EDA

In [2]:
```
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
import pandas as pd
df=pd.read_csv("Book2.csv")
df
```

Out[2]:

	Column1	ID	Salary	DOJ	DOL	Designation	JobCity	Gender	DOB	10percentage	...	ComputerScience	Mechani
0	train	203097	420000	06-01-2012 00:00	present	senior quality engineer	Bangalore	f	2/19/90 0:00	84.30	...	-1	
1	train	579905	500000	09-01-2013 00:00	present	assistant manager	Indore	m	10/4/89 0:00	85.40	...	-1	
2	train	810601	325000	06-01-2014 00:00	present	systems engineer	Chennai	f	8/3/92 0:00	85.00	...	-1	
3	train	267447	1100000	07-01-2011 00:00	present	senior software engineer	Gurgaon	m	12/5/89 0:00	85.60	...	-1	
4	train	343523	200000	03-01-2014 00:00	3/1/15 0:00	get	Manesar	m	2/27/91 0:00	78.00	...	-1	
...	...	...	...	...	...	...	...	...	...	...	...	...	
3993	train	47916	280000	10-01-2011 00:00	10/1/12 0:00	software engineer	New Delhi	m	4/15/87 0:00	52.09	...	-1	
3994	train	752781	100000	07-01-2013 00:00	7/1/13 0:00	technical writer	Hyderabad	f	8/27/92 0:00	90.00	...	-1	
3995	train	355888	320000	07-01-2013 00:00	present	associate software engineer	Bangalore	m	7/3/91 0:00	81.86	...	-1	
3996	train	947111	200000	07-01-2014 00:00	1/1/15 0:00	software developer	Asifabadbanglore	f	3/20/92 0:00	78.72	...	438	
3997	train	324966	400000	02-01-2013 00:00	present	senior systems engineer	Chennai	f	2/26/91 0:00	70.60	...	-1	

3998 rows × 39 columns

In [3]:
```
#shape
df.shape
```

Out[3]:
```
(3998, 39)
```

In [4]:
```
#size
df.size
```

Out[4]:
```
155922
```

In [5]:
```
df.head()
```

Out[5]:

	Column1	ID	Salary	DOJ	DOL	Designation	JobCity	Gender	DOB	10percentage	...	ComputerScience	MechanicalEngg
0	train	203097	420000	06-01-2012 00:00	present	senior quality engineer	Bangalore	f	2/19/90 0:00	84.3	...	-1	-1
1	train	579905	500000	09-01-2013 00:00	present	assistant manager	Indore	m	10/4/89 0:00	85.4	...	-1	-1
2	train	810601	325000	06-01-2014 00:00	present	systems engineer	Chennai	f	8/3/92 0:00	85.0	...	-1	-1
3	train	267447	1100000	07-01-2011 00:00	present	senior software engineer	Gurgaon	m	12/5/89 0:00	85.6	...	-1	-1
4	train	343523	200000	03-01-2014 00:00	3/1/15 0:00	get	Manesar	m	2/27/91 0:00	78.0	...	-1	-1

5 rows × 39 columns

In [6]:
```
df.columns=df.columns.str.lower()
```

In [7]:
```
#categorical columns
cat_columns=df.select_dtypes(include='object').columns
cat_columns
```

Out[7]:
```
Index(['column1', 'doj', 'dol', 'designation', 'jobcity', 'gender', 'dob',
       '10board', '12board', 'degree', 'specialization', 'collegestate'],
      dtype='object')
```

In [8]:
```
len(cat_columns)
```

Out[8]:
```
12
```

In [9]:
```
#numerical columns
num_columns=df.select_dtypes(exclude='object').columns
num_columns
```

Out[9]:
```
Index(['id', 'salary', '10percentage', '12graduation', '12percentage',
       'collegeid', 'collegetier', 'collegegpa', 'collegecityid',
       'collegecitytier', 'graduationyear', 'english', 'logical', 'quant',
       'domain', 'computerprogramming', 'electronicsandsemicon',
       'computerscience', 'mechanicalengg', 'electricalengg', 'telecomengg',
       'civilengg', 'conscientiousness', 'agreeableness', 'extraversion',
       'nueroticism', 'openess_to_experience'],
      dtype='object')
```

In [10]:
```
#Univariate analysis
#drop ID column
num_col=df.drop(columns=["id"])
num_col
```

Out[10]:

	column1	salary	doj	dol	designation	jobcity	gender	dob	10percentage	10board	...	computerscience	mecl
0	train	420000	06-01-2012 00:00	present	senior quality engineer	Bangalore	f	2/19/90 0:00	84.30	board ofsecondary education,ap	...	-1	
1	train	500000	09-01-2013 00:00	present	assistant manager	Indore	m	10/4/89 0:00	85.40	cbse	...	-1	
2	train	325000	06-01-2014 00:00	present	systems engineer	Chennai	f	8/3/92 0:00	85.00	cbse	...	-1	
3	train	1100000	07-01-2011 00:00	present	senior software engineer	Gurgaon	m	12/5/89 0:00	85.60	cbse	...	-1	
4	train	200000	03-01-2014 00:00	3/1/15 0:00	get	Manesar	m	2/27/91 0:00	78.00	cbse	...	-1	
...	...	...	...	...	...	...	...	...	...	...	...	...	
3993	train	280000	10-01-2011 00:00	10/1/12 0:00	software engineer	New Delhi	m	4/15/87 0:00	52.09	cbse	...	-1	
3994	train	100000	07-01-2013 00:00	7/1/13 0:00	technical writer	Hyderabad	f	8/27/92 0:00	90.00	state board	...	-1	
3995	train	320000	07-01-2013 00:00	present	associate software engineer	Bangalore	m	7/3/91 0:00	81.86	bse,odisha	...	-1	
3996	train	200000	07-01-2014 00:00	1/1/15 0:00	software developer	Asifabadbanglore	f	3/20/92 0:00	78.72	state board	...	438	
3997	train	400000	02-01-2013 00:00	present	senior systems engineer	Chennai	f	2/26/91 0:00	70.60	cbse	...	-1	

3998 rows × 38 columns

In [11]:
```
num_col.describe()
```

Out[11]:

	salary	10percentage	12graduation	12percentage	collegeid	collegetier	collegegpa	collegecityid	collegecitytier	gradua
count	3.998000e+03	3998.000000	3998.000000	3998.000000	3998.000000	3998.000000	3998.000000	3998.000000	3998.000000	399
mean	3.076998e+05	77.925443	2008.087544	74.466366	5156.851426	1.925713	71.486171	5156.851426	0.300400	201
std	2.127375e+05	9.850162	1.653599	10.999933	4802.261482	0.262270	8.167338	4802.261482	0.458489	3
min	3.500000e+04	43.000000	1995.000000	40.000000	2.000000	1.000000	6.450000	2.000000	0.000000	
25%	1.800000e+05	71.680000	2007.000000	66.000000	494.000000	2.000000	66.407500	494.000000	0.000000	201
50%	3.000000e+05	79.150000	2008.000000	74.400000	3879.000000	2.000000	71.720000	3879.000000	0.000000	201
75%	3.700000e+05	85.670000	2009.000000	82.600000	8818.000000	2.000000	76.327500	8818.000000	1.000000	201
max	4.000000e+06	97.760000	2013.000000	98.700000	18409.000000	2.000000	99.930000	18409.000000	1.000000	201

8 rows × 26 columns

In [12]:
```
#Skewness
for i in num_columns[1:]:
    skew=round(df[i].skew(),2)
    print(f"skew of column{i}  is '{skew}'")
```

```
skew of columnsalary  is '6.45'
skew of column10percentage  is '-0.59'
skew of column12graduation  is '-0.96'
skew of column12percentage  is '-0.03'
skew of columncollegeid  is '0.65'
skew of columncollegetier  is '-3.25'
skew of columncollegegpa  is '-1.25'
skew of columncollegecityid  is '0.65'
skew of columncollegecitytier  is '0.87'
skew of columngraduationyear  is '-63.07'
skew of columnenglish  is '0.19'
skew of columnlogical  is '-0.22'
skew of columnquant  is '-0.02'
skew of columndomain  is '-1.92'
skew of columncomputerprogramming  is '-0.78'
skew of columnelectronicsandsemicon  is '1.2'
skew of columncomputerscience  is '1.53'
skew of columnmechanicalengg  is '4.03'
skew of columnelectricalengg  is '5.06'
skew of columntelecomengg  is '3.04'
skew of columncivilengg  is '10.32'
skew of columnconscientiousness  is '-0.53'
skew of columnagreeableness  is '-1.2'
skew of columnextraversion  is '-0.52'
skew of columnnueroticism  is '0.17'
skew of columnopeness_to_experience  is '-1.51'
```

In [13]:
```
#Kurtosis os each column
for i in num_columns[1:]:
    kurt=round(df[i].kurt(),2)
    print(f"Kurtosis of col{i} is'{kurt}'")
```

```
Kurtosis of colsalary is'80.93'
Kurtosis of col10percentage is'-0.11'
Kurtosis of col12graduation is'1.95'
Kurtosis of col12percentage is'-0.63'
Kurtosis of colcollegeid is'-0.77'
Kurtosis of colcollegetier is'8.55'
Kurtosis of colcollegegpa is'10.23'
Kurtosis of colcollegecityid is'-0.77'
Kurtosis of colcollegecitytier is'-1.24'
Kurtosis of colgraduationyear is'3984.37'
Kurtosis of colenglish is'-0.25'
Kurtosis of collogical is'-0.22'
Kurtosis of colquant is'-0.1'
Kurtosis of coldomain is'3.9'
Kurtosis of colcomputerprogramming is'-0.67'
Kurtosis of colelectronicsandsemicon is'-0.21'
Kurtosis of colcomputerscience is'0.69'
Kurtosis of colmechanicalengg is'15.02'
Kurtosis of colelectricalengg is'24.88'
Kurtosis of coltelecomengg is'7.81'
Kurtosis of colcivilengg is'109.04'
Kurtosis of colconscientiousness is'0.12'
Kurtosis of colagreeableness is'3.39'
Kurtosis of colextraversion is'0.64'
Kurtosis of colnueroticism is'-0.19'
Kurtosis of colopeness_to_experience is'5.79'
```

In [14]:
```
cov_matrix = df.select_dtypes(include=[np.number]).cov()
print(cov_matrix)
```

```
                                id        salary   10percentage  \
id                    1.319275e+11 -1.910842e+10  159378.051803
salary               -1.910842e+10  4.525724e+10  371684.456159
10percentage          1.593781e+05  3.716845e+05      97.025700
12graduation          4.042768e+05 -5.677157e+04       4.397119
12percentage          2.824308e+04  3.984122e+05      69.710710
collegeid             4.963137e+08 -1.212565e+08     997.261052
collegetier           3.349438e+03 -1.000579e+04      -0.325618
collegegpa            1.398544e+05  2.260530e+05      25.143547
collegecityid         4.963137e+08 -1.212565e+08     997.261052
collegecitytier      -5.991252e+03  1.500495e+03       0.527071
graduationyear        3.186574e+05 -6.813186e+04      -4.330051
english               5.164917e+06  3.978683e+06     362.593281
logical               3.221944e+06  3.309785e+06     270.138109
quant                -2.449201e+06  6.000532e+06     382.660566
domain               -2.138752e+04  1.043457e+04       0.362683
computerprogramming   1.406654e+06  5.053027e+06     108.421537
electronicsandsemicon -6.644284e+06  2.240082e+04     132.769360
computerscience       3.072515e+07 -3.755551e+06     -32.687912
mechanicalengg       -9.318690e+05  3.856527e+05      48.678119
electricalengg        3.322958e+06 -8.868903e+05      64.203771
telecomengg          -1.876479e+06 -5.061435e+05      50.998564
civilengg            -2.379522e+05  2.935306e+05      10.833465
conscientiousness     6.559340e+04 -1.403798e+04       0.685534
agreeableness         8.496059e+03  1.150482e+04       1.267615
extraversion          4.180926e+04 -2.067186e+03      -0.043855
nueroticism          -5.353756e+04 -1.172182e+04      -1.314998
```

```
openess_to_experience  1.148209e+04 -2.425976e+03       0.364343

                         12graduation   12percentage     collegeid  \
id                       404276.838583   28243.078928  4.963137e+08
salary                   -56771.565543  398412.208861 -1.212565e+08
10percentage                  4.397119      69.710710  9.972611e+02
12graduation                  2.734391       4.714096  2.017185e+03
12percentage                  4.714096     120.998528  1.179912e+03
collegeid                  2017.184639    1179.911862  2.306172e+07
collegetier                   0.012009      -0.290720  8.445431e+01
collegegpa                    1.161489      31.096999  6.761679e+02
collegecityid              2017.184639    1179.911862  2.306172e+07
collegecitytier              -0.002287       0.657967  1.707967e+01
graduationyear                0.761563      -4.532195 -2.638458e+01
english                      25.669208     245.744098 -1.148619e+04
logical                      15.195251     232.515001 -1.962685e+04
quant                         0.278868     420.294392 -6.735002e+04
domain                       -0.026476       0.382008 -1.662287e+02
computerprogramming          -16.297969     182.558565 -3.329351e+04
electronicsandsemicon         -1.541392     203.850411 -1.553103e+04
computerscience               85.047828     -83.932520  8.610934e+04
mechanicalengg                 5.753526      40.621034 -4.378244e+03
electricalengg                17.923053      61.660745  9.645816e+03
telecomengg                    4.069324      50.980677  1.290070e+04
civilengg                     -0.286551       2.383094  1.012081e+03
conscientiousness              0.175763       0.659664  3.775682e+02
agreeableness                  0.064135       1.077373 -2.380609e+01
extraversion                   0.097479      -0.078347  2.703415e+01
nueroticism                   -0.123908      -1.045919 -4.341715e+01
openess_to_experience         -0.025119       0.070213 -5.169028e+01

                          collegetier     collegegpa  collegecityid  \
id                       3349.438212  139854.366484   4.963137e+08
salary                -10005.790486  226052.995923  -1.212565e+08
10percentage             -0.325618      25.143547   9.972611e+02
12graduation              0.012009       1.161489   2.017185e+03
12percentage             -0.290720      31.096999   1.179912e+03
collegeid                84.454309     676.167910   2.306172e+07
collegetier               0.068786      -0.185889   8.445431e+01
collegegpa               -0.185889      66.705404   6.761679e+02
collegecityid            84.454309     676.167910   2.306172e+07
collegecitytier          -0.012204       0.065421   1.707967e+01
graduationyear           -0.046429       2.265281  -2.638458e+01
english                  -5.059851      91.260290  -1.148619e+04
logical                  -4.160910     139.354778  -1.962685e+04
quant                    -8.054460     217.137676  -6.735002e+04
domain                   -0.007552       0.410539  -1.662287e+02
computerprogramming      -3.966342     229.100139  -3.329351e+04
electronicsandsemicon    -1.310348      38.584726  -1.553103e+04
computerscience           0.048407      10.880967   8.610934e+04
mechanicalengg           -0.554542     -25.456707  -4.378244e+03
electricalengg            0.059591      37.382367   9.645816e+03
telecomengg               0.000200      -4.475103   1.290070e+04
civilengg                -0.324218      -5.673773   1.012081e+03
conscientiousness         0.014885       0.584587   3.775682e+02
agreeableness            -0.009400       0.525213  -2.380609e+01
extraversion              0.002488      -0.253988   2.703415e+01
nueroticism               0.006284      -0.616035  -4.341715e+01
openess_to_experience    -0.005071       0.231115  -5.169028e+01

                         collegecitytier  ...  computerscience  mechanicalengg  \
id                          -5991.252230  ...     3.072515e+07  -931869.041883
salary                       1500.495432  ...    -3.755551e+06   385652.660706
10percentage                    0.527071  ...    -3.268791e+01       48.678119
12graduation                   -0.002287  ...     8.504783e+01        5.753526
12percentage                    0.657967  ...    -8.393252e+01       40.621034
collegeid                      17.079669  ...     8.610934e+04    -4378.244435
collegetier                    -0.012204  ...     4.840737e-02       -0.554542
collegegpa                      0.065421  ...     1.088097e+01      -25.456707
collegecityid                  17.079669  ...     8.610934e+04    -4378.244435
collegecitytier                 0.210212  ...    -8.552884e-01       -2.357183
graduationyear                  0.119072  ...     1.345049e+02     -208.949791
english                         2.427936  ...     1.094388e+03      -25.504990
logical                         0.809818  ...     6.765949e+02      -83.975112
quant                           0.442781  ...    -9.298783e+02      239.207955
domain                          0.001988  ...     4.827045e+00        2.229099
computerprogramming             6.051422  ...     9.107722e+03    -5740.597853
electronicsandsemicon           2.980629  ...    -7.591367e+03    -1699.196105
computerscience                -0.855288  ...     3.072065e+04    -2138.701531
mechanicalengg                 -2.357183  ...    -2.138702e+03     9628.184250
electricalengg                  0.414069  ...    -1.286421e+03     -348.250350
telecomengg                     2.397733  ...    -2.721675e+03     -729.942715
civilengg                      -0.561244  ...    -3.380489e+02      274.099592
conscientiousness               0.006963  ...     1.625467e+01       -1.095935
agreeableness                   0.002403  ...     6.580696e+00       -2.641643
extraversion                   -0.003578  ...     1.703584e+01       -1.657003
nueroticism                     0.002052  ...    -1.989447e+01        3.573884
openess_to_experience          -0.007760  ...     1.025486e+01       -2.768478
```

