```
In [1]: import pandas as pd
                    import matplotlib.pyplot as plt
                    import seaborn as sns
In [2]: # Load the dataset
                    df_1=pd.read_csv(r"C:\Users\arumu\Downloads\cardio_train.csv")
                    df 1
                                   id; age; gender; height; weight; ap\_hi; ap\_lo; cholesterol; gluc; smoke; alco; active; cardious active; ca
Out[2]:
                                                                                                                               0;18393;2;168;62.0;110;80;1;1;0;0;1;0
                            1
                                                                                                                               1;20228;1;156;85.0;140;90;3;1;0;0;1;1
                                                                                                                               2;18857;1;165;64.0;130;70;3;1;0;0;0;1\\
                            2
                             3
                                                                                                                             3;17623;2;169;82.0;150;100;1;1;0;0;1;1
                                                                                                                               4;17474;1;156;56.0;100;60;1;1;0;0;0;0
                                                                                                                      99993;19240;2;168;76.0;120;80;1;1;1;0;1;0
                    69995
                                                                                                                    99995;22601;1;158;126.0;140;90;2;2;0;0;1;1
                    69996
                    69997
                                                                                                                    99996;19066;2;183;105.0;180;90;3;1;0;1;0;1
                    69998
                                                                                                                      99998;22431;1;163;72.0;135;80;1;2;0;0;0;1
                                                                                                                      99999;20540;1;170;72.0;120;80;2;1;0;0;1;0
                    69999
                  70000 rows × 1 columns
In [3]: df 1=pd.read csv(r"C:\Users\arumu\Downloads\cardio train.csv",delimiter=';')
Out[3]:
                                           id
                                                       age
                                                                 gender height weight ap_hi ap_lo cholesterol
                                                                                                                                                                          gluc
                                                                                                                                                                                     smoke
                                                                                                                                                                                                      alco
                                                                                                                                                                                                                   active
                                                                                                                                                                                                                                  cardio
                             0
                                            0 18393
                                                                             2
                                                                                         168
                                                                                                        62.0
                                                                                                                        110
                                                                                                                                        80
                                                                                                                                                                                                 0
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                                                                                                                                                                                                                                             0
                             1
                                            1
                                                 20228
                                                                                         156
                                                                                                        85.0
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                                                                                                                                        90
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                                                                                                                                                                                                                                             1
                             2
                                            2 18857
                                                                             1
                                                                                         165
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                                                                                                                        130
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                                                 17623
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                                                                                         169
                                                                                                        82.0
                                                                                                                        150
                                                                                                                                       100
                                                                                                                                                                                                 0
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                             4
                                                17474
                                                                             1
                                                                                                        56.0
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                                                                                                                                        60
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                    69995 99993
                                                19240
                                                                             2
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                                                                                         168
                                                                                                        76.0
                                                                                                                        120
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                                                                                                                                                                                                 1
                    69996 99995
                                                 22601
                                                                                         158
                                                                                                      126.0
                                                                                                                        140
                                                                                                                                        90
                                                                                                                                                                    2
                                                                                                                                                                                                 0
                                                                                                                                                                                                             0
                    69997
                                  99996
                                                  19066
                                                                             2
                                                                                         183
                                                                                                      105.0
                                                                                                                        180
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                                                                                                                                                                                                                             0
                                                                                                                                                                                                                                             1
                    69998
                                  99998
                                                 22431
                                                                                         163
                                                                                                        72.0
                                                                                                                        135
                                                                                                                                        80
                                                                                                                                                                                                 0
                                                                                                                                                                                                             0
                                                                                         170
                                                                                                                                                                    2
                                                                                                                                                                                                 0
                                                                                                                                                                                                             0
                                                                                                                                                                                                                                             0
                    69999 99999 20540
                                                                                                        72.0
                                                                                                                        120
                                                                                                                                                                                1
                                                                                                                                                                                                                             1
                                                                                                                                        80
                  70000 rows × 13 columns
In [4]: # Select relevant features for the correlation matrix
                    relevant_features = ['age','gender', 'height', 'weight', 'ap_hi', 'ap_lo', 'cholesterol', 'gluc', 'smoke', 'alco
                    relevant_features
Out[4]: ['age',
                        'gender',
                        'height',
                       'weight',
                       'ap hi',
                       'ap_lo',
                        'cholesterol',
                        'gluc',
                       'smoke',
                       'alco',
                        'active'
                       'cardio']
In [8]: # Calculate of the correlation matrix
                    correlation matrix = df 1[relevant features].corr()
                    correlation matrix
```

t[8]:		age	gender	height	weight	ap_hi	ap_lo	cholesterol	gluc	smoke	alco	active
	age	1.000000	-0.022811	-0.081515	0.053684	0.020764	0.017647	0.154424	0.098703	-0.047633	-0.029723	-0.009927
	gender	-0.022811	1.000000	0.499033	0.155406	0.006005	0.015254	-0.035821	-0.020491	0.338135	0.170966	0.005866
	height	-0.081515	0.499033	1.000000	0.290968	0.005488	0.006150	-0.050226	-0.018595	0.187989	0.094419	-0.006570
	weight	0.053684	0.155406	0.290968	1.000000	0.030702	0.043710	0.141768	0.106857	0.067780	0.067113	-0.016867
	ap_hi	0.020764	0.006005	0.005488	0.030702	1.000000	0.016086	0.023778	0.011841	-0.000922	0.001408	-0.000033
	ap_lo	0.017647	0.015254	0.006150	0.043710	0.016086	1.000000	0.024019	0.010806	0.005186	0.010601	0.004780
	cholesterol	0.154424	-0.035821	-0.050226	0.141768	0.023778	0.024019	1.000000	0.451578	0.010354	0.035760	0.009911
	gluc	0.098703	-0.020491	-0.018595	0.106857	0.011841	0.010806	0.451578	1.000000	-0.004756	0.011246	-0.006770
	smoke	-0.047633	0.338135	0.187989	0.067780	-0.000922	0.005186	0.010354	-0.004756	1.000000	0.340094	0.025858

