

# CREDIT EDA CASE STUDY

By Jainarayan Prajapat

Correlation for target 0 (Defaulter)

SK\_ID\_CURR 1 0.00114 0.0180 0.0034 0.0048 0.0028 0.0050 0.0150 0.0140 0.0098 0.0038 0.0028 0.0130 0.0041 0.0028 0.0028 0.0028 0.0290 0.0110 0.0110 0.0030 0.0028 0.011 0.0029 0.019 0.0166 7e-05 0.0030 0.00180 0.0148 5e-05 0.0140 0.0120 0.0088 0.007 0.0034 0.0041 0.0110 0.0021 0.0027 0.0018 0.0150 0.00810 0.02 0.001 0.0009 0.0011 0.0026 0.0020 0.0140 0.0055 0.0017 0.0110 0.00028 0.0025 0.0021 0.0019 0.0030 0.000810 0.041

CNT\_CHILDREN -0.0011 1 0.013 0.0021 0.021 -0.0019 0.026 0.03 0.24 0.18 -0.028 0.001 0.24 0.056 0.0009 0.003 0.023 0.88 0.085 0.025 -0.0073 0.013 0.0082 0.015 0.02 0.071 0.07 -0.018 0.04 0.016 0.0012 0.015 -0.00180 0.0099 0.0018 0.057 0.0037 0.017 0.16 -0.0015 0.052 -0.002 0.00280 0.053 0.00290 0.0039 0.0055 0.0036 0.01 0.010077 0.004 0.00088 0.00990 0.0290 0.0018 0.00114 0.01 0.008 0.0049 0.035

AMT\_INCOME\_TOTAL -0.018 0.013 1 0.16 0.19 0.16 0.075 0.027 0.064 0.028 0.00850 0.0033 0.064 -0.017 0.00788 0.003 0.038 0.016 0.085 0.005 0.0092 0.036 0.031 0.062 0.058 0.0036 0.0064 0.0083 0.061 0.031 0.021 0.011 0.0073 0.0022 0.0031 0.00240 0.0024 0.0050 0.014 0.0035 0.0039 0.027 0.0079 0.016

AMT\_CREDIT -0.00304 0.0021 0.16 1 0.77 0.99 0.1 -0.055 0.067 0.0096 0.0066 0.0014 0.066 -0.021 0.024 0.026 0.017 0.063 0.1 0.11 0.053 0.024 0.052 0.053 0.027 -0.019 8e-05 0.013 0.007 0.0009 -0.021 0.00094 0.023 0.074 0.0089 0.096 0.00063 0.012 0.047 0.004 0.083 0.023 0.0031 0.029 0.0039 0.052 0.049 0.032 0.062 0.012 0.034 0.021 0.031 0.016 0.0024 0.005 0.0016 0.056 0.02 -0.037

AMT\_ANNUITY -0.00043 0.0021 0.19 0.77 1 0.77 0.12 0.0094 0.1 0.039 0.011 0.00015 0.1 -0.025 0.022 0.011 0.072 0.076 0.13 0.14 0.052 0.041 0.079 0.075 -0.0062 0.0089 0.01 0.13 0.027 0.011 0.022 0.011 0.024 0.046 0.0034 0.1 0.011 0.0016 0.007 0.074 0.0023 0.13 0.034 0.00340 0.0370 0.0085 0.025 0.037 0.016 0.0072 0.0032 0.00970 0.0046 0.012 0.018 0.0039 0.0023 0.013 0.037 0.011 0.0083

AMT\_GOODS\_PRICE -0.00026 0.019 0.16 0.99 0.77 1 0.1 0.054 0.065 0.012 -0.0093 0.014 0.063 0.00779 0.021 0.042 0.017 0.061 0.1 0.062 0.026 0.053 0.023 0.00201 0.024 0.074 0.011 0.075 0.0011 0.006 0.045 0.0077 0.0081 0.024 0.004 0.052 0.049 0.033 0.058 0.012 0.033 0.02 0.032 0.014 0.017 0.0054 0.0019 0.057 0.021 0.002 0.039

REGION\_POPULATION\_RELATIVE 0.00085 0.026 0.075 0.1 0.12 0.1 1 -0.03 0.004 0.054 0.004 0.0013 0.004 -0.016 0.012 0.091 0.04 -0.024 0.53 0.53 0.17 0.0021 0.057 0.081 0.05 -0.044 0.015 0.12 -0.0045 0.012 0.0058 0.011 0.002 0.044 0.03 0.085 0.081 0.004 0.044 0.0034 0.0024 0.089 0.038 0.002 0.025 -0.0004 0.031 0.032 0.0094 0.0063 0.0074 0.013 0.00244 5e-05 0.0034 0.002 0.0012 0.0023 0.0072 -0.0018 5e-05

DAYS\_BIRTH -0.0015 0.23 0.027 0.055 0.0094 0.054 -0.03 1 -0.62 0.33 0.27 0.013 0.62 0.17 0.015 0.042 0.088 0.28 0.0094 0.0001 0.091 0.065 0.096 0.07 0.18 0.24 0.16 0.092 0.18 0.00730 0.0040 0.069 0.019 0.083 0.002 0.11 0.0028 0.017 0.41 0.0015 0.11 0.018 0.00170 0.045 0.00024 0.026 0.031 0.032 0.004 0.0079 0.044 0.0036 0.009 0.027 0.0036 0.001 0.004 0.0036 0.016 0.073

DAYS\_EMPLOYED -0.0014 0.24 0.064 0.067 0.1 -0.065 0.004 0.62 1 -0.21 0.27 0.0008 -1 0.23 0.013 0.015 -0.062 0.23 0.033 0.035 0.091 0.036 0.11 0.096 0.091 0.25 0.22 0.021 0.1 0.0058 0.017 0.0059 0.014 0.023 0.0031 0.25 0.0044 0.02 0.6 0.0022 0.12 0.0240 0.00440 0.029 -0.012 0.026 0.023 0.014 0.043 0.0072 0.04 0.01 0.01 0.0084 0.0040 0.00310 0.0025 0.032 0.013 0.045

DAYS\_REGISTRATION -0.00097 0.18 0.028 0.0096 0.039 0.012 0.054 0.03 0.21 0.1 0.1 -0.0001 0.21 0.058 0.0038 0.075 0.034 0.17 0.06 0.011 0.028 0.037 0.028 0.064 0.1 0.073 0.06 0.096 0.0091 0.0034 0.0091 0.0045 0.057 0.0045 0.04 -0.0042 0.012 0.14 0.0014 0.057 0.00990 0.0029 0.015 0.0017 0.015 0.012 0.0082 0.026 0.0021 0.017 0.0048 0.007 0.0039 0.0027 0.00054 0.011 0.011 0.0013 0.023

DAYS\_ID\_PUBLISH -0.0038 0.028 0.0085 0.0066 0.011 -0.0093 0.004 0.27 -0.27 0.1 0.1 -0.0023 0.27 0.046 0.0008 0.038 0.028 0.021 0.00510 0.0077 0.032 0.035 0.048 0.034 0.076 0.099 0.061 0.051 0.11 0.0037 0.0027 0.013 0.00027 0.013 0.00043 0.089 0.0035 0.005 0.00050 0.0021 0.18 3.4e-05 0.024 0.015 0.012 0.023 0.0022 0.003 0.00870 0.00160 0.0028 0.0048 0.014 0.0009 7e-05 0.017 0.0018 0.003 0.0067 0.019 0.017 0.048