	electricalengg	telecomengg	civilengg	\
id	3.322958e+06	-1.876479e+06	-237952.207851	
salary	-8.868903e+05	-5.061435e+05	293530.550489	
10percentage	6.420377e+01	5.099856e+01	10.833465	
12graduation	1.792305e+01	4.069324e+00	-0.286551	
12percentage	6.166074e+01	5.098068e+01	2.383094	
collegeid	9.645816e+03	1.290070e+04	1012.081362	
collegetier	5.959109e-02	1.999373e-04	-0.324218	
collegegpa	3.738237e+01	-4.475103e+00	-5.673773	
collegecityid	9.645816e+03	1.290070e+04	1012.081362	
collegecitytier	4.140691e-01	2.397733e+00	-0.561244	
graduationyear	2.378671e+01	1.411507e+01	1.980169	
english	2.981455e+02	-6.405849e+01	-29.714678	
logical	9.123815e+01	-1.178150e+02	-35.906209	
quant	2.246815e+02	2.742630e+02	2.365782	
domain	1.759970e+00	1.201130e+00	0.301847	
computerprogramming	-2.486120e+03	-5.345745e+03	-664.341271	
electronicsandsemicon	5.123694e+02	6.423440e+03	16.605733	
computerscience	-1.286421e+03	-2.721675e+03	-338.048947	
mechanicalengg	-3.482503e+02	-7.299427e+02	274.099592	
electricalengg	7.671243e+03	-4.726665e+02	-64.405022	
telecomengg	-4.726665e+02	1.099412e+04	-121.048815	
civilengg	-6.440502e+01	-1.210488e+02	1343.845979	
conscientiousness	2.685442e+00	-5.334358e-01	-0.660911	
agreeableness	-1.274755e+00	-1.444439e+00	-1.182602	
extraversion	3.722801e-01	-3.895795e+00	-1.109929	
nueroticism	-2.724256e+00	2.180398e+00	0.389861	
openess_to_experience	-1.111177e+00	-1.491966e-02	-1.153006	

	conscientiousness	agreeableness	extraversion	\
id	65593.400265	8496.058635	41809.257150	
salary	-14037.983625	11504.821563	-2067.186195	
10percentage	0.685534	1.267615	-0.043855	
12graduation	0.175763	0.064135	0.097479	
12percentage	0.659664	1.077373	-0.078347	
collegeid	377.568165	-23.806085	27.034147	
collegetier	0.014885	-0.009400	0.002488	
collegegpa	0.584587	0.525213	-0.253988	
collegecityid	377.568165	-23.806085	27.034147	
collegecitytier	0.006963	0.002403	-0.003578	
graduationyear	-0.433725	-0.086324	0.254526	
english	3.772022	19.270980	1.872663	
logical	2.309967	13.666005	-0.573754	
quant	-0.709410	11.914767	-3.329959	
domain	-0.019032	0.022927	-0.010991	
computerprogramming	2.717050	14.879090	8.500256	
electronicsandsemicon	-4.310882	-3.619239	-6.693617	
computerscience	16.254671	6.580696	17.035838	
mechanicalengg	-1.095935	-2.641643	-1.657003	
electricalengg	2.685442	-1.274755	0.372280	
telecomengg	-0.533436	-1.444439	-3.895795	
civilengg	-0.660911	-1.182602	-1.109929	
conscientiousness	1.058153	0.466777	0.347980	
agreeableness	0.466777	0.886954	0.407150	
extraversion	0.347980	0.407150	0.905298	
nueroticism	-0.342356	-0.196882	-0.092504	
openess_to_experience	0.410277	0.561601	0.417303	

	nueroticism	openess_to_experience
id	-53537.564434	11482.092235
salary	-11721.817357	-2425.975501
10percentage	-1.314998	0.364343
12graduation	-0.123908	-0.025119
12percentage	-1.045919	0.070213
collegeid	-43.417151	-51.690285
collegetier	0.006284	-0.005071
collegegpa	-0.616035	0.231115
collegecityid	-43.417151	-51.690285
collegecitytier	0.002052	-0.007760
graduationyear	-0.013375	0.541276
english	-16.444814	7.191299
logical	-15.632782	4.236020
quant	-16.253350	2.512329
domain	-0.008466	0.004919
computerprogramming	-17.451760	8.929076
electronicsandsemicon	3.352440	-2.147063
computerscience	-19.894473	10.254859
mechanicalengg	3.573884	-2.768478
electricalengg	-2.724256	-1.111177
telecomengg	2.180398	-0.014920
civilengg	0.389861	-1.153006
conscientiousness	-0.342356	0.410277
agreeableness	-0.196882	0.561601
extraversion	-0.092504	0.417303
nueroticism	1.015217	-0.066829
openess_to_experience	-0.066829	1.016214

[27 rows x 27 columns]

In [15]:
```
df_numeric = df.apply(pd.to_numeric, errors='coerce')
cov_matrix = df_numeric.cov()
print(cov_matrix)
```

```
                         column1            id        salary  doj  dol  \
column1                      NaN           NaN           NaN  NaN  NaN
id                           NaN  1.319275e+11 -1.910842e+10  NaN  NaN
salary                       NaN -1.910842e+10  4.525724e+10  NaN  NaN
doj                          NaN           NaN           NaN  NaN  NaN
dol                          NaN           NaN           NaN  NaN  NaN
designation                  NaN           NaN           NaN  NaN  NaN
jobcity                      NaN  0.000000e+00  0.000000e+00  NaN  NaN
gender                       NaN           NaN           NaN  NaN  NaN
dob                          NaN           NaN           NaN  NaN  NaN
10percentage                 NaN  1.593781e+05  3.716845e+05  NaN  NaN
10board                      NaN  0.000000e+00  0.000000e+00  NaN  NaN
12graduation                 NaN  4.042768e+05 -5.677157e+04  NaN  NaN
12percentage                 NaN  2.824308e+04  3.984122e+05  NaN  NaN
12board                      NaN  0.000000e+00  0.000000e+00  NaN  NaN
collegeid                    NaN  4.963137e+08 -1.212565e+08  NaN  NaN
collegetier                  NaN  3.349438e+03 -1.000579e+04  NaN  NaN
degree                       NaN           NaN           NaN  NaN  NaN
specialization               NaN           NaN           NaN  NaN  NaN
collegegpa                   NaN  1.398544e+05  2.260530e+05  NaN  NaN
collegecityid                NaN  4.963137e+08 -1.212565e+08  NaN  NaN
collegecitytier              NaN -5.991252e+03  1.500495e+03  NaN  NaN
collegestate                 NaN           NaN           NaN  NaN  NaN
graduationyear               NaN  3.186574e+05 -6.813186e+04  NaN  NaN
english                      NaN  5.164917e+06  3.978683e+06  NaN  NaN
logical                      NaN  3.221944e+06  3.309785e+06  NaN  NaN
quant                        NaN -2.449201e+06  6.000532e+06  NaN  NaN
domain                       NaN -2.138752e+04  1.043457e+04  NaN  NaN
computerprogramming          NaN  1.406654e+06  5.053027e+06  NaN  NaN
electronicsandsemicon        NaN -6.644284e+06  2.240082e+04  NaN  NaN
computerscience              NaN  3.072515e+07 -3.755551e+06  NaN  NaN
mechanicalengg               NaN -9.318690e+05  3.856527e+05  NaN  NaN
electricalengg               NaN  3.322958e+06 -8.868903e+05  NaN  NaN
telecomengg                  NaN -1.876479e+06 -5.061435e+05  NaN  NaN
civilengg                    NaN -2.379522e+05  2.935306e+05  NaN  NaN
conscientiousness            NaN  6.559340e+04 -1.403798e+04  NaN  NaN
agreeableness                NaN  8.496059e+03  1.150482e+04  NaN  NaN
extraversion                 NaN  4.180926e+04 -2.067186e+03  NaN  NaN
nueroticism                  NaN -5.353756e+04 -1.172182e+04  NaN  NaN
openess_to_experience        NaN  1.148209e+04 -2.425976e+03  NaN  NaN

                         designation  jobcity  gender  dob   10percentage  ...  \
column1                          NaN      NaN     NaN  NaN            NaN  ...
id                               NaN      0.0     NaN  NaN  159378.051803  ...
salary                           NaN      0.0     NaN  NaN  371684.456159  ...
doj                              NaN      NaN     NaN  NaN            NaN  ...
dol                              NaN      NaN     NaN  NaN            NaN  ...
designation                      NaN      NaN     NaN  NaN            NaN  ...
jobcity                          NaN      0.0     NaN  NaN       0.000000  ...
gender                           NaN      NaN     NaN  NaN            NaN  ...
dob                              NaN      NaN     NaN  NaN            NaN  ...
10percentage                     NaN      0.0     NaN  NaN      97.025700  ...
10board                          NaN      0.0     NaN  NaN       0.000000  ...
12graduation                     NaN      0.0     NaN  NaN       4.397119  ...
12percentage                     NaN      0.0     NaN  NaN      69.710710  ...
12board                          NaN      0.0     NaN  NaN       0.000000  ...
collegeid                        NaN      0.0     NaN  NaN     997.261052  ...
collegetier                      NaN      0.0     NaN  NaN      -0.325618  ...
degree                           NaN      NaN     NaN  NaN            NaN  ...
specialization                   NaN      NaN     NaN  NaN            NaN  ...
collegegpa                       NaN      0.0     NaN  NaN      25.143547  ...
collegecityid                    NaN      0.0     NaN  NaN     997.261052  ...
collegecitytier                  NaN      0.0     NaN  NaN       0.527071  ...
collegestate                     NaN      NaN     NaN  NaN            NaN  ...
graduationyear                   NaN      0.0     NaN  NaN      -4.330051  ...
english                          NaN      0.0     NaN  NaN     362.593281  ...
logical                          NaN      0.0     NaN  NaN     270.138109  ...
quant                            NaN      0.0     NaN  NaN     382.660566  ...
domain                           NaN      0.0     NaN  NaN       0.362683  ...
computerprogramming              NaN      0.0     NaN  NaN     108.421537  ...
electronicsandsemicon            NaN      0.0     NaN  NaN     132.769360  ...
computerscience                  NaN      0.0     NaN  NaN     -32.687912  ...
mechanicalengg                   NaN      0.0     NaN  NaN      48.678119  ...
electricalengg                   NaN      0.0     NaN  NaN      64.203771  ...
telecomengg                      NaN      0.0     NaN  NaN      50.998564  ...
civilengg                        NaN      0.0     NaN  NaN      10.833465  ...
conscientiousness                NaN      0.0     NaN  NaN       0.685534  ...
agreeableness                    NaN      0.0     NaN  NaN       1.267615  ...
extraversion                     NaN      0.0     NaN  NaN      -0.043855  ...
nueroticism                      NaN      0.0     NaN  NaN      -1.314998  ...
openess_to_experience            NaN      0.0     NaN  NaN       0.364343  ...

                         computerscience  mechanicalengg  electricalengg  \
column1                              NaN             NaN             NaN
id                          3.072515e+07  -931869.041883    3.322958e+06
```

