837	2.61	0.0091
B23	1	-2.62764	3,59902	-0.73	0.4653
B24	1	1.45389	0.22571	6.44	<.0001
B25	1	2.72954	0.22419	12.18	<.0001
B26	1	8.16063	0.80513	10.14	<.0001
B27	1	2.39143	0.19856	12.04	<.0001
B28	1	2.99095	0.86472	3.46	0.0005
B29	1	2.02137	0.70516	2.87	0.0042
B30	1	11.61945	0.67820	17.13	<.0001
B31	1	41.50429	0.37699	110.09	<.0001
B32	1	6,94930	18.71250	0.37	0.7104
B57	1	18.56912	1.16552	15.93	<.0001
B58	1	1.80297	0.10703	16.85	<.0001
B59	1	153,35204	7.30330	21.00	<.0001
B60	1	6.06403	1.83251	3.31	0.0009
B78	1	4.38741	2.17451	2.02	0.0436
B79	1	72.91102	29.00637	2.51	0.0120

 <sup>✔</sup> 유의하지 않은 변수: B14(금액\_쇼핑센타), B18(금액\_대량양판점), B22(금액\_농가공산품), B23(금액\_농수 축협직판장), B28(금액\_농기계\_사료\_비료), B29(금액\_농협기타), B32(금액\_수입상품점), B60(금액\_교육기 자재), B78(금액\_관광민예\_선물용품), B79(금액\_화방) || 유의수준: 0.0001

<sup>✓</sup> 유의 수준을 GAM에서와 같이 0.05로 설정하면 동일한 결과가 도출됨.

## 3) 'Bfood, 식음료' 그룹

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(B35) + s(B36) + s(B37) + s(B38) + s(B39) + s(B40) +
    s(B41) + s(B42)
Parametric coefficients:
           Estimate Std. Error t value Pr(>|t|)
           2218141
                         12097 183.4 <2e-16 ***
(Intercept)
Signif. codes:
0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
        edf Ref.df
                         F p-value
s(B35) 8.946
                 9 424.105
                           < 2e-16 ***
                 9 25.273 < 2e-16 ***
s(B36) 7.450
s(B37) 8.586
                    24.538 < 2e-16 ***
                 9
                    9.420 < 2e-16 ***
s(B38) 2.480
                 9
s(B39) 3.851
                 9
                     2.911 1.17e-05 ***
s(B40) 7.824
                   22.240 < 2e-16 ***
                 9
s(B41) 8.164
                 9 42.965 < 2e-16 ***
s(B42) 7.896
                 9 18.394 < 2e-16 ***
Signif. codes:
0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
R-sq.(adj) = 0.0162 Deviance explained = 1.63%
GCV = 6.9259e+13 Scale est. = 6.9251e+13 n = 473228
```

✓ 모든 변수가 충분히 유의한 것으로 나타남.

## 4) 'Betc, 기타' 그룹

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(B6) + s(B43) + s(B44) + s(B44) + s(B45) + s(B46) + s(B47) +
    s(B48) + s(B49) + s(B50) + s(B51) + s(B124) + s(B125) + s(B126) +
    s(B127) + s(B128) + s(B136) + s(B152) + s(B153) + s(B154)
Parametric coefficients:
           Estimate Std. Error t value Pr(>|t|)
(Intercept) 2218141
                         12152
                                 182.5 <2e-16 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
              edf Ref.df
                          2.395 2.02e-05 ***
        2.544e+00
                      9
s(B6)
                          6.144 < 2e-16 ***
s(B43)
       8.462e+00
                      9
                      9
                         3.765 4.11e-06 ***
s(B44)
       6.905e+00
                      9 34.229 < 2e-16 ***
s(B45)
       5.982e+00
                         0.353
                                  0.0566 .
s(B46)
       1.015e+00
                      9
       3.731e-06
                      9
                          0.000
                                 0.5676
s(B47)
s(B48)
       6.390e+00
                      9 108.241 < 2e-16 ***
                      9 14.434 < 2e-16 ***
s(B49) 6.333e+00
s(B50) 8.604e+00
                      9 11.968 < 2e-16 ***
s(B51) 2.958e-06
                      9
                          0.000
                                 0.7204
                      9
                         9.575 < 2e-16 ***
s(B124) 5.584e+00
s(B125) 4.098e-06
                      9 0.000
                                 0.5245
                      9 23.977 < 2e-16 ***
s(B126) 5.505e+00
s(B127) 8.906e+00
                      9 47.663 < 2e-16 ***
                      9
                         5.392 < 2e-16 ***
s(B128) 3.467e+00
s(B136) 7.960e+00
                      9 23.661 < 2e-16 ***
s(B152) 4.143e+00
                      9 40.700 < 2e-16 ***
                         2.273 6.97e-06 ***
s(B153) 1.366e+00
                      9
                      9
                         2.592 5.99e-06 ***
s(B154) 2.506e+00
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
R-sq.(adj) = 0.0072 Deviance explained = 0.738%
GCV = 6.9898e+13 Scale est. = 6.9885e+13 n = 473228
```