FLAG\_MOBIL -0.0028 0.001 0.00030 0.0140 0.00150 0.014 0.0013 0.00310 0.00030 0.001 0.002 1 0.00085 0.009 7.8e-05 0.0110 0.00440 0.00030 0.00018 0.0018 0.0055 0.0022 0.0042 0.0037 0.0055 0.00099 0.008 0.00490 0.002 0.0110 0.00050 0.011 0.00050 0.004 2e-05 0.0028 1e-05 0.00022 0.0055 2e-05 0.00630 0.0018 6e-004 0.00114 6e-004 0.00119 8e-05 6 0.00182 9e-05 0.02 4.4e-01 5e-05 3e-08 0.0018 0.00130 0.0022 0.00048 0.00056 0.008

FLAG\_EMP\_PHONE -0.0013 0.24 0.064 0.066 0.1 0.063 0.004 0.62 1 0.21 0.27 0.0008 1 0.23 0.013 0.016 0.063 0.23 0.033 0.035 0.091 0.011 0.096 0.092 0.26 0.22 0.019 0.1 -0.0058 0.017 0.0059 0.014 0.021 0.003 0.25 0.0047 0.01 0.6 0.0016 0.12 0.024 0.0064 0.029 0.0012 0.026 0.024 0.014 0.043 0.0071 0.041 0.01 0.01 0.0086 0.0044 0.00030 0.0025 0.032 0.014 0.045

FLAG\_WORK\_PHONE -0.0004 0.056 0.017 0.021 0.0250 0.0079 0.016 0.17 0.23 0.058 0.046 0.0009 0.23 1 0.022 0.29 0.012 0.067 0.073 0.013 0.037 0.064 0.068 0.042 0.046 0.12 0.11 0.019 0.057 0.01 0.0075 0.012 0.007 0.042 0.002 0.06 0.0045 0.037 0.14 0.0019 0.021 0.0083 0.0027 0.12 0.0013 0.0018 0.00270 0.0077 0.0057 0.0013 0.032 0.012 0.0018 0.015 0.0053 0.0044 0.00470 0.0029 0.022 0.071

FLAG\_CNT\_MOBILE -0.00280 0.0070 0.083 0.024 0.022 0.021 0.012 0.015 0.013 0.0038 0.00087 8e-05 0.013 0.022 1 0.0063 0.0050 0.0022 0.013 0.014 0.0016 0.001 0.01130 0.00290 0.00088 0.003 0.0037 0.0035 0.011 0.0033 0.0049 0.0033 0.0053 0.029 0.00028 0.0062 0.00390 0.0054 0.01 0.0048 0.022 0.0082 0.00210 0.00270 0.00011 0.065 0.073 0.014 0.031 0.013 0.043 0.00510 0.0097 0.016 0.0047 0.0026 0.00870 0.0048 0.0057 0.024

FLAG\_PHONE -0.0028 0.03 0.00016 0.026 0.011 0.042 0.091 0.042 0.015 0.075 0.038 0.0011 0.016 0.29 0.0063 1 0.015 0.015 0.084 0.079 0.059 0.0021 0.0043 0.0056 0.048 0.046 0.042 0.0010069 0.03 0.029 0.03 0.028 0.067 0.0020 0.008 0.005 0.0098 0.013 0.0048 0.013 0.0046 0.0032 0.0016 0.007 0.01 0.008 0.01 0.0044 0.0041 0.00970 0.00069 2e-05 0.00240 0.00230 0.013 0.032 0.0064 0.051

FLAG\_EMAIL -0.00028 0.023 0.0083 0.017 0.017 0.017 0.017 0.04 0.088 0.062 0.034 0.028 0.00044 0.063 0.012 0.0054 0.015 1 0.018 0.052 0.051 0.024 0.019 0.031 0.027 0.014 0.042 0.0024 0.004 0.0024 0.0034 0.0024 0.0024 0.019 0.0027 0.012 0.0054 0.0075 0.0043 0.0017 0.03 0.0095 0.018 0.00370 0.00630 0.0040 0.0015 0.0033 0.013 0.014 0.00814 0.00250 0.0180 0.00650 0.035 0.0039 0.021 0.025 0.014 0.051

CNT\_FAM\_MEMBERS -0.0027 0.88 0.016 0.063 0.076 0.061 0.024 0.28 0.23 0.17 0.021 0.0003 0.23 0.067 0.00022 0.015 0.018 1 0.03 0.031 0.012 0.017 0.0031 0.012 0.012 0.071 0.07 0.018 0.027 0.025 0.0025 0.025 0.0046 0.027 0.00056 0.066 0.0031 0.015 0.16 0.0023 0.057 0.0061 0.03 0.0070 0.00970 0.0053 0.01 0.0037 0.00970 0.00076 0.015 0.00220 0.00190 0.0058 0.00150 0.0044 0.00780 0.0040 0.0067 0.021

REGION\_RATING\_CLIENT -0.0011 0.025 0.085 0.1 0.13 0.1 0.53 0.0094 0.033 0.08 0.00510 0.0019 0.033 0.0073 0.013 0.084 0.052 0.035 1 0.95 0.29 0.044 0.14 0.15 0.036 0.0084 0.019 0.29 0.012 0.035 0.016 0.035 0.018 0.026 0.0013 0.063 0.007 0.002 0.021 0.0013 0.0030 0.0049 0.01 0.00026 0.032 0.038 0.0030 0.0540 0.044 0.013 0.0012 0.0022 0.00190 0.059 0.002 0.0018 0.064 0.055 0.011

REGION\_RATING\_CLIENT\_W\_CITY -0.0011 0.025 0.092 0.11 0.14 0.11 0.53 0.0081 0.035 0.074 0.00770 0.0011 0.035 0.013 0.014 0.079 0.051 0.031 0.95 1 0.95 0.29 0.044 0.13 0.14 0.036 0.008 0.028 0.29 0.011 0.031 0.014 0.03 0.017 0.026 0.004 0.0067 0.0056 0.016 0.02 0.001 0.088 0.039 0.017 0.013 0.0016 0.033 0.038 0.00930 0.0540 0.042 0.014 0.0015 0.0026 0.0015 0.0059 0.0014 0.062 0.005 0.011

HOURL\_APPR\_PROCESS\_START 0.000350 0.073 0.036 0.051 0.052 0.062 0.17 0.091 0.091 0.01 0.032 0.00052 0.091 0.037 0.0016 0.059 0.037 0.29 0.26 0.1 0.055 0.075 0.061 0.017 0.022 0.016 0.16 0.037 0.009 0.0059 0.009 0.015 0.002 0.014 0.0006 0.026 0.07 0.0021 0.003 0.016 0.026 0.014 0.035 0.024 0.022 0.0095 0.019 0.0052 0.022 0.0025 0.0033 0.004 0.014 0.0025 0.04 0.037 0.0015 0.025