salary	-3.755551e+06	385652.660706	-8.868903e+05
doj	NaN	NaN	NaN
dol	NaN	NaN	NaN
designation	NaN	NaN	NaN
jobcity	0.000000e+00	0.000000	0.000000e+00
gender	NaN	NaN	NaN
dob	NaN	NaN	NaN
10percentage	-3.268791e+01	48.678119	6.420377e+01
10board	0.000000e+00	0.000000	0.000000e+00
12graduation	8.504783e+01	5.753526	1.792305e+01
12percentage	-8.393252e+01	40.621034	6.166074e+01
12board	0.000000e+00	0.000000	0.000000e+00
collegeid	8.610934e+04	-4378.244435	9.645816e+03
collegetier	4.840737e-02	-0.554542	5.959109e-02
degree	NaN	NaN	NaN
specialization	NaN	NaN	NaN
collegegpa	1.088097e+01	-25.456707	3.738237e+01
collegecityid	8.610934e+04	-4378.244435	9.645816e+03
collegecitytier	-8.552884e-01	-2.357183	4.140691e-01
collegestate	NaN	NaN	NaN
graduationyear	1.345049e+02	-208.949791	2.378671e+01
english	1.094388e+03	-25.504990	2.981455e+02
logical	6.765949e+02	-83.975112	9.123815e+01
quant	-9.298783e+02	239.207955	2.246815e+02
domain	4.827045e+00	2.229099	1.759970e+00
computerprogramming	9.107722e+03	-5740.597853	-2.486120e+03
electronicsandsemicon	-7.591367e+03	-1699.196105	5.123694e+02
computerscience	3.072065e+04	-2138.701531	-1.286421e+03
mechanicalengg	-2.138702e+03	9628.184250	-3.482503e+02
electricalengg	-1.286421e+03	-348.250350	7.671243e+03
telecomengg	-2.721675e+03	-729.942715	-4.726665e+02
civilengg	-3.380489e+02	274.099592	-6.440502e+01
conscientiousness	1.625467e+01	-1.095935	2.685442e+00
agreeableness	6.580696e+00	-2.641643	-1.274755e+00
extraversion	1.703584e+01	-1.657003	3.722801e-01
nueroticism	-1.989447e+01	3.573884	-2.724256e+00
openess_to_experience	1.025486e+01	-2.768478	-1.111177e+00

	telecomengg	civilengg	conscientiousness
column1	NaN	NaN	NaN
id	-1.876479e+06	-237952.207851	65593.400265
salary	-5.061435e+05	293530.550489	-14037.983625
doj	NaN	NaN	NaN
dol	NaN	NaN	NaN
designation	NaN	NaN	NaN
jobcity	0.000000e+00	0.000000	0.000000
gender	NaN	NaN	NaN
dob	NaN	NaN	NaN
10percentage	5.099856e+01	10.833465	0.685534
10board	0.000000e+00	0.000000	0.000000
12graduation	4.069324e+00	-0.286551	0.175763
12percentage	5.098068e+01	2.383094	0.659664
12board	0.000000e+00	0.000000	0.000000
collegeid	1.290070e+04	1012.081362	377.568165
collegetier	1.999373e-04	-0.324218	0.014885
degree	NaN	NaN	NaN
specialization	NaN	NaN	NaN
collegegpa	-4.475103e+00	-5.673773	0.584587
collegecityid	1.290070e+04	1012.081362	377.568165
collegecitytier	2.397733e+00	-0.561244	0.006963
collegestate	NaN	NaN	NaN
graduationyear	1.411507e+01	1.980169	-0.433725
english	-6.405849e+01	-29.714678	3.772022
logical	-1.178150e+02	-35.906209	2.309967
quant	2.742630e+02	2.365782	-0.709410
domain	1.201130e+00	0.301847	-0.019032
computerprogramming	-5.345745e+03	-664.341271	2.717050
electronicsandsemicon	6.423440e+03	16.605733	-4.310882
computerscience	-2.721675e+03	-338.048947	16.254671
mechanicalengg	-7.299427e+02	274.099592	-1.095935
electricalengg	-4.726665e+02	-64.405022	2.685442
telecomengg	1.099412e+04	-121.048815	-0.533436
civilengg	-1.210488e+02	1343.845979	-0.660911
conscientiousness	-5.334358e-01	-0.660911	1.058153
agreeableness	-1.444439e+00	-1.182602	0.466777
extraversion	-3.895795e+00	-1.109929	0.347980
nueroticism	2.180398e+00	0.389861	-0.342356
openess_to_experience	-1.491966e-02	-1.153006	0.410277

	agreeableness	extraversion	nueroticism
column1	NaN	NaN	NaN
id	8496.058635	41809.257150	-53537.564434
salary	11504.821563	-2067.186195	-11721.817357
doj	NaN	NaN	NaN
dol	NaN	NaN	NaN
designation	NaN	NaN	NaN
jobcity	0.000000	0.000000	0.000000
gender	NaN	NaN	NaN
dob	NaN	NaN	NaN

```
10percentage                1.267615     -0.043855     -1.314998
10board                     0.000000      0.000000      0.000000
12graduation                0.064135      0.097479     -0.123908
12percentage                1.077373     -0.078347     -1.045919
12board                     0.000000      0.000000      0.000000
collegeid                 -23.806085     27.034147    -43.417151
collegetier                 -0.009400      0.002488      0.006284
degree                            NaN           NaN           NaN
specialization                    NaN           NaN           NaN
collegegpa                  0.525213     -0.253988     -0.616035
collegecityid             -23.806085     27.034147    -43.417151
collegecitytier             0.002403     -0.003578      0.002052
collegestate                      NaN           NaN           NaN
graduationyear             -0.086324      0.254526     -0.013375
english                    19.270980      1.872663    -16.444814
logical                    13.666005     -0.573754    -15.632782
quant                      11.914767     -3.329959    -16.253350
domain                      0.022927     -0.010991     -0.008466
computerprogramming        14.879090      8.500256    -17.451760
electronicsandsemicon      -3.619239     -6.693617      3.352440
computerscience             6.580696     17.035838    -19.894473
mechanicalengg             -2.641643     -1.657003      3.573884
electricalengg             -1.274755      0.372280     -2.724256
telecomengg                -1.444439     -3.895795      2.180398
civilengg                  -1.182602     -1.109929      0.389861
conscientiousness           0.466777      0.347980     -0.342356
agreeableness               0.886954      0.407150     -0.196882
extraversion                0.407150      0.905298     -0.092504
nueroticism                -0.196882     -0.092504      1.015217
openess_to_experience       0.561601      0.417303     -0.066829

                        openess_to_experience
column1                                   NaN
id                                11482.092235
salary                            -2425.975501
doj                                       NaN
dol                                       NaN
designation                               NaN
jobcity                              0.000000
gender                                    NaN
dob                                       NaN
10percentage                         0.364343
10board                              0.000000
12graduation                        -0.025119
12percentage                         0.070213
12board                              0.000000
collegeid                          -51.690285
collegetier                         -0.005071
degree                                    NaN
specialization                            NaN
collegegpa                           0.231115
collegecityid                      -51.690285
collegecitytier                     -0.007760
collegestate                              NaN
graduationyear                       0.541276
english                              7.191299
logical                              4.236020
quant                                2.512329
domain                               0.004919
computerprogramming                  8.929076
electronicsandsemicon               -2.147063
computerscience                     10.254859
mechanicalengg                      -2.768478
electricalengg                      -1.111177
telecomengg                         -0.014920
civilengg                           -1.153006
conscientiousness                    0.410277
agreeableness                        0.561601
extraversion                         0.417303
nueroticism                         -0.066829
openess_to_experience                1.016214

[39 rows x 39 columns]
```

In [16]:
```
corr_matrix = df.select_dtypes(include=[np.number]).corr()
print(corr_matrix)
```

```
                            id    salary  10percentage  12graduation  \
id                    1.000000 -0.247294      0.044547      0.673102
salary               -0.247294  1.000000      0.177373     -0.161383
10percentage          0.044547  0.177373      1.000000      0.269957
12graduation          0.673102 -0.161383      0.269957      1.000000
12percentage          0.007069  0.170254      0.643378      0.259166
collegeid             0.284540 -0.118690      0.021082      0.254021
collegetier           0.035160 -0.179332     -0.126042      0.027691
collegegpa            0.047144  0.130103      0.312538      0.086001
collegecityid         0.284540 -0.118690      0.021082      0.254021
collegecitytier      -0.035977  0.015384      0.116707     -0.003016
graduationyear        0.027539 -0.010053     -0.013799      0.014457
```

```
english                 0.135505  0.178219      0.350780      0.147925
logical                 0.102215  0.179275      0.316014      0.105887
quant                  -0.055134  0.230627      0.317640      0.001379
domain                 -0.125639  0.104656      0.078563     -0.034163
computerprogramming     0.018859  0.115665      0.053600     -0.047995
electronicsandsemicon  -0.115601  0.000665      0.085179     -0.005891
computerscience         0.482626 -0.100720     -0.018933      0.293439
mechanicalengg         -0.026147  0.018475      0.050364      0.035459
electricalengg          0.104454 -0.047598      0.074419      0.123751
telecomengg            -0.049272 -0.022691      0.049378      0.023470
civilengg              -0.017871  0.037639      0.030002     -0.004727
conscientiousness       0.175557 -0.064148      0.067657      0.103329
agreeableness           0.024837  0.057423      0.136645      0.041182
extraversion            0.120979 -0.010213     -0.004679      0.061956
nueroticism            -0.146289 -0.054685     -0.132496     -0.074369
openess_to_experience   0.031359 -0.011312      0.036692     -0.015069

                       12percentage  collegeid  collegetier  collegegpa  \
id                         0.007069   0.284540     0.035160    0.047144
salary                     0.170254  -0.118690    -0.179332    0.130103
10percentage               0.643378   0.021082    -0.126042    0.312538
12graduation               0.259166   0.254021     0.027691    0.086001
12percentage               1.000000   0.022336    -0.100771    0.346137
collegeid                  0.022336   1.000000     0.067054    0.017240
collegetier               -0.100771   0.067054     1.000000   -0.086781
collegegpa                 0.346137   0.017240    -0.086781    1.000000
collegecityid              0.022336   1.000000     0.067054    0.017240
collegecitytier            0.130462   0.007757    -0.101494    0.017471
graduationyear            -0.012933  -0.000172    -0.005557    0.008706
english                    0.212888  -0.022792    -0.183843    0.106478
logical                    0.243571  -0.047094    -0.182811    0.196610
quant                      0.312413  -0.114672    -0.251103    0.217380
domain                     0.074099  -0.073857    -0.061436    0.107252
computerprogramming        0.080818  -0.033760    -0.073644    0.136596
electronicsandsemicon      0.117112  -0.020438    -0.031573    0.029855
computerscience           -0.043534   0.102303     0.001053    0.007601
mechanicalengg             0.037635  -0.009291    -0.021548   -0.031765
electricalengg             0.064001   0.022933     0.002594    0.052258
telecomengg                0.044201   0.025620     0.000007   -0.005226
civilengg                  0.005910   0.005749    -0.033722   -0.018950
conscientiousness          0.058299   0.076432     0.055174    0.069582
agreeableness              0.103998  -0.005264    -0.038055    0.068282
extraversion              -0.007486   0.005917     0.009970   -0.032684
nueroticism               -0.094369  -0.008973     0.023778   -0.074859
openess_to_experience      0.006332  -0.010678    -0.019179    0.028071

                       collegecityid  collegecitytier  ...  computerscience  \
id                          0.284540        -0.035977  ...         0.482626
salary                     -0.118690         0.015384  ...        -0.100720
10percentage                0.021082         0.116707  ...        -0.018933
12graduation                0.254021        -0.003016  ...         0.293439
12percentage                0.022336         0.130462  ...        -0.043534
collegeid                   1.000000         0.007757  ...         0.102303
collegetier                 0.067054        -0.101494  ...         0.001053
collegegpa                  0.017240         0.017471  ...         0.007601
collegecityid               1.000000         0.007757  ...         0.102303
collegecitytier             0.007757         1.000000  ...        -0.010643
graduationyear             -0.000172         0.008152  ...         0.024089
english                    -0.022792         0.050462  ...         0.059500
logical                    -0.047094         0.020353  ...         0.044481
quant                      -0.114672         0.007896  ...        -0.043379
domain                     -0.073857         0.009250  ...         0.058762
computerprogramming        -0.033760         0.064272  ...         0.253039
electronicsandsemicon      -0.020438         0.041083  ...        -0.273707
computerscience             0.102303        -0.010643  ...         1.000000
mechanicalengg             -0.009291        -0.052395  ...        -0.124355
electricalengg              0.022933         0.010311  ...        -0.083798
telecomengg                 0.025620         0.049876  ...        -0.148095
civilengg                   0.005749        -0.033392  ...        -0.052613
conscientiousness           0.076432         0.014763  ...         0.090155
agreeableness              -0.005264         0.005565  ...         0.039866
extraversion                0.005917        -0.008203  ...         0.102153
nueroticism                -0.008973         0.004442  ...        -0.112652
openess_to_experience      -0.010678        -0.016790  ...         0.058039

                       mechanicalengg  electricalengg  telecomengg  civilengg  \
id                          -0.026147        0.104454    -0.049272  -0.017871
salary                       0.018475       -0.047598    -0.022691   0.037639
10percentage                 0.050364        0.074419     0.049378   0.030002
12graduation                 0.035459        0.123751     0.023470  -0.004727
12percentage                 0.037635        0.064001     0.044201   0.005910
collegeid                   -0.009291        0.022933     0.025620   0.005749
collegetier                 -0.021548        0.002594     0.000007  -0.033722
collegegpa                  -0.031765        0.052258    -0.005226  -0.018950
collegecityid               -0.009291        0.022933     0.025620   0.005749
collegecitytier             -0.052395        0.010311     0.049876  -0.033392
graduationyear              -0.066844        0.008525     0.004226   0.001696
english                     -0.002477        0.032438    -0.005822  -0.007724
logical                     -0.009861        0.012003    -0.012947  -0.011286
```

```
quant                        0.019933        0.020975     0.021387   0.000528
domain                       0.048472        0.042875     0.024442   0.017569
computerprogramming         -0.284891       -0.138224    -0.248269  -0.088249
electronicsandsemicon       -0.109434        0.036968     0.387140   0.002863
computerscience             -0.124355       -0.083798    -0.148095  -0.052613
mechanicalengg               1.000000       -0.040522    -0.070947   0.076201
electricalengg              -0.040522        1.000000    -0.051469  -0.020059
telecomengg                 -0.070947       -0.051469     1.000000  -0.031492
civilengg                    0.076201       -0.020059    -0.031492   1.000000
conscientiousness           -0.010858        0.029806    -0.004946  -0.017526
agreeableness               -0.028586       -0.015454    -0.014627  -0.034254
extraversion                -0.017748        0.004467    -0.039050  -0.031822
nueroticism                  0.036148       -0.030870     0.020638   0.010555
openess_to_experience       -0.027988       -0.012585    -0.000141  -0.031201

                        conscientiousness  agreeableness  extraversion  \
id                               0.175557       0.024837      0.120979
salary                          -0.064148       0.057423     -0.010213
10percentage                     0.067657       0.136645     -0.004679
12graduation                     0.103329       0.041182      0.061956
12percentage                     0.058299       0.103998     -0.007486
collegeid                        0.076432      -0.005264      0.005917
collegetier                      0.055174      -0.038055      0.009970
collegegpa                       0.069582       0.068282     -0.032684
collegecityid                    0.076432      -0.005264      0.005917
collegecitytier                  0.014763       0.005565     -0.008203
graduationyear                  -0.013235      -0.002877      0.008397
english                          0.034943       0.194990      0.018755
logical                          0.025876       0.167207     -0.006949
quant                           -0.005639       0.103443     -0.028616
domain                          -0.039478       0.051944     -0.024647
computerprogramming              0.012862       0.076934      0.043504
electronicsandsemicon           -0.026483      -0.024286     -0.044458
computerscience                  0.090155       0.039866      0.102153
mechanicalengg                  -0.010858      -0.028586     -0.017748
electricalengg                   0.029806      -0.015454      0.004467
telecomengg                     -0.004946      -0.014627     -0.039050
civilengg                       -0.017526      -0.034254     -0.031822
conscientiousness                1.000000       0.481820      0.355537
agreeableness                    0.481820       1.000000      0.454369
extraversion                     0.355537       0.454369      1.000000
nueroticism                     -0.330312      -0.207480     -0.096491
openess_to_experience            0.395649       0.591541      0.435074

                        nueroticism  openess_to_experience
id                        -0.146289               0.031359
salary                    -0.054685              -0.011312
10percentage              -0.132496               0.036692
12graduation              -0.074369              -0.015069
12percentage              -0.094369               0.006332
collegeid                 -0.008973              -0.010678
collegetier                0.023778              -0.019179
collegegpa                -0.074859               0.028071
collegecityid             -0.008973              -0.010678
collegecitytier            0.004442              -0.016790
graduationyear            -0.000417               0.016855
english                   -0.155528               0.067979
logical                   -0.178781               0.048420
quant                     -0.131895               0.020377
domain                    -0.017928               0.010412
computerprogramming       -0.084344               0.043133
electronicsandsemicon      0.021026              -0.013460
computerscience           -0.112652               0.058039
mechanicalengg             0.036148              -0.027988
electricalengg            -0.030870              -0.012585
telecomengg                0.020638              -0.000141
civilengg                  0.010555              -0.031201
conscientiousness         -0.330312               0.395649
agreeableness             -0.207480               0.591541
extraversion              -0.096491               0.435074
nueroticism                1.000000              -0.065795
openess_to_experience     -0.065795               1.000000

[27 rows x 27 columns]
```