✓ 유의하지 않은 변수: B46(금액\_페인트), B47(금액\_유리\_액자\_거울), B51(금액\_자동판매기), B125(금액\_ 보관\_창고업)

Parameter Estimates							
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > [t]		
Intercept	1	2052537	12857	159.64	<.000		
B6	1	5.20544	1.29550	4.02	<.000		
B43	1	4.54600	1.03813	4.38	<.000		
B44	1	3,42606	0.62628	5.47	<.000		
B45	1	1.99629	0.12962	15.40	<.000		
B46	1	3.08881	1.23648	2.50	0.012		
B47	1	5,58172	6.12461	0.91	0.362		
B48	1	1.19024	0.03975	29,95	<.000		
B49	1	4.11142	0.52238	7.87	<.000		
B50	1	3,94068	0.54468	7.23	<.000		
B51	1	2.76180	4.81708	0.57	0.566		
B124	1	8.37377	0.92750	9.03	<.000		
B125	1	27.98254	31.21558	0,90	0.370		
B126	1	12.49496	0.91414	13.67	<.000		
B127	1	7.78866	0.47886	16.27	<.000		
B128	1	12.32862	3,47608	3.55	0.0004		
B136	1	20.04814	1.40825	14.24	<.000		
B152	1	5.51820	0.29605	18.64	<.000		
B153	1	3.13271	0.68826	4.55	<.000		
B154	1	5.96722	1.25445	4.76	<.000		

<sup>✓</sup> 유의하지 않은 변수: B46(금액\_페인트), B47(금액\_유리\_액자\_거울), B51(금액\_자동판매기), B125(금액\_ 보관\_창고업), B128(금액\_열쇠\_도장)

<sup>✓</sup> 유의 수준을 GAM에서와 같이 0.05로 설정하면 동일한 결과가 도출됨.