REG\_REGION\_NOT\_LIVE\_REGION -0.0028 0.013 0.031 0.024 0.041 0.026 0.0021 0.065 0.036 0.028 0.035 0.00022 0.037 0.064 0.001 0.0021 0.019 0.017 0.044 0.041 0.055 1 0.45 0.088 0.34 0.1 0.036 0.016 0.042 0.022 0.007 0.038 0.009 0.001 0.034 0.0011 0.005 0.024 0.0021 0.024 0.017 0.001 0.001 0.00320 0.0034 0.0021 0.002 0.006 0.005 0.0045 0.0083 0.00190 0.028 0.005 0.0023 0.0168 1e-05 0.0150 0.0037 0.018

REG\_REGION\_NOT\_WORK\_REGION -0.0011 0.0082 0.062 0.052 0.079 0.053 0.057 0.096 0.11 0.037 0.048 0.00402 0.11 0.068 0.0013 0.0043 0.031 0.0031 0.14 0.13 0.075 0.45 1 0.86 0.15 0.24 0.2 0.03 0.042 0.029 0.017 0.029 0.017 0.036 0.00077 0.021 0.0021 0.016 0.067 0.0021 0.06 0.02 0.002 0.059 0.0059 0.012 0.013 0.0026 0.0009 0.0017 0.0074 0.001 0.0013 0.001 0.002 0.00190 0.015 0.0062 0.0062 0.022

LIVE\_REGION\_NOT\_WORK\_REGION -0.0029 0.015 0.058 0.053 0.075 0.053 0.081 0.07 0.096 0.028 0.034 0.00037 0.096 0.042 0.0029 0.0056 0.027 0.012 0.15 0.14 0.061 0.088 0.86 1 0.021 0.19 0.04 0.03 0.025 0.023 0.017 0.023 0.017 0.021 0.0012 0.01 0.0019 0.013 0.059 0.0007 0.06 0.015 0.00998 0.00740 0.0053 0.016 0.014 0.037 0.0043 0.0013 0.0043 0.00310 0.00250 0.002 0.0011 0.00114 0.0018 0.007 0.006 0.017

REG\_CITY\_NOT\_LIVE\_CITY -0.0019 0.02 0.0036 0.012 0.0062 0.027 0.05 0.18 0.019 0.091 0.064 0.076 0.00053 0.092 0.046 0.00880 0.048 0.012 0.036 0.004 0.017 0.34 0.15 0.021 1 0.44 0.028 0.043 0.067 0.012 0.0072 0.013 0.0076 0.054 0.00103 0.00316 1e-05 0.00310 0.004 0.005 0.0014 0.018 0.0053 0.037 0.055 0.00740 0.00260 0.0042 0.0025 0.013 0.01 0.001 0.00510 0.012 0.00260 0.0030 0.00274 0.0032 0.013 0.00280 0.0095

REG\_CITY\_NOT\_WORK\_CITY -0.0016 0.071 0.0064 0.019 0.00089 0.02 0.044 0.24 0.25 0.1 0.099 0.00099 0.26 0.12 0.0033 0.046 0.0042 0.071 0.0084 0.028 0.022 0.14 0.24 0.19 0.44 1 0.83 0.076 0.06 0.0044 0.0062 0.046 0.002 0.047 0.0024 0.056 0.0024 0.012 0.16 0.0013 0.043 0.0014 0.0063 0.034 0.0014 0.00890 0.0056 0.015 0.004 0.0015 0.014 0.0039 0.0007 0.00350 0.00340 0.0025 0.043 0.014 0.0082 0.012

LIVE\_CITY\_NOT\_WORK\_CITY 0.7e-05 0.007 0.0083 1e-05 0.01 -0.0013 0.015 0.16 0.22 0.073 0.001 0.0084 0.022 0.011 0.0037 0.024 0.0041 0.077 0.019 0.028 0.016 0.0098 0.2 0.24 0.028 0.83 1 0.059 0.039 0.001 0.004 0.00033 0.0021 0.017 0.054 0.0023 0.014 0.13 0.0015 0.043 0.0049 0.013 0.0027 0.012 0.012 0.00950 0.00490 0.00029 0.0031 0.0012 0.0063 0.002 0.0019 0.0044 0.0013 0.0022 0.004 0.0064 0.0081 0.01

EXT\_SOURCE\_2 -0.0023 0.018 0.061 0.13 0.13 0.14 0.02 -0.092 0.021 0.06 0.0510 0.0049 0.019 -0.019 0.0033 0.061 0.024 0.018 0.077 0.029 0.026 0.16 0.016 0.03 0.003 0.043 0.0076 0.059 1 0.094 0.02 0.031 0.019 0.032 0.009 0.031 0.003 0.0043 0.00053 0.051 0.017 0.021 0.043 0.0032 0.024 0.021 0.0084 0.013 0.0026 0.0018 0.0032 0.0006 0.0072 0.0026 0.016 0.0041 0.052 0.0026 0.012

EXT\_SOURCE\_3 0.00018 0.04 0.031 0.037 0.027 0.04 0.0045 0.18 0.1 0.096 0.11 0.0002 0.1 0.057 0.011 0.0069 0.048 0.027 0.012 0.011 0.037 0.042 0.042 0.025 0.067 0.069 0.039 0.094 1 0.0012 0.033 0.0015 0.031 0.064 0.00073 0.028 0.0029 0.0049 0.067 0.00054 0.015 0.00510 0.0041 0.0078 0.0110 0.00024 0.0017 0.00049 0.0016 0.00093 0.015 0.0025 0.014 0.011 0.0024 0.0078 0.023 0.014 0.023 0.075

OBJ\_30\_CNT\_SOCIAL\_CIRCLE -0.0014 0.016 0.013 0.0009 0.011 0.010 0.0079 0.01 0.00073 0.0058 0.0091 0.013 0.0011 0.0058 0.011 0.0033 0.033 0.0029 0.025 0.016 0.009 0.021 0.029 0.023 0.012 0.01 0.00440 0.0031 0.02 0.021 0.1 0.33 1 0.25 0.015 0.0012 0.029 0.0014 0.01 0.0038 0.0018 0.023 0.0077 0.014 0.0038 0.0044 0.0028 0.0036 0.0090 0.0046 0.0014 0.00350 0.0098 0.0047 0.00078 0.00066 0.002 0.00085 0.0026 0.0052 0.032

DEF\_30\_CNT\_SOCIAL\_CIRCLE 8.5e-05 0.012 0.013 0.021 0.022 0.0025 0.0014 0.012 0.0034 0.00270 0.0058 0.017 0.0075 0.0049 0.029 0.0033 0.035 0.016 0.014 0.0059 0.0079 0.017 0.017 0.00720 0.0026 0.004 0.031 0.033 0.33 1 0.33 0.86 0.010 0.0024 0.029 0.0016 0.01 0.0038 0.0018 0.023 0.0077 0.014 0.0038 0.0044 0.0028 0.0036 0.0090 0.0046 0.0014 0.00350 0.0098 0.0047 0.00078 0.00066 0.002 0.00085 0.0026 0.0052 0.032

OBJ\_60\_CNT\_SOCIAL\_CIRCLE -0.0014 0.015 0.013 0.00094 0.011 0.010 0.0081 0.01 0.0069 0.0059 0.0091 0.013 0.0014 0.0059 0.012 0.0033 0.033 0.0026 0.025 0.035 0.01 0.009 0.021 0.029 0.023 0.013 0.0040 0.0017 0.019 0.0015 1 0.33 1 0.26 0.016 0.001 0.029 0.0015 0.01 0.0039 0.0018 0.023 0.0078 0.015 0.0038 0.0043 0.0029 0.0036 0.0090 0.0044 0.0013 0.0034 0.001 0.00040 0.0066 0.0059 0.002 0.00960 0.0027 0.005 0.032

DEF\_60\_CNT\_SOCIAL\_CIRCLE -0.0012 0.0018 0.013 0.023 0.024 0.002 0.0019 0.014 0.0045 0.0043 0.0005 0.014 0.007 0.0053 0.028 0.0021 0.0046 0.016 0.017 0.0089 0.047 0.012 0.017 0.0076 0.002 0.0033 0.032 0.031 0.25 0.86 0.26 1 0.0018 0.0024 0.013 0.0025 0.0048 0.0065

Points to be concluded from the graph presented before.