In [17]:

```
#Coorelation
df_numeric = df.apply(pd.to_numeric, errors='coerce')
corr_matrix = df_numeric.corr()
print(corr_matrix)
```

```
                        column1        id    salary  doj  dol  designation  \
column1                     NaN       NaN       NaN  NaN  NaN          NaN
id                          NaN  1.000000 -0.247294  NaN  NaN          NaN
salary                      NaN -0.247294  1.000000  NaN  NaN          NaN
doj                         NaN       NaN       NaN  NaN  NaN          NaN
dol                         NaN       NaN       NaN  NaN  NaN          NaN
designation                 NaN       NaN       NaN  NaN  NaN          NaN
jobcity                     NaN       NaN       NaN  NaN  NaN          NaN
gender                      NaN       NaN       NaN  NaN  NaN          NaN
```

dob	NaN	NaN	NaN	NaN	NaN	NaN
10percentage	NaN	0.044547	0.177373	NaN	NaN	NaN
10board	NaN	NaN	NaN	NaN	NaN	NaN
12graduation	NaN	0.673102	-0.161383	NaN	NaN	NaN
12percentage	NaN	0.007069	0.170254	NaN	NaN	NaN
12board	NaN	NaN	NaN	NaN	NaN	NaN
collegeid	NaN	0.284540	-0.118690	NaN	NaN	NaN
collegetier	NaN	0.035160	-0.179332	NaN	NaN	NaN
degree	NaN	NaN	NaN	NaN	NaN	NaN
specialization	NaN	NaN	NaN	NaN	NaN	NaN
collegegpa	NaN	0.047144	0.130103	NaN	NaN	NaN
collegecityid	NaN	0.284540	-0.118690	NaN	NaN	NaN
collegecitytier	NaN	-0.035977	0.015384	NaN	NaN	NaN
collegestate	NaN	NaN	NaN	NaN	NaN	NaN
graduationyear	NaN	0.027539	-0.010053	NaN	NaN	NaN
english	NaN	0.135505	0.178219	NaN	NaN	NaN
logical	NaN	0.102215	0.179275	NaN	NaN	NaN
quant	NaN	-0.055134	0.230627	NaN	NaN	NaN
domain	NaN	-0.125639	0.104656	NaN	NaN	NaN
computerprogramming	NaN	0.018859	0.115665	NaN	NaN	NaN
electronicsandsemicon	NaN	-0.115601	0.000665	NaN	NaN	NaN
computerscience	NaN	0.482626	-0.100720	NaN	NaN	NaN
mechanicalengg	NaN	-0.026147	0.018475	NaN	NaN	NaN
electricalengg	NaN	0.104454	-0.047598	NaN	NaN	NaN
telecomengg	NaN	-0.049272	-0.022691	NaN	NaN	NaN
civilengg	NaN	-0.017871	0.037639	NaN	NaN	NaN
conscientiousness	NaN	0.175557	-0.064148	NaN	NaN	NaN
agreeableness	NaN	0.024837	0.057423	NaN	NaN	NaN
extraversion	NaN	0.120979	-0.010213	NaN	NaN	NaN
nueroticism	NaN	-0.146289	-0.054685	NaN	NaN	NaN
openess_to_experience	NaN	0.031359	-0.011312	NaN	NaN	NaN

	jobcity	gender	dob	10percentage	...	\
column1	NaN	NaN	NaN	NaN	...	
id	NaN	NaN	NaN	0.044547	...	
salary	NaN	NaN	NaN	0.177373	...	
doj	NaN	NaN	NaN	NaN	...	
dol	NaN	NaN	NaN	NaN	...	
designation	NaN	NaN	NaN	NaN	...	
jobcity	NaN	NaN	NaN	NaN	...	
gender	NaN	NaN	NaN	NaN	...	
dob	NaN	NaN	NaN	NaN	...	
10percentage	NaN	NaN	NaN	1.000000	...	
10board	NaN	NaN	NaN	NaN	...	
12graduation	NaN	NaN	NaN	0.269957	...	
12percentage	NaN	NaN	NaN	0.643378	...	
12board	NaN	NaN	NaN	NaN	...	
collegeid	NaN	NaN	NaN	0.021082	...	
collegetier	NaN	NaN	NaN	-0.126042	...	
degree	NaN	NaN	NaN	NaN	...	
specialization	NaN	NaN	NaN	NaN	...	
collegegpa	NaN	NaN	NaN	0.312538	...	
collegecityid	NaN	NaN	NaN	0.021082	...	
collegecitytier	NaN	NaN	NaN	0.116707	...	
collegestate	NaN	NaN	NaN	NaN	...	
graduationyear	NaN	NaN	NaN	-0.013799	...	
english	NaN	NaN	NaN	0.350780	...	
logical	NaN	NaN	NaN	0.316014	...	
quant	NaN	NaN	NaN	0.317640	...	
domain	NaN	NaN	NaN	0.078563	...	
computerprogramming	NaN	NaN	NaN	0.053600	...	
electronicsandsemicon	NaN	NaN	NaN	0.085179	...	
computerscience	NaN	NaN	NaN	-0.018933	...	
mechanicalengg	NaN	NaN	NaN	0.050364	...	
electricalengg	NaN	NaN	NaN	0.074419	...	
telecomengg	NaN	NaN	NaN	0.049378	...	
civilengg	NaN	NaN	NaN	0.030002	...	
conscientiousness	NaN	NaN	NaN	0.067657	...	
agreeableness	NaN	NaN	NaN	0.136645	...	
extraversion	NaN	NaN	NaN	-0.004679	...	
nueroticism	NaN	NaN	NaN	-0.132496	...	
openess_to_experience	NaN	NaN	NaN	0.036692	...	

	computerscience	mechanicalengg	electricalengg	\
column1	NaN	NaN	NaN	
id	0.482626	-0.026147	0.104454	
salary	-0.100720	0.018475	-0.047598	
doj	NaN	NaN	NaN	
dol	NaN	NaN	NaN	
designation	NaN	NaN	NaN	
jobcity	NaN	NaN	NaN	
gender	NaN	NaN	NaN	
dob	NaN	NaN	NaN	
10percentage	-0.018933	0.050364	0.074419	
10board	NaN	NaN	NaN	
12graduation	0.293439	0.035459	0.123751	
12percentage	-0.043534	0.037635	0.064001	
12board	NaN	NaN	NaN	
collegeid	0.102303	-0.009291	0.022933	

collegetier	0.001053	-0.021548	0.002594
degree	NaN	NaN	NaN
specialization	NaN	NaN	NaN
collegegpa	0.007601	-0.031765	0.052258
collegecityid	0.102303	-0.009291	0.022933
collegecitytier	-0.010643	-0.052395	0.010311
collegestate	NaN	NaN	NaN
graduationyear	0.024089	-0.066844	0.008525
english	0.059500	-0.002477	0.032438
logical	0.044481	-0.009861	0.012003
quant	-0.043379	0.019933	0.020975
domain	0.058762	0.048472	0.042875
computerprogramming	0.253039	-0.284891	-0.138224
electronicsandsemicon	-0.273707	-0.109434	0.036968
computerscience	1.000000	-0.124355	-0.083798
mechanicalengg	-0.124355	1.000000	-0.040522
electricalengg	-0.083798	-0.040522	1.000000
telecomengg	-0.148095	-0.070947	-0.051469
civilengg	-0.052613	0.076201	-0.020059
conscientiousness	0.090155	-0.010858	0.029806
agreeableness	0.039866	-0.028586	-0.015454
extraversion	0.102153	-0.017748	0.004467
nueroticism	-0.112652	0.036148	-0.030870
openess_to_experience	0.058039	-0.027988	-0.012585

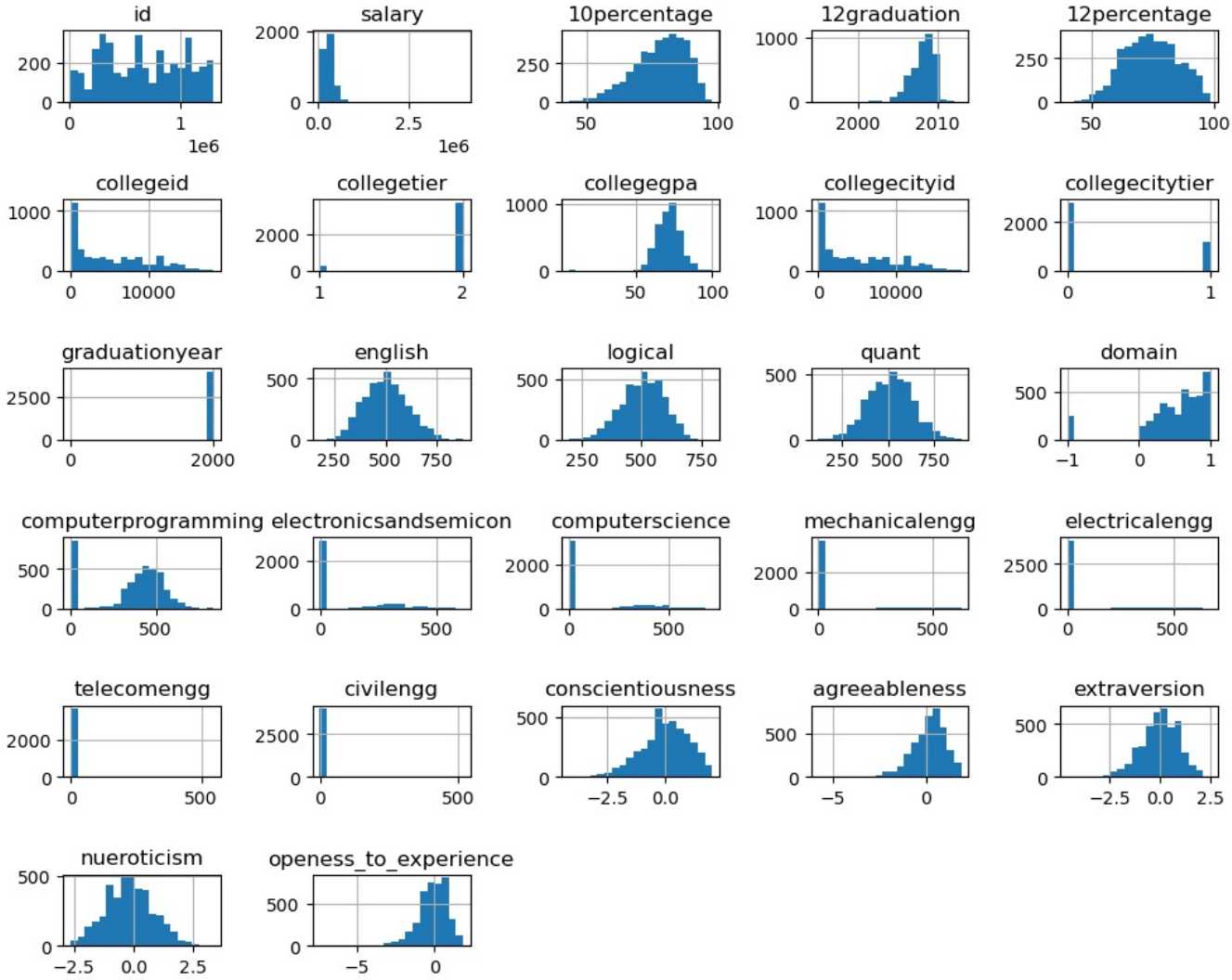
	telecomengg	civilengg	conscientiousness	\
column1	NaN	NaN	NaN	
id	-0.049272	-0.017871	0.175557	
salary	-0.022691	0.037639	-0.064148	
doj	NaN	NaN	NaN	
dol	NaN	NaN	NaN	
designation	NaN	NaN	NaN	
jobcity	NaN	NaN	NaN	
gender	NaN	NaN	NaN	
dob	NaN	NaN	NaN	
10percentage	0.049378	0.030002	0.067657	
10board	NaN	NaN	NaN	
12graduation	0.023470	-0.004727	0.103329	
12percentage	0.044201	0.005910	0.058299	
12board	NaN	NaN	NaN	
collegeid	0.025620	0.005749	0.076432	
collegetier	0.000007	-0.033722	0.055174	
degree	NaN	NaN	NaN	
specialization	NaN	NaN	NaN	
collegegpa	-0.005226	-0.018950	0.069582	
collegecityid	0.025620	0.005749	0.076432	
collegecitytier	0.049876	-0.033392	0.014763	
collegestate	NaN	NaN	NaN	
graduationyear	0.004226	0.001696	-0.013235	
english	-0.005822	-0.007724	0.034943	
logical	-0.012947	-0.011286	0.025876	
quant	0.021387	0.000528	-0.005639	
domain	0.024442	0.017569	-0.039478	
computerprogramming	-0.248269	-0.088249	0.012862	
electronicsandsemicon	0.387140	0.002863	-0.026483	
computerscience	-0.148095	-0.052613	0.090155	
mechanicalengg	-0.070947	0.076201	-0.010858	
electricalengg	-0.051469	-0.020059	0.029806	
telecomengg	1.000000	-0.031492	-0.004946	
civilengg	-0.031492	1.000000	-0.017526	
conscientiousness	-0.004946	-0.017526	1.000000	
agreeableness	-0.014627	-0.034254	0.481820	
extraversion	-0.039050	-0.031822	0.355537	
nueroticism	0.020638	0.010555	-0.330312	
openess_to_experience	-0.000141	-0.031201	0.395649	