#### 5) 'Bcloth, 의복' 그룹

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(B63) + s(B64) + s(B65) + s(B66) + s(B67) + s(B68) +
    s(B69) + s(B70) + s(B71) + s(B72) + s(B73) + s(B74) + s(B75) +
    s(B76)
Parametric coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 2218141
                         12189
                                  182 <2e-16 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
             edf Ref.df
                            F p-value
s(B63) 2.605e+00
                     9 46.970 < 2e-16 ***
s(B64) 1.010e-07
                     9 0.000 0.438906
                     9
                        0.031 0.257588
s(B65) 2.152e-01
s(B66) 8.302e-01
                     9 0.586 0.011698 *
                     9 1.393 0.000225 ***
s(B67) 9.214e-01
s(B68) 9.356e-01
                     9 1.747 4.14e-05 ***
s(B69) 9.879e-08
                     9 0.000 0.453872
                     9 0.000 0.544462
s(B70) 7.592e-08
s(B71) 4.822e-08
                     9 0.000 0.845216
s(B72) 2.147e+00
                     9 2.230 2.29e-05 ***
                     9 0.573 0.012545 *
s(B73) 8.277e-01
s(B74) 6.524e-01
                     9 0.209 0.089167 .
s(B75) 9.491e-01
                     9 2.191 6.05e-06 ***
s(B76) 2.737e+00
                     9 3.004 < 2e-16 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
R-sq.(adj) = 0.0012 Deviance explained = 0.122%
GCV = 7.031e+13 Scale est. = 7.0307e+13 n = 473228
```

✓ 유의하지 않은 변수: B64(금액\_양복), B65(금액\_양품점), B66(금액\_내의류판매업), B69(금액\_옷감\_직물 류), B70(금액 캐주얼의류), B71(금액 제화점), B73(금액 기성화 신발), B74(금액 시계점)

Parameter Estimates								
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > [t]			
Intercept	1	2162828	12445	173.80	<.0001			
B63	1	2.91811	0.14278	20.44	<.0001			
B64	1	4.29967	5.10086	0.84	0.3993			
B65	1	17.80130	15.54619	1.15	0.2522			
B66	1	3.84352	1.47515	2.61	0.0092			
B67	1	3.82025	1.03527	3.69	0.0002			
B68	1	8,79038	2.12475	4.14	<.0001			
B69	1	4.80924	6.03490	0.80	0.4255			
B70	1	9,20294	13,49882	0.68	0,4954			
B71	1	-4.04360	13.53567	-0.30	0.7651			
B72	1	6,45864	1.67451	3.86	0,0001			
B73	1	3,76431	1.45514	2,59	0,0097			
B74	1	2.50218	1.47277	1.70	0.0893			
B75	1	1.79206	0.39221	4.57	<.0001			
B76	1	3.88331	0.87269	4.45	<.0001			

- ✓ 유의하지 않은 변수: B64(금액\_양복), B65(금액\_양품점), B66(금액\_내의류판매업), B67(금액\_침구이불), B69(금액\_옷감\_직물류), B70(금액\_캐주얼의류), B71(금액\_제화점), B72(금액\_가방\_핸드백\_가죽), B73(금액\_기성화\_신발), B74(금액\_시계점)
- ✓ 유의 수준을 GAM에서와 같이 0.05로 설정하면 동일한 결과가 도출됨.

## 6) 'Bcultural, 문화생활' 그룹

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(B80) + s(B81) + s(B82) + s(B83) + s(B84) + s(B85) +
    s(B86) + s(B87) + s(B88) + s(B89) + s(B91) + s(B92) + s(B93) +
    s(B95) + s(B96) + s(B121) + s(B137) + s(B138)
Parametric coefficients:
           Estimate Std. Error t value Pr(>|t|)
(Intercept) 2218141
                         12140
                                 182.7
                                       <2e-16 ***
signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '1
Approximate significance of smooth terms:
             edf Ref.df
                              F p-value
s(B80)
       0.0000058
                      9
                          0.000 0.380421
                      9
                         5.687 < 2e-16 ***
s(B81)
       7.8221876
                      9 12.025 < 2e-16 ***
s(B82)
       3.9773758
                      9
                         1.163 0.009667 **
s(B83)
       3.0118917
                      9
                         11.915 < 2e-16 ***
s(B84)
       3.2929740
       0.8137358
                      9
                         0.447 0.026197 *
s(B85)
s(B86)
       1.7253787
                      9 1.384 0.000516 ***
       0.7643087
                      9 0.369 0.037010 *
s(B87)
                          3.780 < 2e-16 ***
                      9
s(B88)
       1.8229575
s(B89)
       3.4926034
                      9 38.277 < 2e-16 ***
                      9 34.725 < 2e-16 ***
       5.2706057
s(B91)
                      9 52.797 < 2e-16 ***
s(B92)
       8.4309256
                      9 39.829 < 2e-16 ***
       8.5005301
s(B93)
s(B95) 8.9755020
                      9 81.740 < 2e-16 ***
                      9 164.764 < 2e-16 ***
s(B96) 8.9278454
s(B121) 3.4326875
                      9
                          6.860 < 2e-16 ***
                      9
s(B137) 0.2449054
                          0.038 0.232056
s(B138) 3.4531656
                      9
                          1.698 0.001256 **
signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' '1
R-sq.(adj) = 0.00915
                     Deviance explained = 0.93\%
GCV = 6.9759e+13 Scale est. = 6.9748e+13 n = 473228
```