- ▶ Credit amount is inversely proportional to the date of birth, which means Credit amount is higher for low age and vice-versa.
- ▶ Credit amount is proportional to goods price ,means Credit amount is higher for goods price .
- ▶ less children client have in densely populated area.
- ▶ Credit amount is higher to densely populated area.
- ▶ The income is also higher in densely populated area.

Correlation for target 1( Repayer )



SK_ID_CURR	1	-0.00114	0.00180	0.00334	0.00048	0.00276	0.00050	0.01500	0.00140	0.00098	0.00380	0.02870	0.00130	0.00430	0.00280	0.00280	0.00280	0.02940	0.01110	0.00130	0.00030	0.00280	0.01100	0.00290	0.00190	0.00166	7e-05	0.00230	0.00180	0.01485	-0.050	0.01400	0.00120	0.00080	0.007	-0.00340	0.00410	0.00110	0.00210	0.00270	0.00018	0.00150	0.000810	-0.002	-0.010	0.00090	0.00110	0.00260	0.00072	0.00140	0.00050	0.00010	0.00170	0.00110	0.000280	0.00250	0.00210	0.00090	0.00030	0.000810	0.0041	
CNT_CHILDREN	<0.001	1	0.013	0.0021	0.0021	0.0019	0.0026	0.33	-0.24	0.18	-0.028	0.001	0.24	0.056	-0.00070	-0.03	0.023	0.88	0.025	0.025	-0.00730	-0.013	0.0082	0.015	0.02	0.071	0.07	-0.018	-0.04	-0.016	-0.0012	0.015	0.0184	0.0059	0.0018	0.057	-0.0037	-0.017	-0.16	-0.0015	0.052	-0.002	-0.00280	0.0050	0.000290	0.0039	-0.0055	0.0036	0.011	0.00077	0.004	0.00080	0.00090	0.00230	0.00010	0.000110	0.0011	-0.008	-0.0049	-0.0035		
AMT_INCOME_TOTAL	<0.0018	0.013	1	0.16	0.19	0.16	0.075	0.027	-0.064	0.028	0.00850	0.00033	0.064	-0.017	-0.00830	0.0016	0.038	0.016	-0.085	-0.092	0.036	0.031	0.062	0.058	0.030	0.064	0.0083	0.061	-0.031	-0.013	-0.013	-0.019	-0.010	-0.0170	0.00530	0.012	-0.046	0.0038	0.078	0.018	0.00290	0.00230	0.0025	0.023	0.021	0.011	0.00730	0.0022	0.0031	0.00240	0.00024	0.0050	0.0014	0.0035	0.0039	0.027	0.0079	0.016				
AMT_CREDIT	<0.00340	0.021	0.16	1	0.77	0.99	0.1	-0.055	-0.067	0.0096	-0.00660	0.014	0.066	-0.021	0.024	0.026	0.017	0.063	-0.1	0.013	0.053	0.024	0.052	0.005	-0.027	-0.019	8.1e-05	0.013	0.007	0.00090	-0.0210	0.00094	-0.023	0.0074	0.0089	0.096	0.00663	-0.012	-0.047	-0.004	0.003	0.082	0.003	0.0031	0.029	0.0039	0.052	0.049	0.032	0.062	-0.012	0.034	0.021	0.031	-0.016	-0.0024	0.005	0.0016	0.056	0.02	-0.037	
AMT_ANNUITY	>0.00043	0.021	0.19	0.77	1	0.77	0.12	0.0094	-0.1	0.039	0.011	0.00015	0.1	-0.025	0.022	0.011	0.072	0.076	-0.13	-0.14	0.052	0.041	0.079	0.075	-0.060	0.0089	0.01	0.13	0.027	-0.011	-0.022	0.011	-0.024	0.064	0.0034	0.01	0.0011	-0.0067	0.074	0.0023	0.013	0.034	-0.00340	0.00730	0.00085	0.025	0.037	0.016	0.0072	0.0032	-0.00970	0.0046	0.012	-0.018	0.00390	0.0023	0.013	0.037	0.011	-0.0083		
AMT_GOODS_PRICE	<0.00260	0.019	0.16	0.99	0.77	1	0.1	-0.054	0.065	0.012	-0.00930	0.014	0.063	0.00079	0.021	0.042	0.017	0.061	-0.1	-0.11	0.062	0.026	0.053	0.079	-0.02	-0.00313	0.14	0.004	0.00079	-0.002	0.00081	-0.024	-0.004	0.0034	0.001	0.075	0.0011	-0.006	-0.050	0.00072	0.081	0.024	-0.0021	0.035	0.0041	0.052	0.049	0.033	0.058	-0.012	0.033	0.02	0.032	-0.014	-0.0170	0.0054	0.0019	0.057	0.021	-0.0093		
REGION_POPULATION_RELATIVE	>0.00085	0.026	0.075	0.1	0.12	0.1	1	-0.03	-0.004	-0.054	-0.004	0.0013	0.004	-0.016	-0.012	0.091	0.04	-0.024	0.53	-0.53	0.17	0.0021	0.057	0.081	-0.05	-0.044	-0.015	0.2	-0.0045	-0.012	0.0058	0.011	0.002	-0.044	-0.03	-0.085	0.0081	0.016	0.000730	0.0024	0.089	0.038	0.002	0.025	-0.0004	0.031	0.032	0.0094	0.0063	0.0074	0.013	0.00244	5e-050	0.0034	-0.002	0.0012	0.0023	0.072	-0.00198	5e-05		
DAYS_BIRTH	<-0.0015	0.33	0.027	-0.055	0.0094	-0.054	-0.03	1	-0.62	0.33	0.27	-0.013	0.62	-0.17	-0.015	-0.042	0.088	0.28	0.0094	-0.0081	0.091	0.065	0.096	0.07	0.18	0.24	0.16	-0.092	-0.18	0.00730	0.00140	0.0069	0.019	0.083	-0.0012	0.11	-0.0028	0.017	-0.41	0.0015	0.11	0.018	-0.00170	0.045	0.00024	0.026	0.031	0.013	0.024	0.0079	0.044	0.0036	0.009	0.027	0.0036	0.001	-0.004	-0.0036	-0.016	-0.073		
DAYS_EMPLOYED	<-0.0014	-0.24	-0.064	-0.067	-0.1	-0.065	-0.004	0.62	1	-0.21	-0.27	0.00082	-0.1	-0.23	0.013	0.015	-0.062	-0.23	0.003	0.035	-0.091	-0.036	-0.11	-0.096	-0.091	-0.25	-0.022	-0.021	0.1	0.0058	0.017	0.0059	0.014	0.014	-0.062	0.003	-0.25	0.00044	-0.02	0.6	-0.0022	-0.12	-0.024	0.00444	0.029	-0.012	-0.026	-0.023	-0.014	-0.043	-0.072	-0.04	-0.01	-0.01	-0.00840	0.0040	0.00310	0.0025	-0.032	0.013	0.045	