	agreeableness	extraversion	nueroticism	\
column1	NaN	NaN	NaN	
id	0.024837	0.120979	-0.146289	
salary	0.057423	-0.010213	-0.054685	
doj	NaN	NaN	NaN	
dol	NaN	NaN	NaN	
designation	NaN	NaN	NaN	
jobcity	NaN	NaN	NaN	
gender	NaN	NaN	NaN	
dob	NaN	NaN	NaN	
10percentage	0.136645	-0.004679	-0.132496	
10board	NaN	NaN	NaN	
12graduation	0.041182	0.061956	-0.074369	
12percentage	0.103998	-0.007486	-0.094369	
12board	NaN	NaN	NaN	
collegeid	-0.005264	0.005917	-0.008973	
collegetier	-0.038055	0.009970	0.023778	
degree	NaN	NaN	NaN	
specialization	NaN	NaN	NaN	
collegegpa	0.068282	-0.032684	-0.074859	
collegecityid	-0.005264	0.005917	-0.008973	
collegecitytier	0.005565	-0.008203	0.004442	
collegestate	NaN	NaN	NaN	

```
graduationyear             -0.002877      0.008397    -0.000417
english                     0.194990      0.018755    -0.155528
logical                     0.167207     -0.006949    -0.178781
quant                       0.103443     -0.028616    -0.131895
domain                      0.051944     -0.024647    -0.017928
computerprogramming         0.076934      0.043504    -0.084344
electronicsandsemicon      -0.024286     -0.044458     0.021026
computerscience             0.039866      0.102153    -0.112652
mechanicalengg             -0.028586     -0.017748     0.036148
electricalengg             -0.015454      0.004467    -0.030870
telecomengg                -0.014627     -0.039050     0.020638
civilengg                  -0.034254     -0.031822     0.010555
conscientiousness           0.481820      0.355537    -0.330312
agreeableness               1.000000      0.454369    -0.207480
extraversion                0.454369      1.000000    -0.096491
nueroticism                -0.207480     -0.096491     1.000000
openess_to_experience       0.591541      0.435074    -0.065795

                        openess_to_experience
column1                                   NaN
id                                   0.031359
salary                              -0.011312
doj                                       NaN
dol                                       NaN
designation                               NaN
jobcity                                   NaN
gender                                    NaN
dob                                       NaN
10percentage                         0.036692
10board                                   NaN
12graduation                        -0.015069
12percentage                         0.006332
12board                                   NaN
collegeid                           -0.010678
collegetier                         -0.019179
degree                                    NaN
specialization                            NaN
collegegpa                           0.028071
collegecityid                       -0.010678
collegecitytier                     -0.016790
collegestate                              NaN
graduationyear                       0.016855
english                              0.067979
logical                              0.048420
quant                                0.020377
domain                               0.010412
computerprogramming                  0.043133
electronicsandsemicon               -0.013460
computerscience                      0.058039
mechanicalengg                      -0.027988
electricalengg                      -0.012585
telecomengg                         -0.000141
civilengg                           -0.031201
conscientiousness                    0.395649
agreeableness                        0.591541
extraversion                         0.435074
nueroticism                         -0.065795
openess_to_experience                1.000000

[39 rows x 39 columns]
```

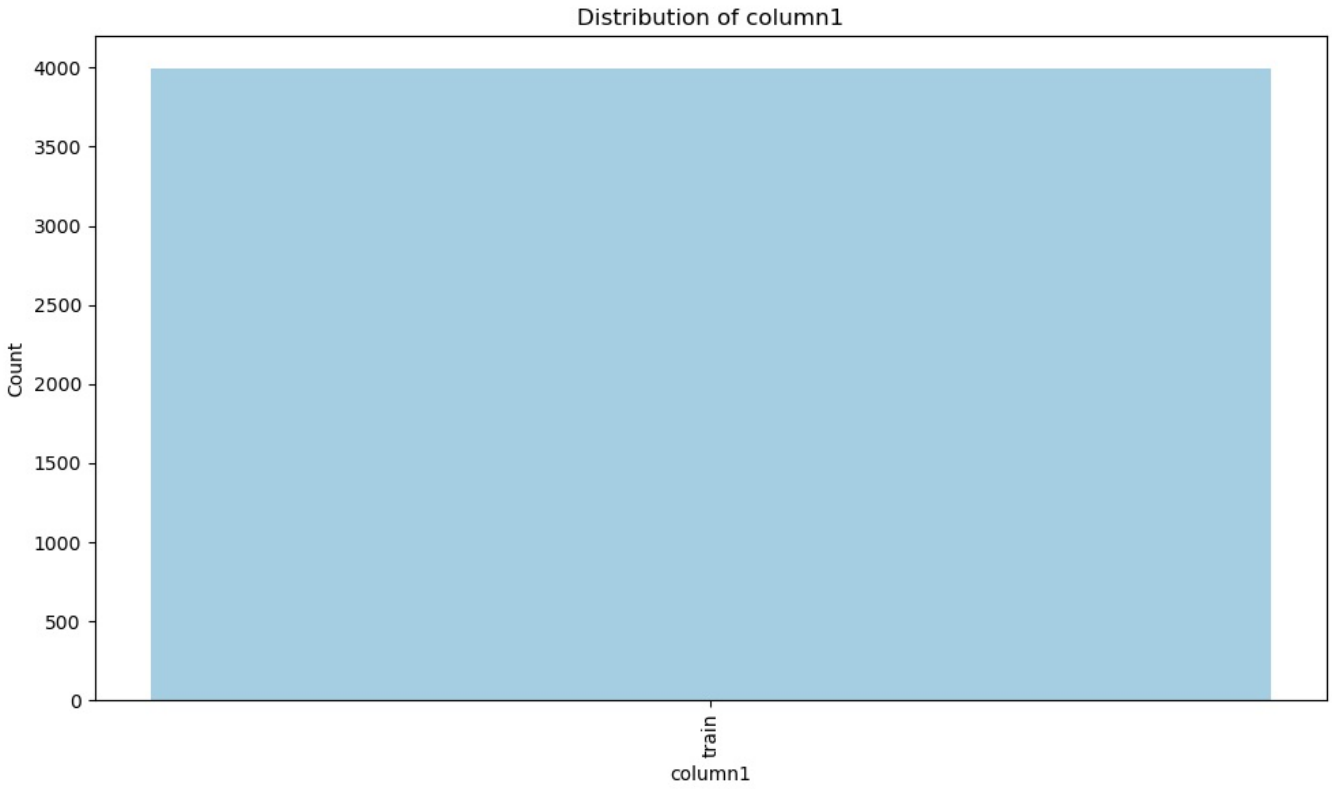
In [18]:

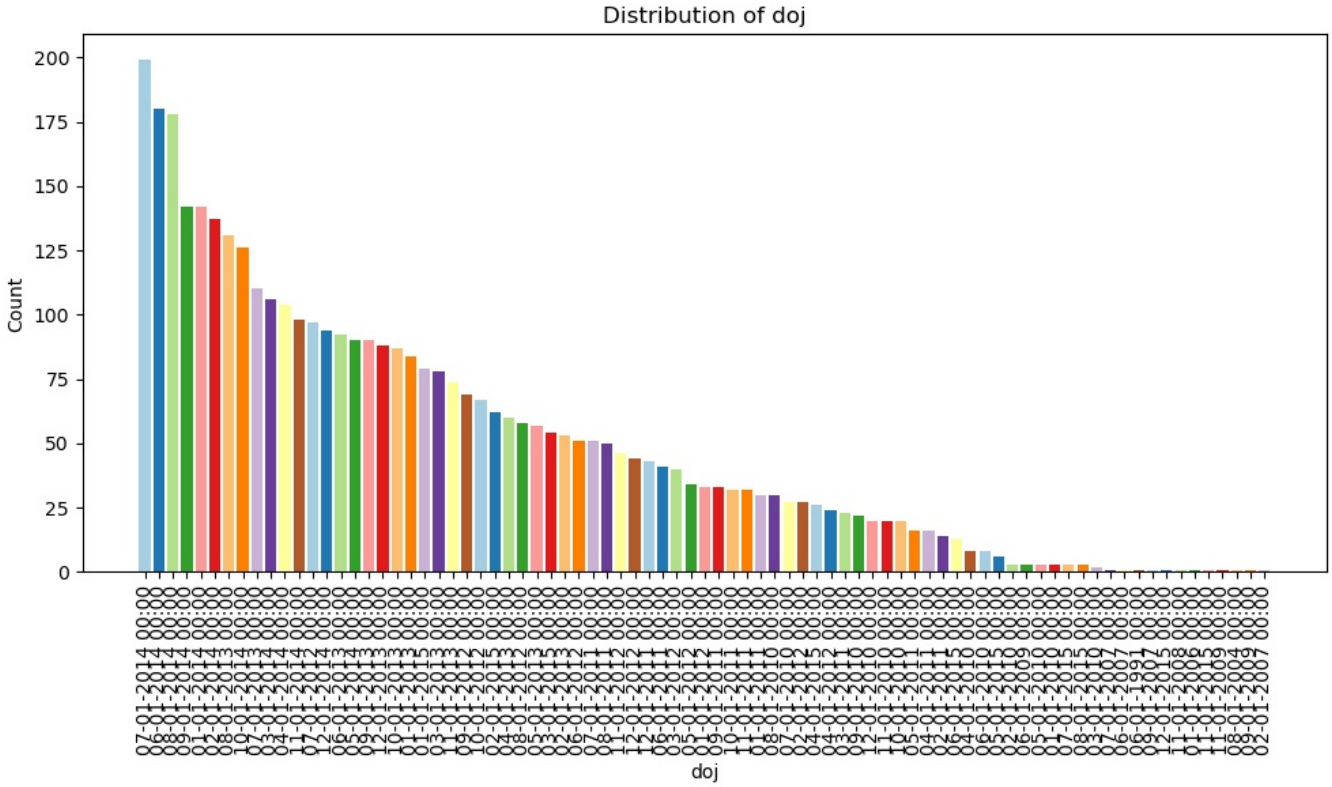
```python
#Histogram plot of numerical columns
import pandas as pd
import matplotlib.pyplot as plt

# Assuming df is your DataFrame
df_numeric = df.select_dtypes(include=[np.number])

# Generate histograms for all numeric columns
df_numeric.hist(figsize=(10, 8), bins=20)

# Display the plots
plt.tight_layout()
plt.show()
```