✓ 유의하지 않은 변수: B80(금액\_사진기\_광학제품), B83(금액\_수족관), B85(금액\_동물농장), B87(금액\_악 기), B137(금액\_전자오락실)

	Parameter Estimates							
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > [t]			
Intercept	1	2054409	12789	160.64	<.0001			
B80	1	8,79853	7.86897	1.12	0,2635			
B81	1	2.91875	0,50283	5.80	<.0001			
B82	1	7.34092	0.74474	9.86	<.0001			
B83	1	10.30845	3,43677	3.00	0.0027			
B84	1	4.09628	0.44242	9.26	<.0001			
B85	1	21.96051	9.06531	2.42	0.0154			
B86	1	12.04690	3,42070	3.52	0.0004			
B87	1	6.82518	3.01821	2.26	0.0237			
B88	1	8,73958	1.51805	5.76	<.0001			
B89	1	2.91051	0.15964	18.23	<.0001			
B91	1	6,42668	0.52173	12.32	<.0001			
B92	1	19.05688	1.06832	17.84	<.0001			
B93	1	8.67444	0.53862	16.10	<.0001			
B95	1	6.29740	0.27477	22.92	<.0001			
B96	1	9,69483	0.25639	37.81	<.0001			
B121	1	5.64405	0.72895	7.74	<.0001			
B137	1	31.67596	24.61078	1.29	0.1981			
B138	1	-2.02998	1.26091	-1.61	0.1074			

<sup>✔</sup> 유의하지 않은 변수: B80(금액\_사진기\_광학제품), B83(금액\_수족관), B85(금액\_동물농장), B86(금액\_음 반테이프), B87(금액\_악기), B137(금액\_전자오락실), B138(금액\_PC게임방)

<sup>✓</sup> 유의 수준을 GAM에서와 같이 0.05로 설정하면 동일한 결과가 도출됨.

## 7) 'Bactivity, 문화생활\_액티브레저' 그룹

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(B90) + s(B97) + s(B98) + s(B99) + s(B100) + s(B101) +
    s(B102) + s(B103) + s(B104) + s(B105) + s(B120) + s(B123)
Parametric coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 2218141
                          12169
                                 182.3
                                         <2e-16 ***
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
              edf Ref.df
                               F
                                 p-value
                                  < 2e-16 ***
s(B90) 2.501e+00
                           5.900
                          4.060
                                 < 2e-16 ***
s(B97)
       9.708e-01
                       9
s(B98)
       8.488e+00
                       9 145.447
                                  < 2e-16 ***
                                  < 2e-16 ***
s(B99)
                          4.770
       7.872e+00
s(B100) 7.425e-01
                           0.332
                                   0.0447 *
s(B101) 2.092e-06
                           0.000
                                  0.4091
                                  < 2e-16 ***
s(B102) 9.651e-01
                           3.097
s(B103) 3.375e-06
                          0.000
                                  0.7892
                           2.936 2.48e-07 ***
s(B104) 1.780e+00
s(B105) 5.492e+00
                       9
                          10.091 < 2e-16 ***
                                  < 2e-16 ***
s(B120) 1.905e+00
                       9
                          27.387
                           3.265 < 2e-16 ***
s(B123) 1.722e+00
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
R-sq.(adj) = 0.00443
                       Deviance explained = 0.45%
GCV = 7.0085e+13 Scale est. = 7.008e+13 n = 473228
```

✓ 유의하지 않은 변수: B100(금액 볼링장), B101(금액 스키장), B103(금액 당구장)

Parameter Estimates							
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr >  t		
Intercept	1	2103375	12593	167.02	<.0001		
B90	1	6.89550	1.02585	6.72	<.0001		
B97	1	3.83337	0.52110	7.36	<.0001		
B98	1	4.25919	0.12213	34.88	<.0001		
B99	1	5,75735	2.26402	2.54	0.0110		
B100	1	3,79636	1.84389	2.06	0.0395		
B101	1	5.02729	5.11266	0.98	0.3255		
B102	1	6,26268	1.16405	5.38	<.0001		
B103	1	0.68860	1.95754	0.35	0.7250		
B104	1	2.01180	0.40188	5.01	<.0001		
B105	1	10.34067	1.12919	9.16	<.0001		
B120	1	2.46333	0.15513	15.88	<.0001		
B123	1	14.01299	2.61243	5.36	<.0001		

- ✓ 유의하지 않은 변수: B99(금액\_테니스장), B100(금액\_볼링장), B101(금액\_스키장), B103(금액\_당구장)
- ✓ 유의 수준을 GAM에서와 같이 0.05로 설정하면 동일한 결과가 도출됨.

# 8) 'Bcar, 차량' 그룹

Error in smooth.construct.tp.smooth.spec(object, dk\$data, dk\$knots):

A term has fewer unique covariate combinations than specified maximum degrees of freedom.

>> 0이 더 많은 변수?를 직접 찾아봐야 할 듯.

Parameter Estimates								
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > [t]			
Intercept	1	21 00827	12434	168.95	<.0001			
B118	1	4.11499	0.55071	7.47	<.0001			
B119	1	2.54903	0.12615	20.21	<.0001			
B133	1	52.62284	169.82224	0.31	0.7567			
B135	1	29.31563	1.27866	22.93	<.0001			
B157	1	6.04774	0.19172	31.55	<.0001			
B158	1	2.29070	0.22012	10.41	<.0001			
B159	1	3.05506	0.10272	29.74	<.0001			
B165	1	2.27425	0.51637	4.40	<.0001			
B166	1	3.34747	0.65455	5.11	<.0001			

<sup>✓</sup> 유의하지 않은 변수: B133(금액\_견인서비스)

#### 9) 'Bdoc, 의료계' 그룹