DAYS_REGISTRATION	>0.00097	0.18	0.028	0.0096	0.039	0.012	-0.054	0.33	-0.21	1	0.001	-0.0021	0.28	0.058	-0.0038	-0.075	0.034	0.17	0.08	0.074	-0.011	0.028	0.037	0.028	0.064	0.1	0.073	-0.06	0.096	0.091	0.0034	0.0091	0.045	-0.007	-0.0045	0.034	-0.0045	0.0012	-0.14	0.0014	0.057	0.00990	0.0029	0.015	0.017	0.015	0.012	0.0082	0.026	0.0021	0.017	0.0048	0.007	0.0039	-0.00270	-0.00050	-0.011	-0.011	-0.0013	-0.023		
DAYS_ID_PUBLISH	>0.00380	-0.028	0.0085	-0.0066	0.011	-0.0093	-0.004	0.27	-0.27	0.1	1	0.0023	0.27	0.048	-0.0038	-0.078	0.028	0.021	0.00510	-0.0077	0.032	0.05	0.028	0.034	0.064	0.079	0.099	0.061	-0.051	-0.11	0.0037	0.0027	0.013	0.00543	0.0089	-0.0035	0.05	-0.00020	0.0012	-0.18	3e-050	0.024	0.015	-0.0021	0.023	0.0022	0.003	0.00870	0.00160	0.0028	0.0048	0.014	0.0009	7e-05	0.017	0.0018	0.03	0.0067	-0.019	-0.017	-0.048	
FLAG_MOBIL	<-0.0028	0.001	0.000330	0.0140	0.00150	0.014	0.0013	0.00310	0.000820	0.0011	0.0023	1	0.000830	0.0093	7e-050	0.0110	0.00040	0.00030	0.0018	0.0018	0.0055	0.0022	0.00042	0.003	0.0055	0.00990	0.008	0.00490	0.0002	0.00110	0.000580	0.011	0.00050	0.0041	2e-050	0.0281	6e-050	0.0022	0.000562	5e-050	-0.00610	0.0018	6e-060	0.00114	6e-060	0.00139	8e-050	0.00182	9e-05	-0.02	4e-054	1e-053	3e-050	0.00118	0.00028	0.00048	0.000560	0.0008				
FLAG_EMP_PHONE	<-0.0013	0.24	-0.064	0.066	0.1	0.063	0.004	0.62	1	0.21	0.27	0.00080	1	0.23	0.013	0.016	0.063	0.23	0.033	0.035	0.091	0.037	0.061	0.11	0.096	0.092	0.26	0.22	0.019	-0.011	-0.058	-0.017	0.0059	0.014	-0.021	0.001	0.25	-0.00047	0.002	-0.6	-0.0016	0.12	0.004	0.00446	0.029	0.001	0.026	0.024	0.014	0.043	0.0071	0.041	0.01	0.00086	0.0044	-0.00030	0.0025	0.032	-0.014	-0.045		
FLAG_WORK_PHONE	<-0.00041	0.056	-0.017	0.0021	-0.0250	0.00079	-0.016	0.17	-0.23	0.058	0.046	0.0009	0.23	1	0.022	-0.29	-0.012	0.067	0.073	0.013	0.037	0.064	0.068	0.042	0.046	0.12	0.011	0.019	-0.057	-0.011	0.0075	-0.012	-0.007	-0.042	0.021	0.06	-0.0045	0.037	-0.14	0.0019	0.021	0.0083	0.0027	0.12	-0.013	0.0018	-0.00270	0.0077	0.0057	0.0013	0.032	-0.012	0.00018	0.0015	-0.00530	0.00440	0.00470	-0.0029	-0.022	-0.071		
FLAG_CNT_MOBILE	<-0.00280	0.00790	0.083	0.024	0.022	0.0021	-0.012	0.015	0.013	-0.00380	0.00087	8e-050	0.013	0.022	1	0.00630	-0.00540	0.00022	0.013	0.014	-0.0016	0.001	0.00130	0.00290	0.000880	0.0033	0.0037	-0.035	0.011	0.0033	0.0049	0.0033	0.0053	-0.029	-0.000280	0.00620	0.00390	0.0054	0.01	0.0048	-0.022	-0.00820	0.00210	0.0270	0.0011	-0.065	-0.073	-0.014	-0.031	-0.013	-0.043	-0.00510	0.00097	-0.016	-0.047	-0.00260	0.00870	0.0048	0.0057	0.024		
FLAG_PHONE	<-0.0028	-0.001	0.000330	0.0140	0.00150	0.014	0.0013	0.00310	0.000820	0.0011	0.0023	1	0.000830	0.0093	7e-050	0.0110	0.00040	0.00030	0.0018	0.0018	0.0055	0.0022	0.00042	0.003	0.0055	0.00990	0.008	0.00490	0.0002	0.00110	0.000580	0.011	0.00050	0.0041	2e-050	0.0281	6e-050	0.0022	0.000562	5e-050	-0.00610	0.0018	6e-060	0.00114	6e-060	0.00139	8e-050	0.00182	9e-05	-0.02	4e-054	1e-053	3e-050	0.00118	0.00028	0.00048	0.000560	0.0008				
FLAG_EMAIL	<-0.00028	0.023	0.038	0.017	0.072	0.017	0.012	0.04	0.088	-0.062	0.034	0.028	-0.00044	0.063	-0.012	-0.0054	0.015	1	0.018	-0.052	-0.051	0.029	0.059	0.021	0.043	0.056	-0.048	-0.046	-0.024	0.061	0.00669	-0.033	-0.029	-0.033	-0.028	-0.0670	-0.00730	-0.008	0.004	0.075	0.098	0.013	0.0048	0.013	0.00432	0.0032	-0.0016	0.007	0.01	0.008	0.01	0.0044	0.0041	0.00970	0.0069	2e-05	-0.00240	0.00230	0.013	0.032	-0.0064	-0.025
FLAG_REGISTRATION	<-0.00028	0.023	0.038	0.017	0.072	0.017	0.012	0.04	0.088	-0.062	0.034	0.028	-0.00044	0.063	-0.012	-0.0054	0.015	1	0.018	-0.052	-0.051	0.029	0.059	0.021	0.043	0.056	-0.048	-0.046	-0.024	0.061	0.00669	-0.033	-0.029	-0.033	-0.028	-0.0670	-0.00730	-0.008	0.004	0.075	0.098	0.013	0.0048	0.013	0.00432	0.0032	-0.0016	0.007	0.01	0.008	0.01	0.0044	0.0041	0.00970	0.0069	2e-05	-0.00240	0.00230	0.013	0.032	-0.0064	-0.025
CNT_FAM_MEMBERS	<-0.0029	0.88	-0.016	0.063	-0.016	-0.024	0.28	-0.23	0.17	-0.021	0.0003	0.23	0.067	0.00022	-0.015	0.052	1	0.003	0.031	-0.012	-0.017	0.0031	0.042	0.012	0.012	0.077	-0.018	0.007	-0.018	0.007	-0.025	0.025	-0.025	0.025	-0.0047	0.0030	0.0066	-0.0031	-0.015	-0.16	-0.0023	-0.057	-0.0061	-0.030	-0.00790	0.0070	0.053	-0.01	0.0037	0.00970	0.00760	0.015	0.00220	0.00190	0.0580	0.0150	0.0044	0.00780	0.00420	0.0067	-0.021	
REGION_RATING_CLIENT	<-0.011	0.025	-0.085	-0.1	-0.13	-0.1	-0.53	0.0094	0.003	0.08	-0.00530	0.0019	0.033	0.0073	0.013	-0.084	-0.052	0.03																																												