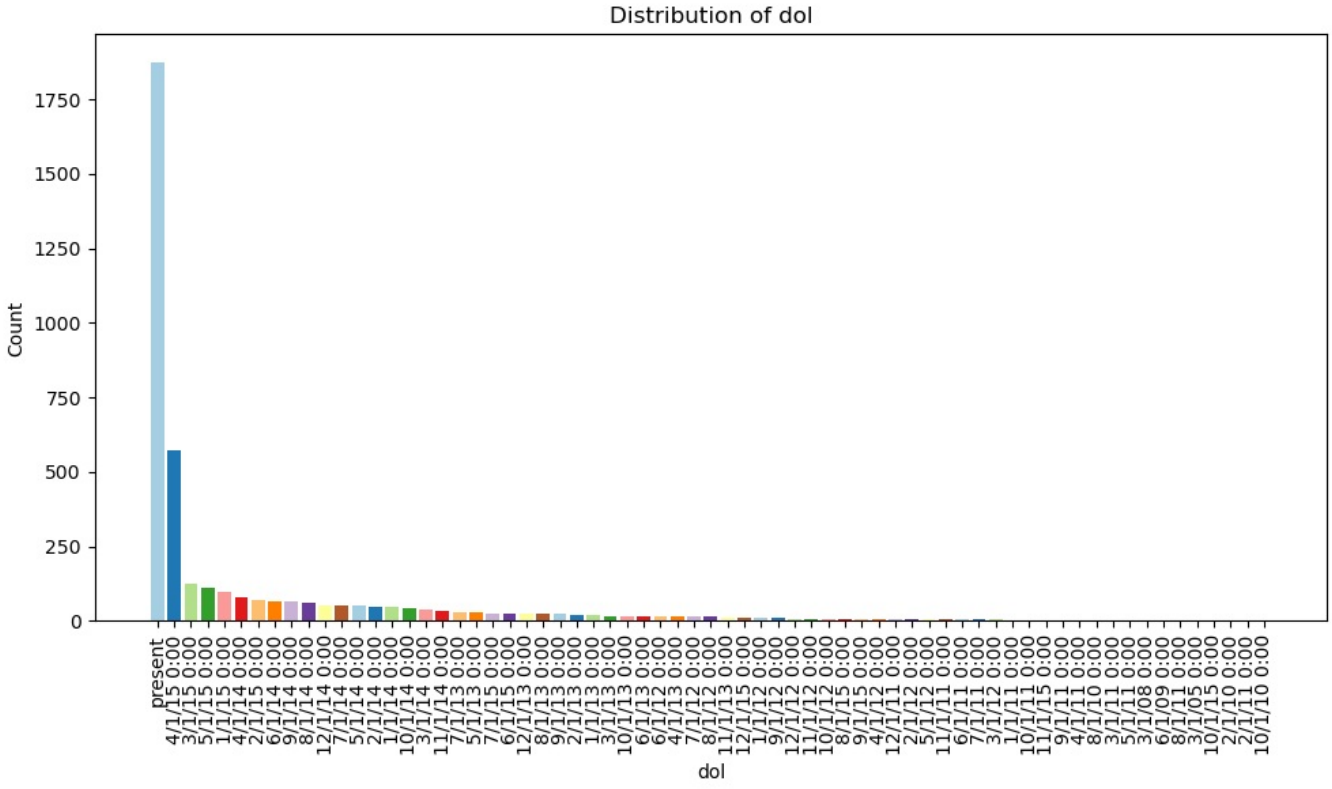


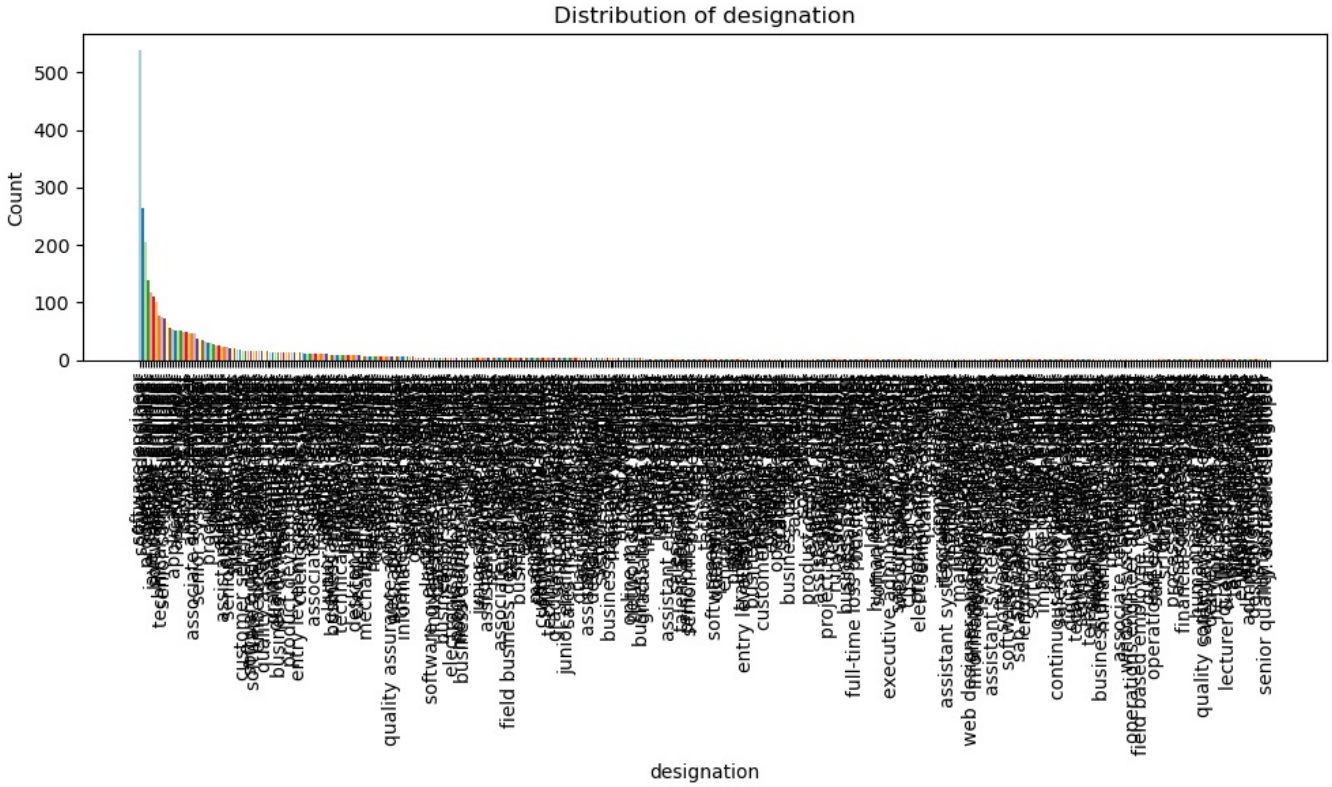
In [19]:

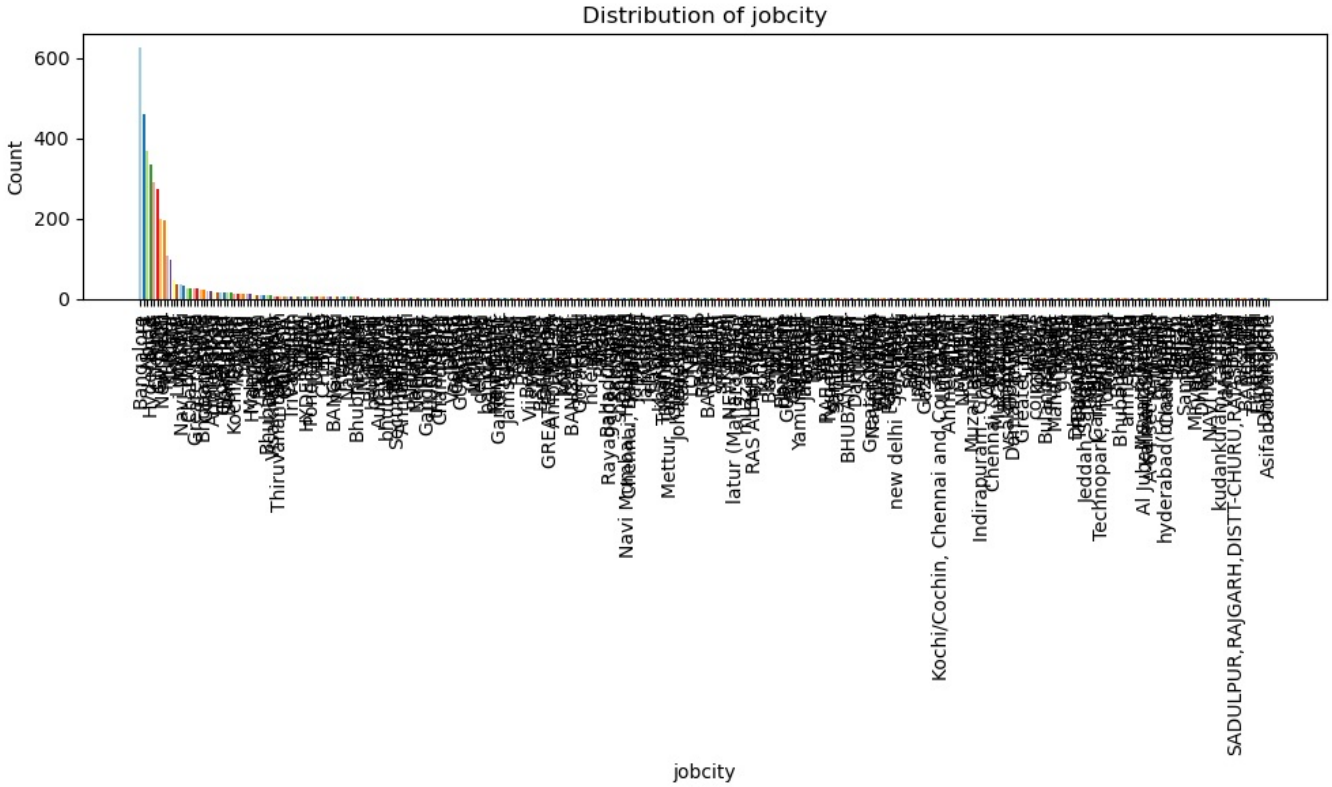
```python
import pandas as pd
import matplotlib.pyplot as plt

# List of your categorical columns
categorical_columns = ['column1', 'doj', 'dol', 'designation', 'jobcity', 'gender', 'dob',
       '10board', '12board', 'degree', 'specialization', 'collegestate']

# Loop through each categorical column and plot a bar chart
for column in categorical_columns:
    plt.figure(figsize=(10, 6))  # Adjust figure size as needed
    category_counts = df[column].value_counts()

    # Plot the bar chart
    plt.bar(category_counts.index, category_counts.values, color=plt.cm.Paired.colors)
    plt.title(f'Distribution of {column}')
    plt.xlabel(column)
    plt.ylabel('Count')
    plt.xticks(rotation=90)  # Rotate the x-axis labels for better readability

    # Show the plot
    plt.tight_layout()
    plt.show()
```

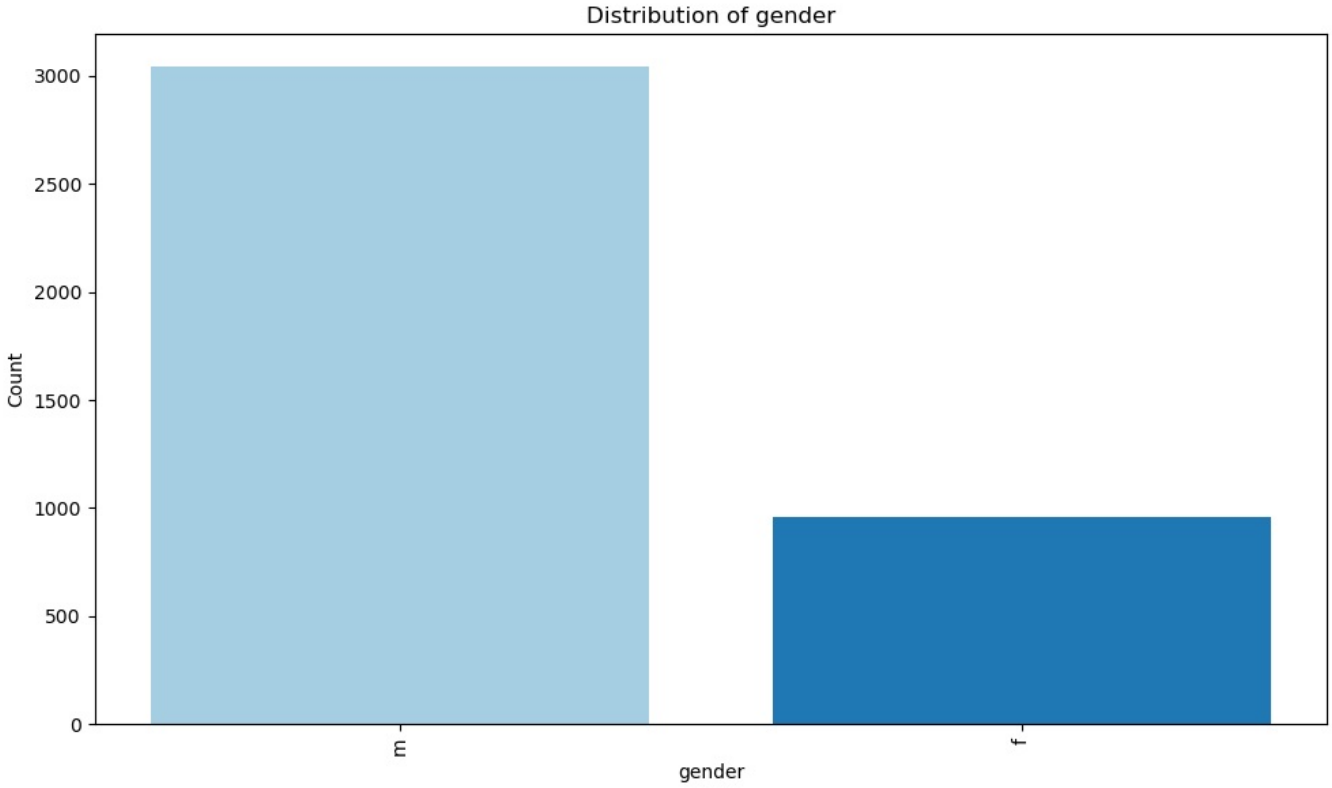

Distribution of column1
Count
4000
3500
3000
2500
2000
1500
1000
500
0
train
column1

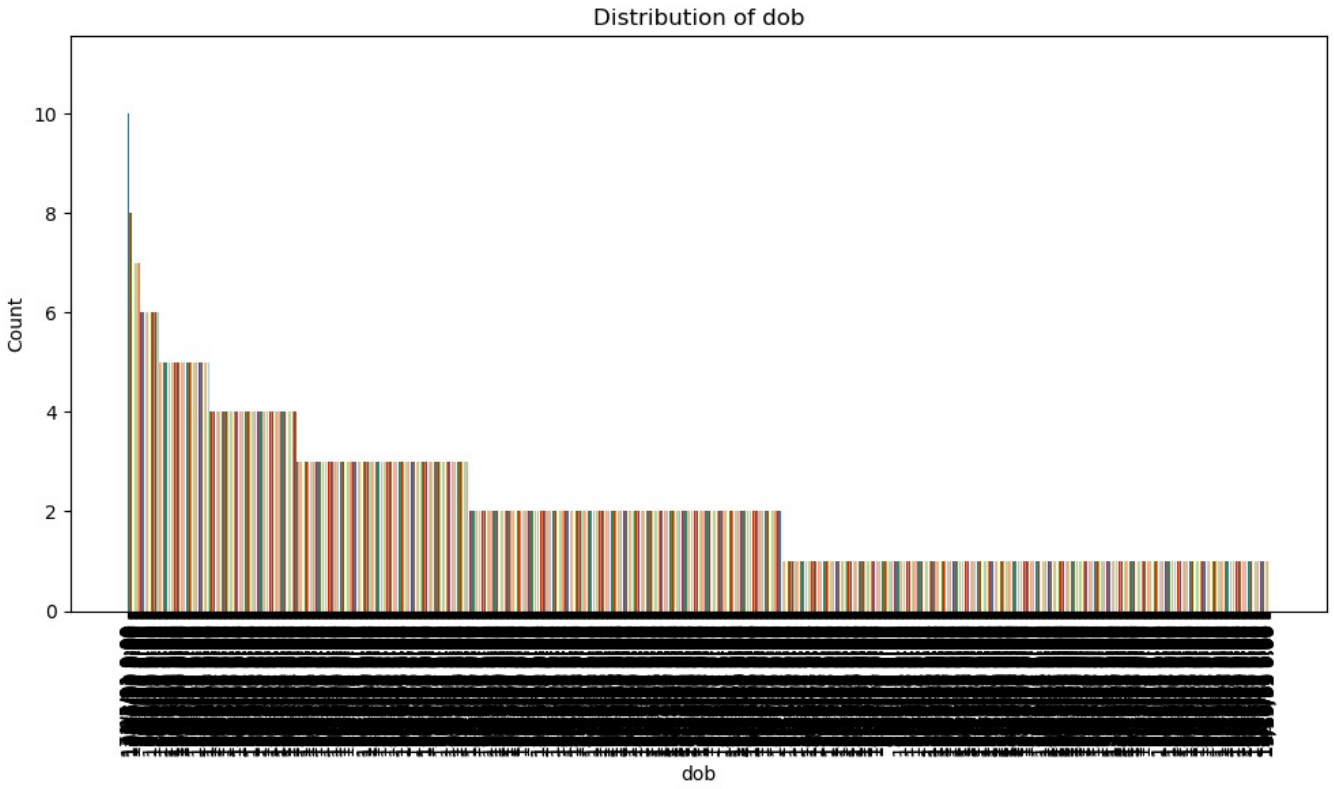

Distribution of doj
Count
200
175
150
125
100
75
50
25
0
doj


Distribution of dol
Count
dol
present
4/1/15 0:00
3/1/15 0:00
5/1/15 0:00
1/1/15 0:00
4/1/14 0:00
2/1/15 0:00
6/1/14 0:00
9/1/14 0:00
8/1/14 0:00
12/1/14 0:00
7/1/14 0:00
5/1/14 0:00
2/1/14 0:00
1/1/14 0:00
10/1/14 0:00
3/1/14 0:00
11/1/14 0:00
7/1/13 0:00
5/1/13 0:00
7/1/15 0:00
6/1/15 0:00
12/1/13 0:00
8/1/13 0:00
9/1/13 0:00
2/1/13 0:00
1/1/13 0:00
3/1/13 0:00
10/1/13 0:00
6/1/13 0:00
6/1/12 0:00
4/1/13 0:00
7/1/12 0:00
8/1/12 0:00
11/1/13 0:00
12/1/15 0:00
1/1/12 0:00
9/1/12 0:00
12/1/12 0:00
11/1/12 0:00
10/1/12 0:00
8/1/15 0:00
9/1/15 0:00
4/1/12 0:00
12/1/11 0:00
2/1/12 0:00
5/1/12 0:00
11/1/11 0:00
6/1/11 0:00
7/1/11 0:00
3/1/12 0:00
1/1/11 0:00
10/1/11 0:00
11/1/15 0:00
9/1/11 0:00
4/1/11 0:00
8/1/10 0:00
3/1/11 0:00
5/1/11 0:00
3/1/08 0:00
6/1/09 0:00
8/1/11 0:00
3/1/05 0:00
10/1/15 0:00
2/1/10 0:00
2/1/11 0:00
10/1/10 0:00