```
Family: gaussian
Link function: identity
Formula:
B167 \sim s(B139) + s(B140) + s(B141) + s(B142) + s(B143) + s(B144) +
    s(B145) + s(B146) + s(B147) + s(B148) + s(B149)
Parametric coefficients:
            Estimate Std. Error t value Pr(>|t|)
                                        <2e-16 ***
           2218141
                          9994
                                  221.9
(Intercept)
signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Approximate significance of smooth terms:
              edf Ref.df
                                 F p-value
s(B139) 7.6339685
                       9
                            62.141
                                   < 2e-16 ***
s(B140) 7.7297234
                       9
                          284.807
                                   < 2e-16 ***
s(B141) 7.0574414
                       9
                           37.703 < 2e-16 ***
                           14.901 < 2e-16 ***
s(B142) 6.7733334
                      9
s(B143) 0.2549185
                      9
                            0.038 0.246502
                      9
s(B144) 0.0000067
                            0.000 0.512720
                            6.893 < 2e-16 ***
                      9
s(B145) 1.2211822
                            27.753 < 2e-16 ***
                      9
s(B146) 6.0382273
                            1.121 0.000868 ***
s(B147) 0.9094565
                      9
s(B148) 8.9894872
                      9 2848.756 < 2e-16 ***
s(B149) 8.9673575
                      9 19145.528 < 2e-16 ***
signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
R-sq.(adj) = 0.328
                    Deviance explained = 32.9%
GCV = 4.7274e+13 Scale est. = 4.7268e+13 n = 473228
```

✓ 유의하지 않은 변수: B143(금액\_응급실운영병원), B144(금액\_보건소)

Parameter Estimates							
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > [t]		
Intercept	1	1869960	10827	172.71	<.0001		
B139	1	1.26707	0.05406	23,44	<.0001		
B140	1	1.94229	0.04190	46,35	<.0001		
B141	1	1.34406	0.07518	17.88	<.0001		
B142	1	2,27958	0.22138	10.30	<.0001		
B143	1	1.58448	1.16238	1.36	0.1728		
B144	1	21.01704	26.13092	0.80	0.4212		
B145	1	1.36954	0.17318	7.91	<.0001		
B146	1	1.50049	0.19451	7.71	<.0001		
B147	1	1.23673	0.40558	3.05	0.0023		
B148	1	4.71841	0.03009	156,82	<.0001		
B149	1	1.92492	0.00479	402.25	<.0001		

✓ 유의하지 않은 변수: B143(금액\_응급실운영병원), B144(금액\_보건소), B147(금액\_산후조리원)