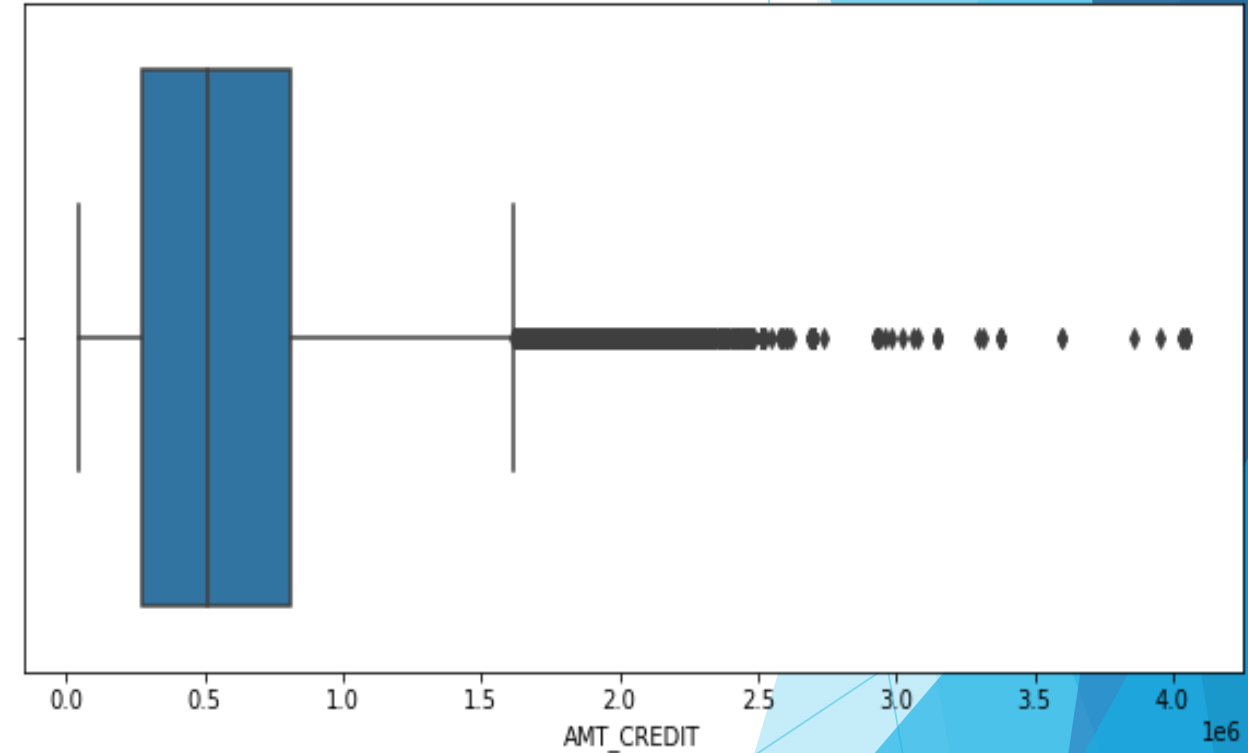
This heat map for Target 1 is also having quite a same observation just like Target 0. But for few points are different. They are listed below.

- ▶ The client's permanent address does not match contact address are having less children and vice-versa
- ▶ The client's permanent address does not match work address are having less children and vice-versa

# Boxplot for Credit Amount

Few points can be concluded from the graph.

- ▶ Some outliers are noticed in **AMT\_CREDIT** .
- ▶ The third quartile is bigger than first quartile for credit amount which means most of the credits of clients are present in the third quartile

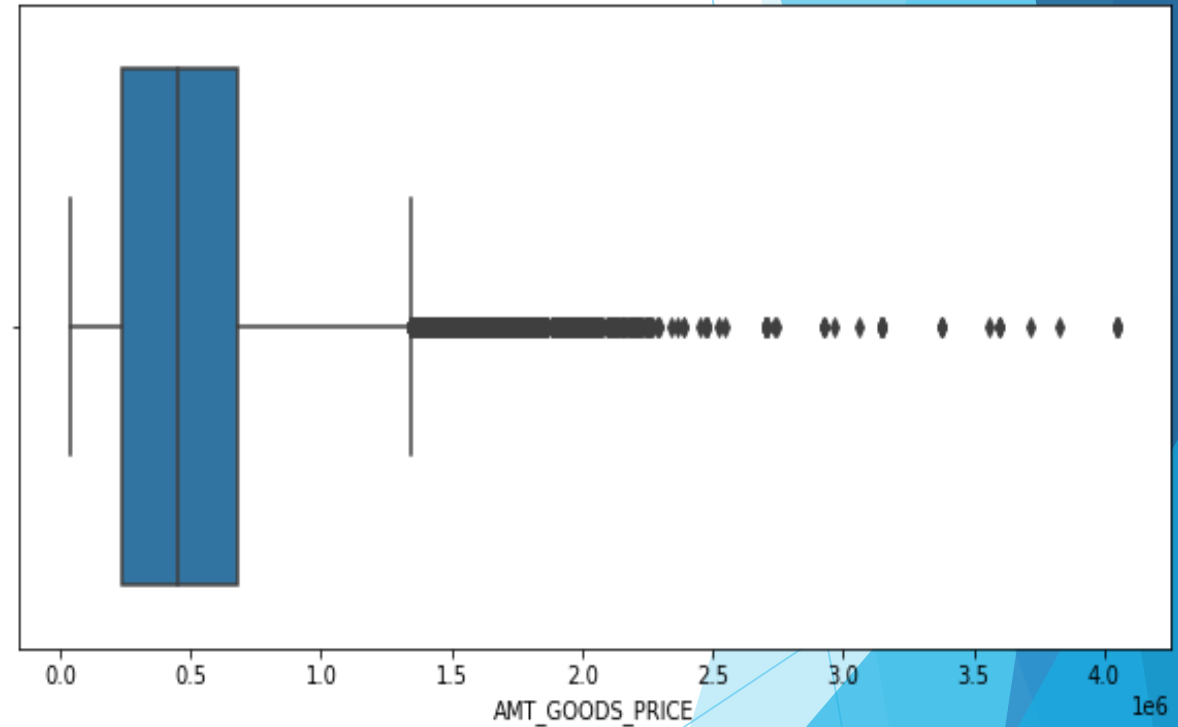




# Boxplot for Goods Price

Few points can be concluded from the graph.