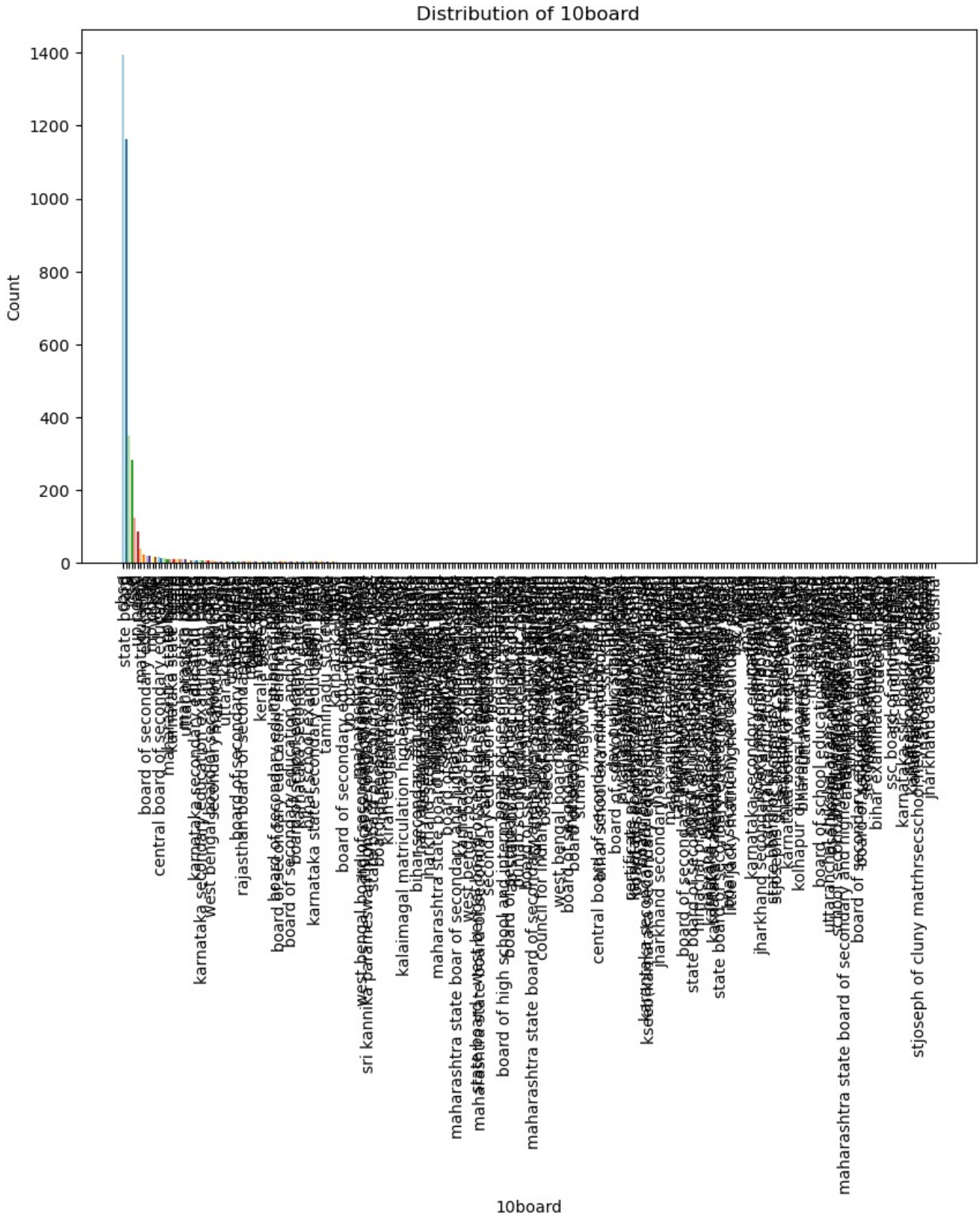

Distribution of designation
Count
designation


Distribution of jobcity
Count
0
200
400
600
jobcity

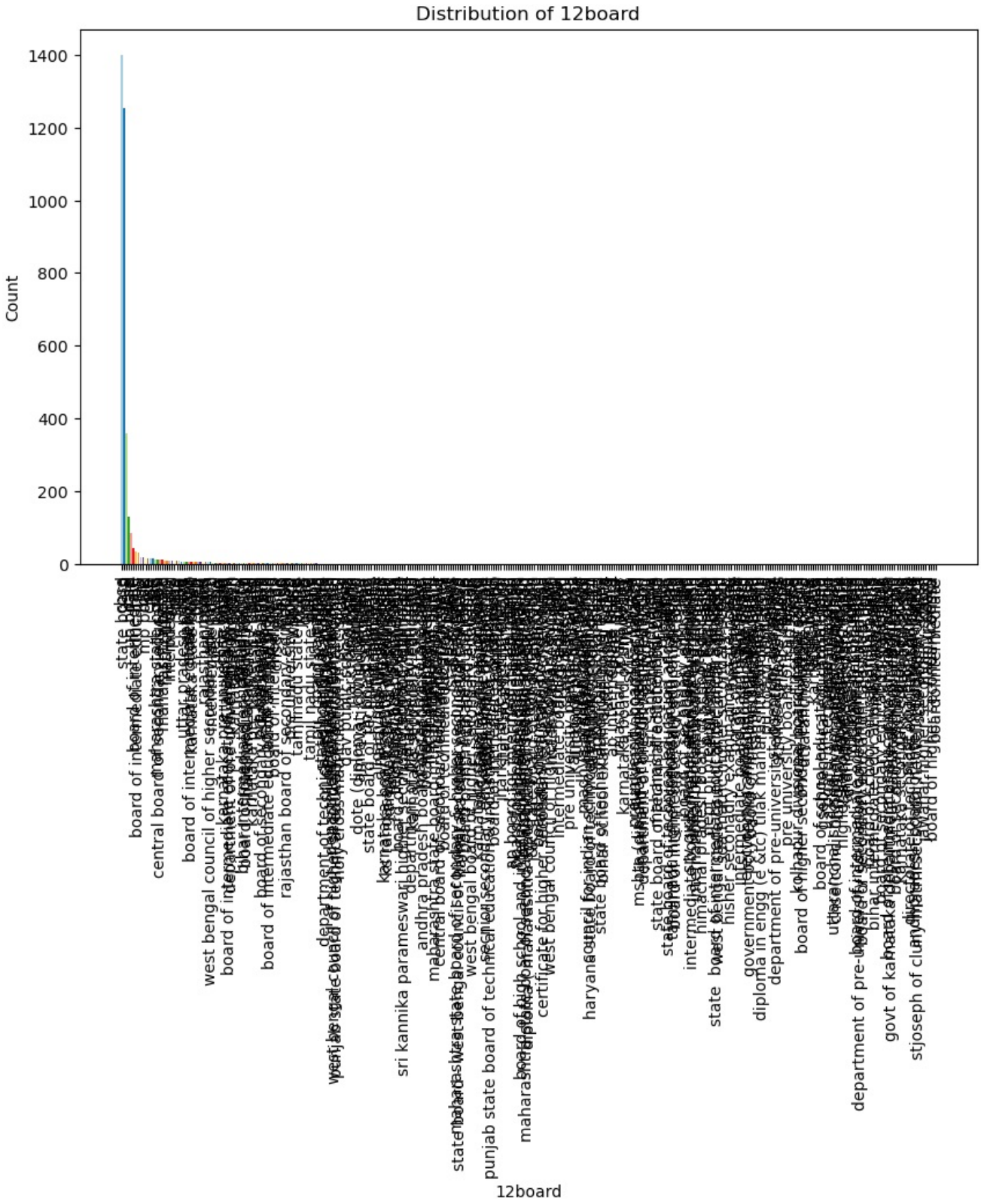

Distribution of gender
Count
0
500
1000
1500
2000
2500
3000
m
f
gender

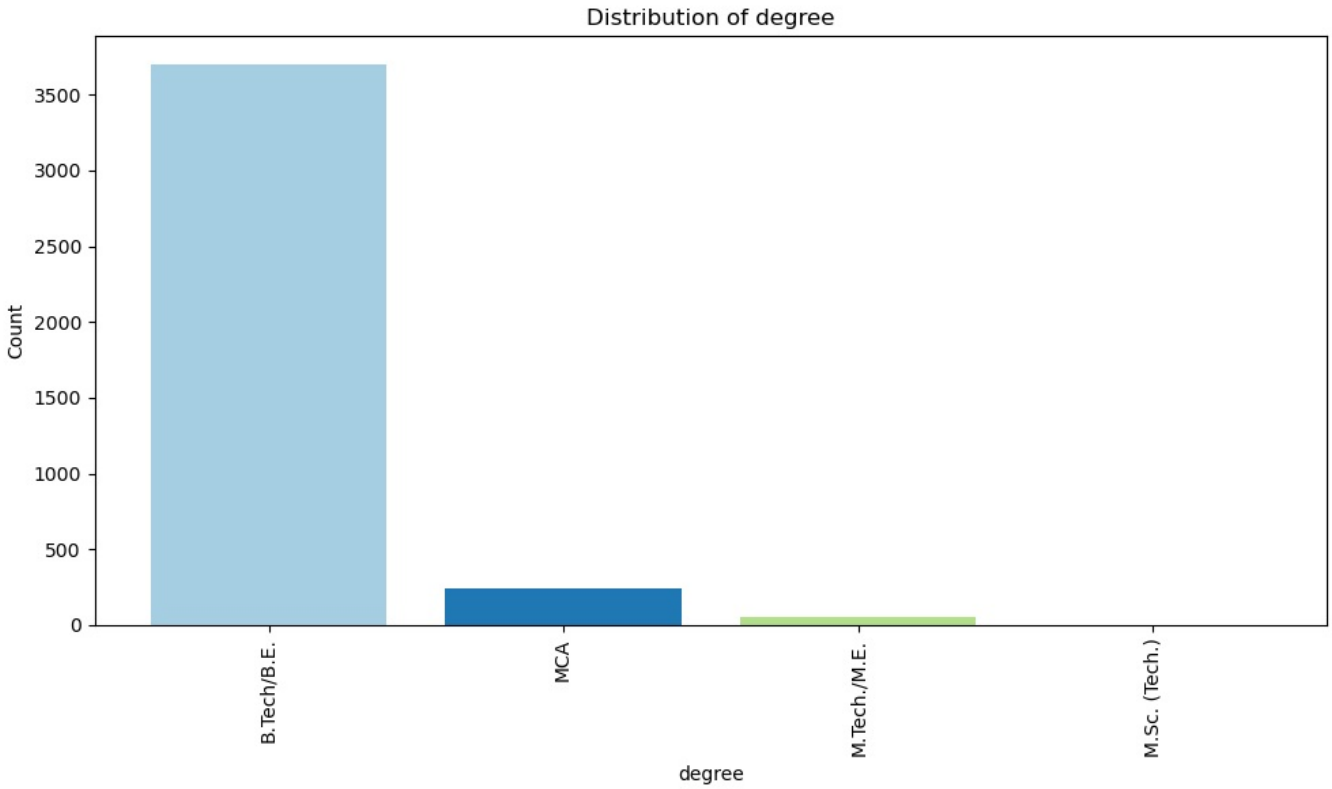


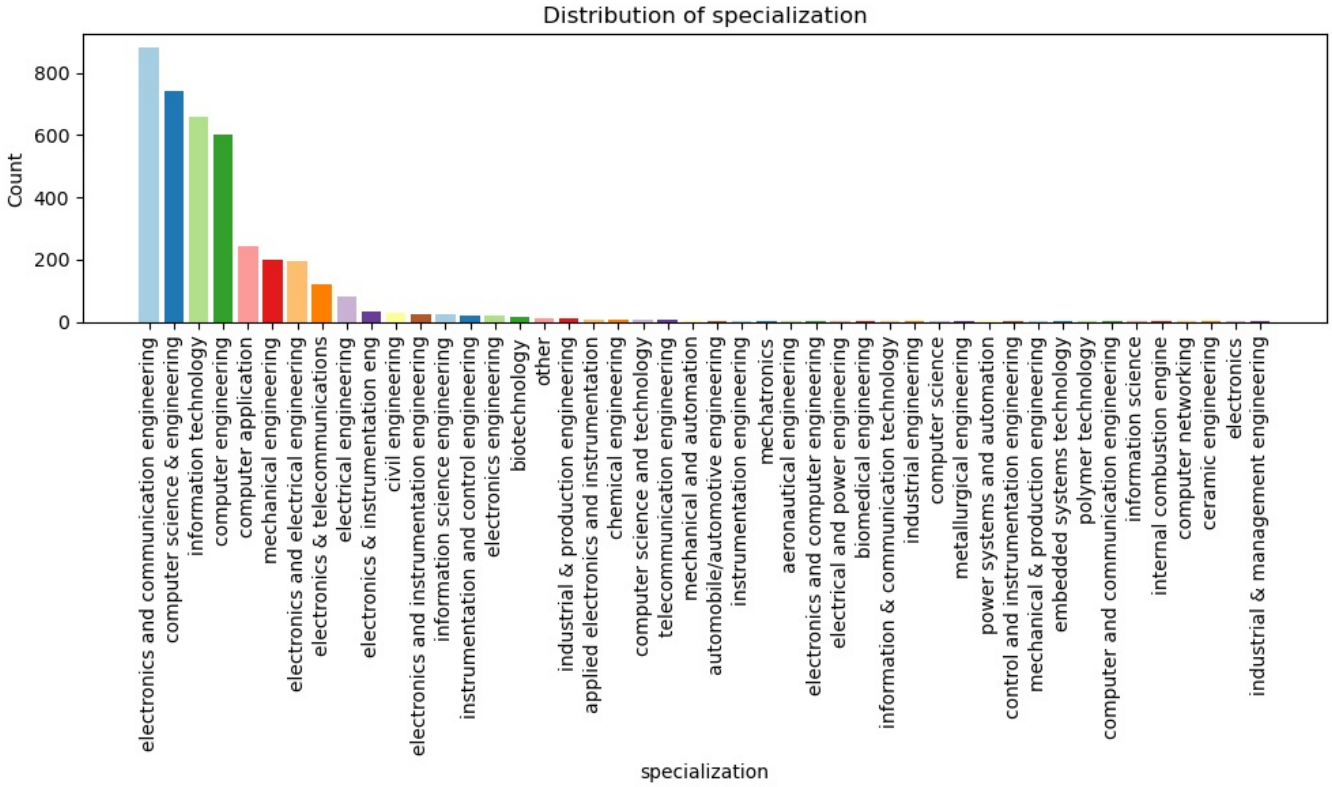

```
C:\Users\shanm\AppData\Local\Temp\ipykernel_26380\2272193603.py:21: UserWarning: Tight layout not applied. The bottom and top margins cannot be made large enough to accommodate all axes decorations.
  plt.tight_layout()
```