0.001408 0.010601

0.054475 0.065719

0.035760

0.221147

0.011246

0.089307

0.009911 -0.006770

0.340094

0.025858

-0.015486

1.000000

0.025476

-0.007330

0.025476

1.000000

-0.035653

1.0

0.0

In [9]: # Plotting the correlation heatmap plt.figure(figsize=(12, 8)) sns.heatmap(correlation matrix, annot=True, cmap='coolwarm', linewidths=0.5) plt.title('Correlation Matrix of Cardio Features', fontsize=16) plt.show()

## Correlation Matrix of Cardio Features -0.048 -0.023 -0.082 -0.0099 0.24 age gender --0.023 0.5 -0.02 0.34 - 0.8 height --0.082 0.5 0.29 0.19 0.094 -0.0066 0.29 weight --0.017 0.18 ap\_hi -0.021 0.006 0.00092 -3.3e-05 - 0.6 0.024 ap lo cholesterol --0.05 0.024 0.024 0.45 0.22 - 0.4 gluc - 0.099 0.45 -0.0048 -0.0068 smoke --0.048 0.34 0.19 0.00092 -0.0048 0.34 -0.015 - 0.2 0.34 alco -0.0014 0.011 -0.0073 active - -0.0099 -3.3e-05 0.0048 -0.0068 cardio -0.24 0.0081 -0.0110.18 0.054 0.22 -0.0073 -0.036 age gender height weight ap\_hi ap\_lo cholesterol gluc smoke alco active cardio

In [10]: # Display the correlation matrix print(correlation matrix)

alco

cardio

-0.029723

0.238159

active -0.009927

0.170966

0.008109

0.094419

-0.010821

0.067113

0.005866 -0.006570 -0.016867 -0.000033 0.004780

0.181660

```
gender
                                    height
                                              weight
                                                          ap hi
                                                                     ap_lo \
                  age
             1.000000 -0.022811 -0.081515 0.053684 0.020764 0.017647
age
            -0.022811 1.000000 0.499033 0.155406 0.006005
gender
                                                                 0.015254
            -0.081515 0.499033 1.000000 0.290968 0.005488 0.006150
height
             0.053684 0.155406 0.290968 1.000000 0.030702
weight
                                                                 0.043710
             0.020764 0.006005 0.005488 0.030702 1.000000
ap_hi
                                                                 0.016086
ap_lo
             0.017647 0.015254 0.006150 0.043710
                                                       0.016086
                                                                 1.000000
cholesterol 0.154424 -0.035821 -0.050226 0.141768 0.023778
                                                                 0.024019
             0.098703 -0.020491 -0.018595 0.106857 0.011841
gluc
            -0.047633   0.338135   0.187989   0.067780   -0.000922
                                                                 0.005186
smoke
            -0.029723 0.170966 0.094419 0.067113 0.001408
alco
                                                                 0.010601
            \hbox{-0.009927} \quad \hbox{0.005866} \quad \hbox{-0.006570} \quad \hbox{-0.016867} \quad \hbox{-0.000033} \quad \hbox{0.004780}
active
             0.238159 0.008109 -0.010821 0.181660 0.054475 0.065719
cardio
             cholesterol
                               gluc
                                        smoke
                                                    alco
                                                            active
                                                                       cardio
                age
               -0.035821 -0.020491 0.338135 0.170966 0.005866 0.008109
gender
height
               -0.050226 -0.018595 0.187989 0.094419 -0.006570 -0.010821
weight
                0.141768 \quad 0.106857 \quad 0.067780 \quad 0.067113 \quad -0.016867 \quad 0.181660
                0.023778 \quad 0.011841 \ -0.000922 \quad 0.001408 \ -0.000033 \quad 0.054475
ap_hi
                0.024019 0.010806 0.005186 0.010601 0.004780 0.065719
ap lo
cholesterol
                1.000000 0.451578 0.010354 0.035760 0.009911 0.221147
                0.451578 1.000000 -0.004756
                                               0.011246 -0.006770
                                                                   0.089307
gluc
                0.010354 \ -0.004756 \ 1.000000 \ 0.340094 \ 0.025858 \ -0.015486
smoke
alco
                0.035760 \quad 0.011246 \quad 0.340094 \quad 1.000000 \quad 0.025476 \quad -0.007330
                0.009911 \ -0.006770 \ \ 0.025858 \ \ 0.025476 \ \ 1.000000 \ -0.035653
active
cardio
                0.221147 \quad 0.089307 \ -0.015486 \ -0.007330 \ -0.035653 \quad 1.000000
```

In [ ]:

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