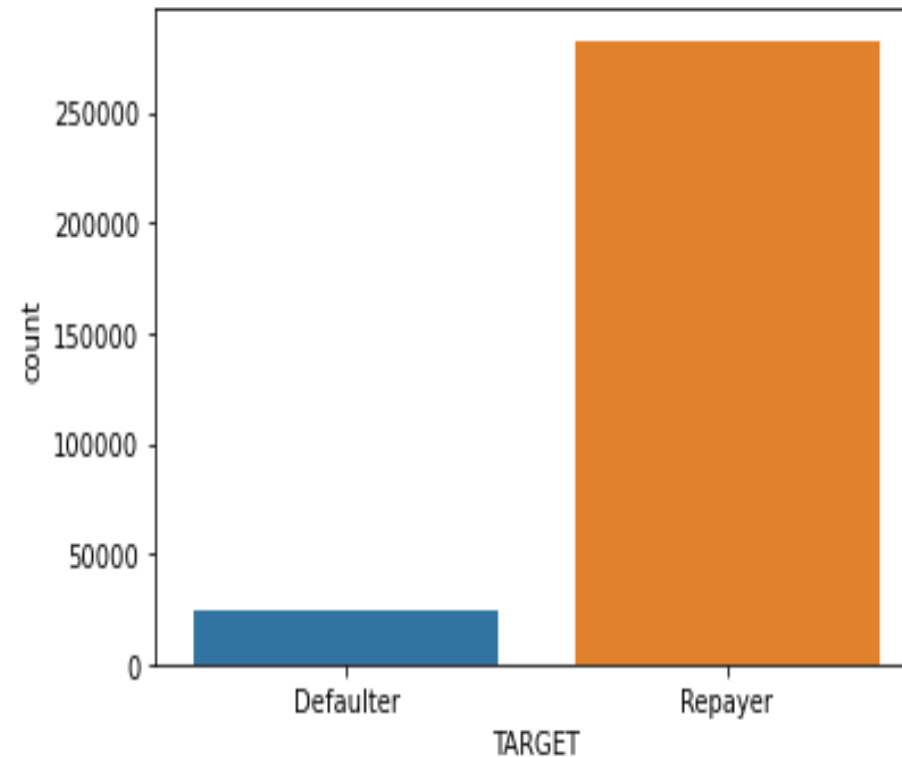
- ▶ Some outliers are noticed in Goods Price.
- ▶ The third quartiles is very slim for income amount.
- ▶ The third quartile is bigger than first quartile for goods price.



# Data Imbalance

Few points can be concluded from the graph.

- ▶ Repayer = 91.92%
- ▶ Defaulter = 8.07%
- ▶ So data is clearly Imbalance

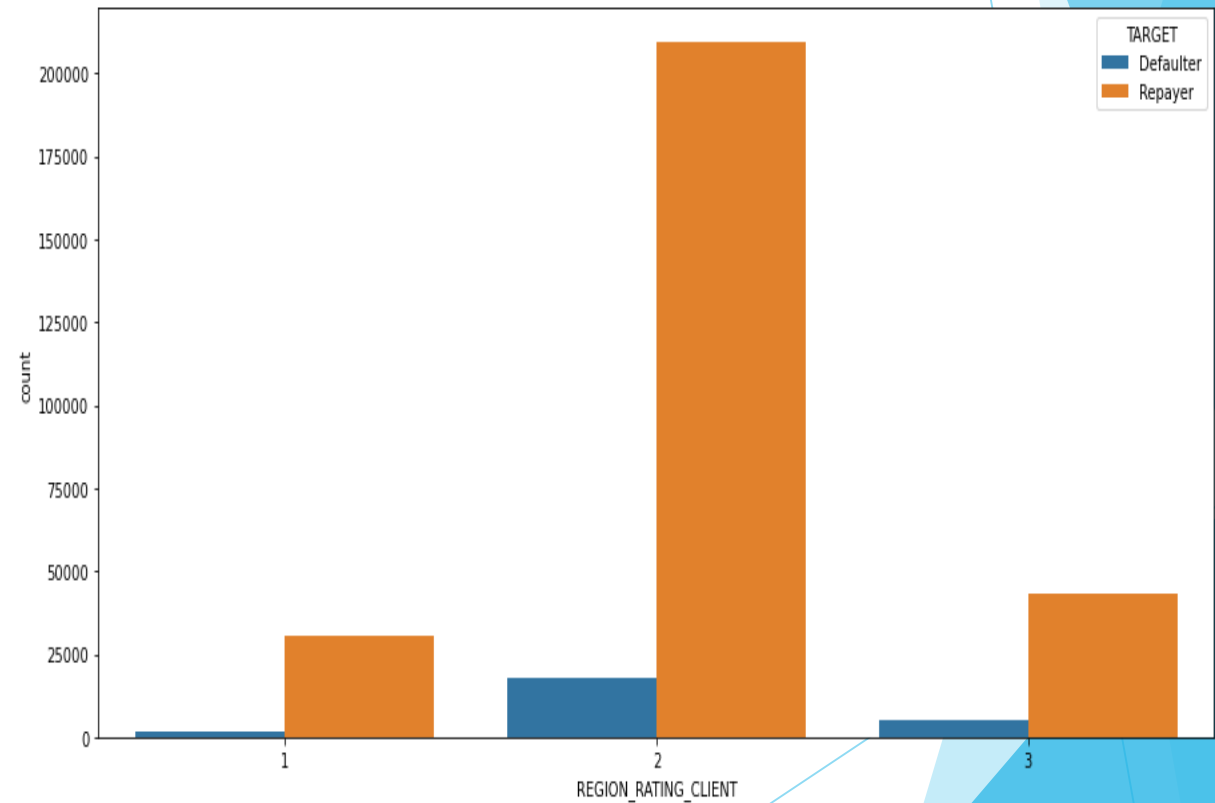


# Univariate and Bivariate Analysis

# REGION\_RATING\_CLIENT

Few points can be concluded from the graph.

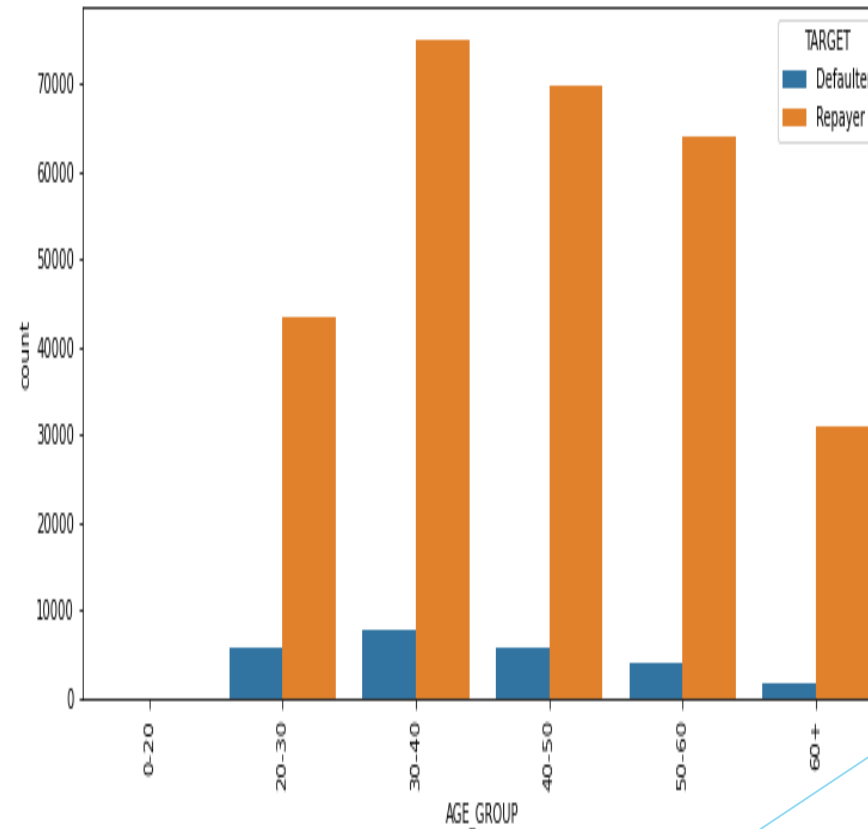
- ▶ As shown in graph Region rating 1 or 2 are safer.
- ▶ Also Region rating 2 apply the most.



# AGE\_GROUP

Few points can be concluded from the graph.

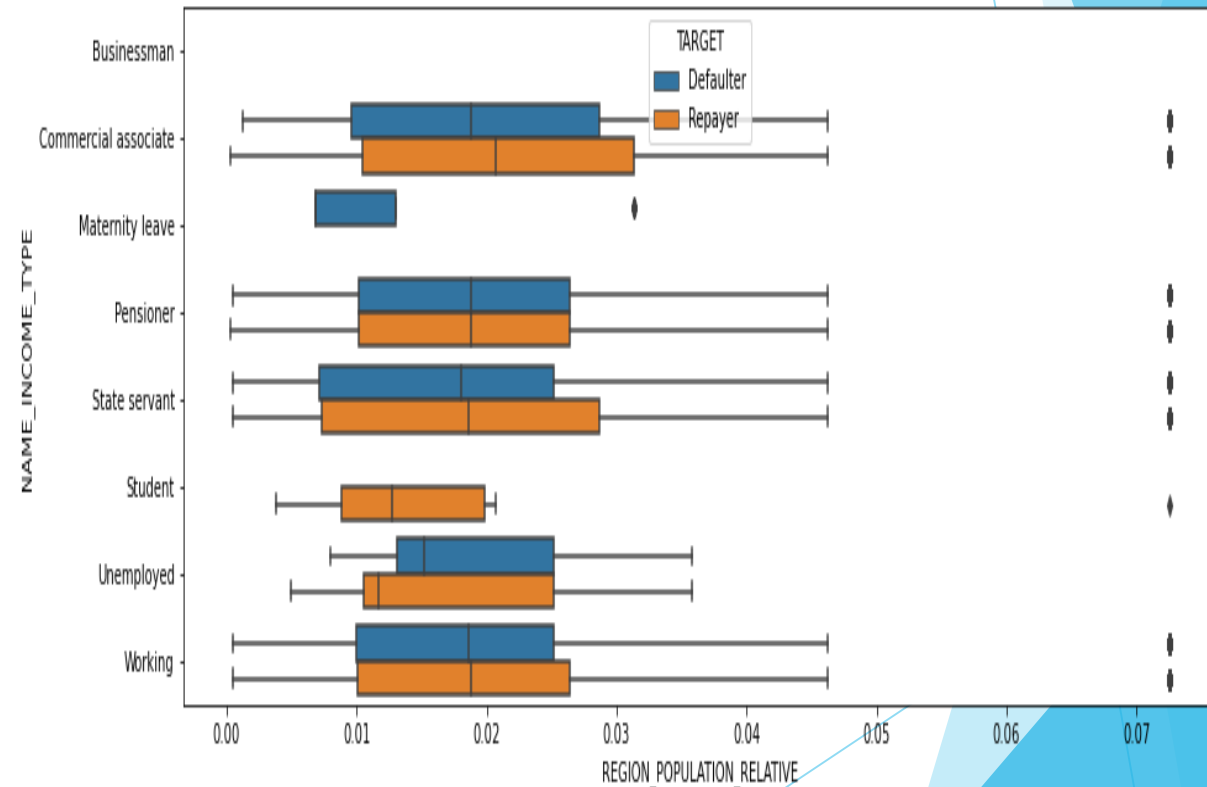
- ▶ Young Clients who are in age of 20-30 have higher chance to become defaulter.
- ▶ Age of 30-60 Clients are more safer.



# Income type v/s Region rating

Few points can be concluded from the graph.

- ▶ Student who live in 0.01-0.02 never become a defaulter.
- ▶ Avoid working Clients who have a low profile job.





Conclusions :

## Decisive Factor whether an applicant will be Defaulter :

- ▶ **CODE\_GENDER:** Men are at relatively higher default
- ▶ **NAME\_FAMILY\_STATUS :** People who have civil marriage or who are single default a lot.
- ▶ **NAME\_EDUCATION\_TYPE:** People with Lower Secondary & Secondary education
- ▶ **AMT\_INCOME\_TOTAL:** Clients who have low income.
- ▶ **REGION\_RATING\_CLIENT:** people who live in Rating 3 has highest defaults.
- ▶ **OCCUPATION\_TYPE:** low profile job people .
- ▶ **ORGANIZATION\_TYPE:** low profile job people.
- ▶ **AGE\_GROUP:** young people who are in age group of 20-30
- ▶ **DAYS\_EMPLOYED:** People who have less than 5 years of employment .
- ▶ **CNT\_CHILDREN & CNT\_FAM\_MEMBERS:** Client who have more than 2 children & have more than 3 family member.
- ▶ **AMT\_GOODS\_PRICE:** When the amount goes beyond 6lakhs or less than 1lakhs.

## Decisive Factor whether an applicant will be Repayer :

- ▶ NAME\_EDUCATION\_TYPE: Academic degree has less defaults.
- ▶ NAME\_INCOME\_TYPE: Student and Businessmen have no defaults.
- ▶ REGION\_RATING\_CLIENT: RATING 1 is safer. and 3 is worst
- ▶ ORGANIZATION\_TYPE: Clients with Trade Type 4 and 5 and Industry type 8 have Defaulter
- ▶ AGE\_GROUP: People have age of 50-60 have low probability of defaulting
- ▶ DAYS\_EMPLOYED: Clients with 30+ year experience have less chance to become defaulter
- ▶ AMT\_INCOME\_TOTAL: Applicant with higher Income are less likely to default
- ▶ CNT\_CHILDREN: People with zero to two children tend to repay the loans.

## Suggestions :

- ▶ Banks should focus more on contract type 'Student' , 'pensioner' and 'Businessman' with housing 'type other than 'Co-op apartment' for successful payments.
- ▶ Banks should focus less on income type 'Working' as they are having most number of unsuccessful payments.
- ▶ Also with loan purpose 'Repair' is having higher number of unsuccessful payments on time.
- ▶ Get as much as clients from housing type as they are having least number of unsuccessful payments.

Thank you