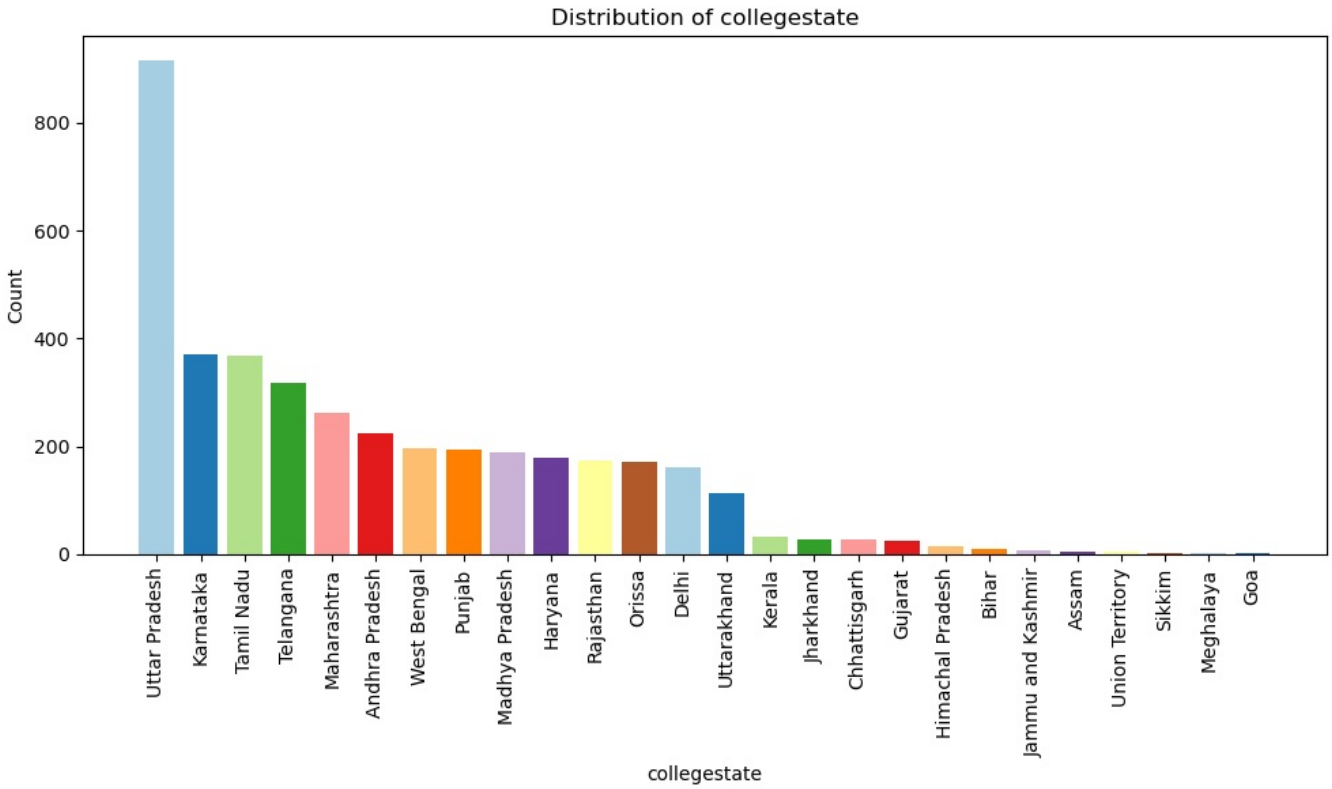



```
C:\Users\shanm\AppData\Local\Temp\ipykernel_26380\2272193603.py:21: UserWarning: Tight layout not applied. The
bottom and top margins cannot be made large enough to accommodate all axes decorations.
  plt.tight_layout()
```


Distribution of 12board
Count
0
200
400
600
800
1000
1200
1400
12board

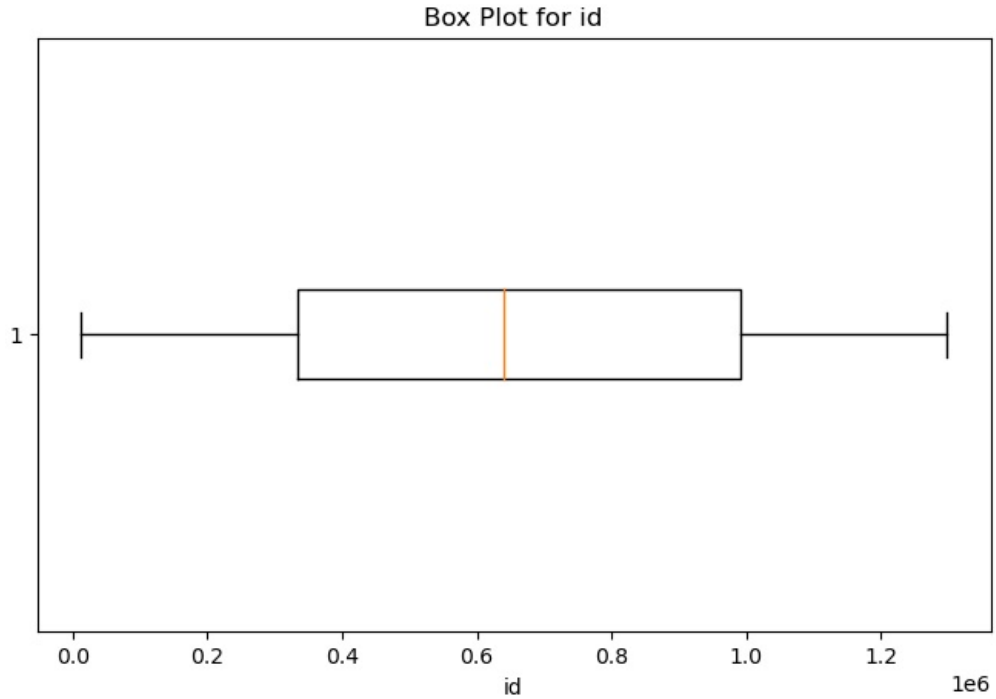

Distribution of degree
Count
0
500
1000
1500
2000
2500
3000
3500
B.Tech/B.E.
MCA
M.Tech./M.E.
M.Sc. (Tech.)
degree

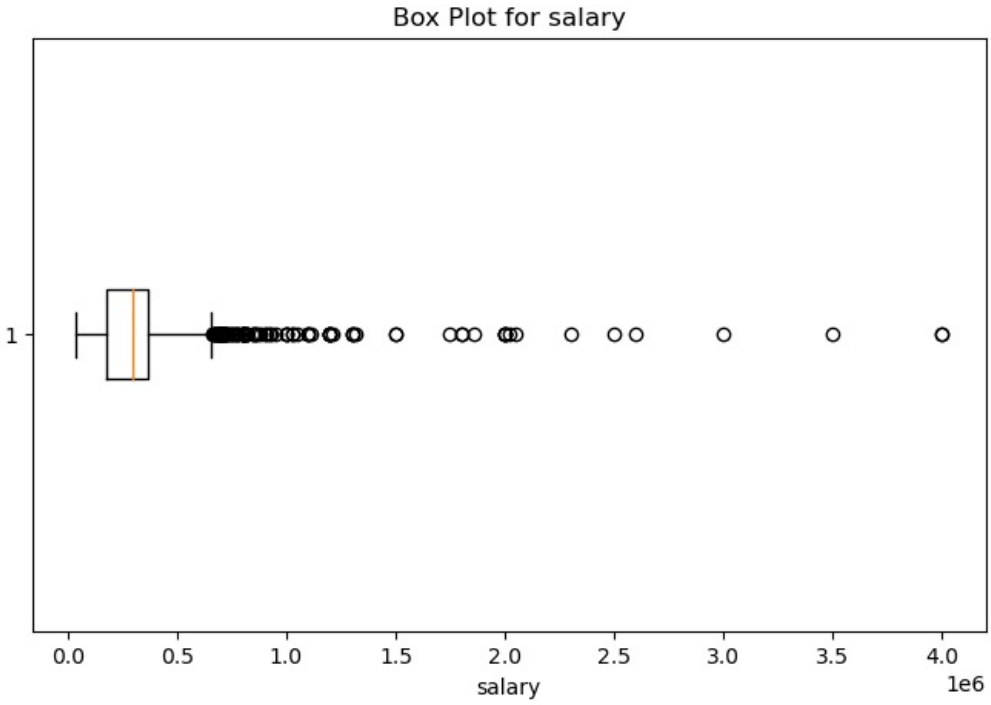

Distribution of specialization
Count
0
200
400
600
800
electronics and communication engineering
computer science & engineering
information technology
computer engineering
computer application
mechanical engineering
electronics and electrical engineering
electronics & telecommunications
electrical engineering
electronics & instrumentation eng
civil engineering
electronics and instrumentation engineering
information science engineering
instrumentation and control engineering
electronics engineering
biotechnology
other
industrial & production engineering
applied electronics and instrumentation
chemical engineering
computer science and technology
telecommunication engineering
mechanical and automation
automobile/automotive engineering
instrumentation engineering
mechatronics
aeronautical engineering
electronics and computer engineering
electrical and power engineering
biomedical engineering
information & communication technology
industrial engineering
computer science
metallurgical engineering
power systems and automation
control and instrumentation engineering
mechanical & production engineering
embedded systems technology
polymer technology
computer and communication engineering
information science
internal combustion engine
computer networking
ceramic engineering
electronics
industrial & management engineering
specialization

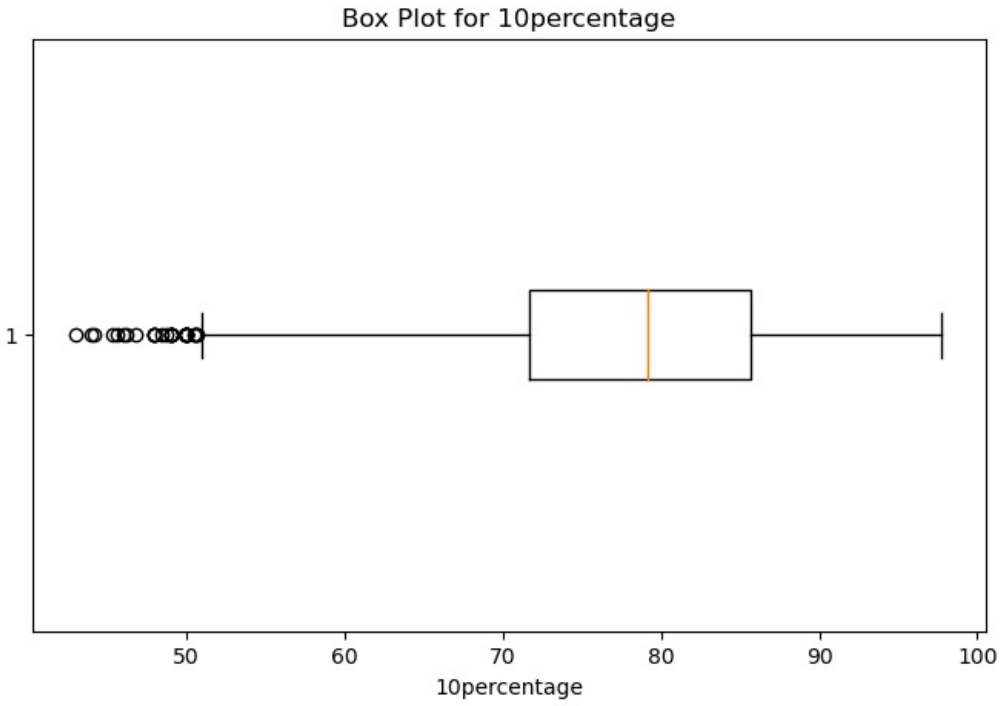


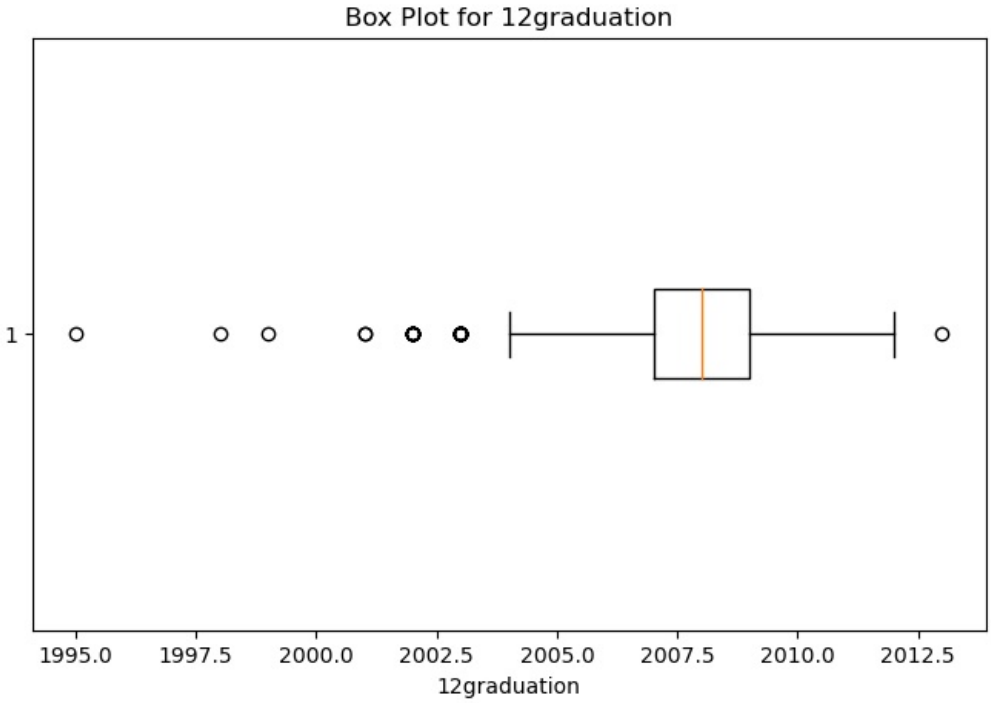
In [20]:

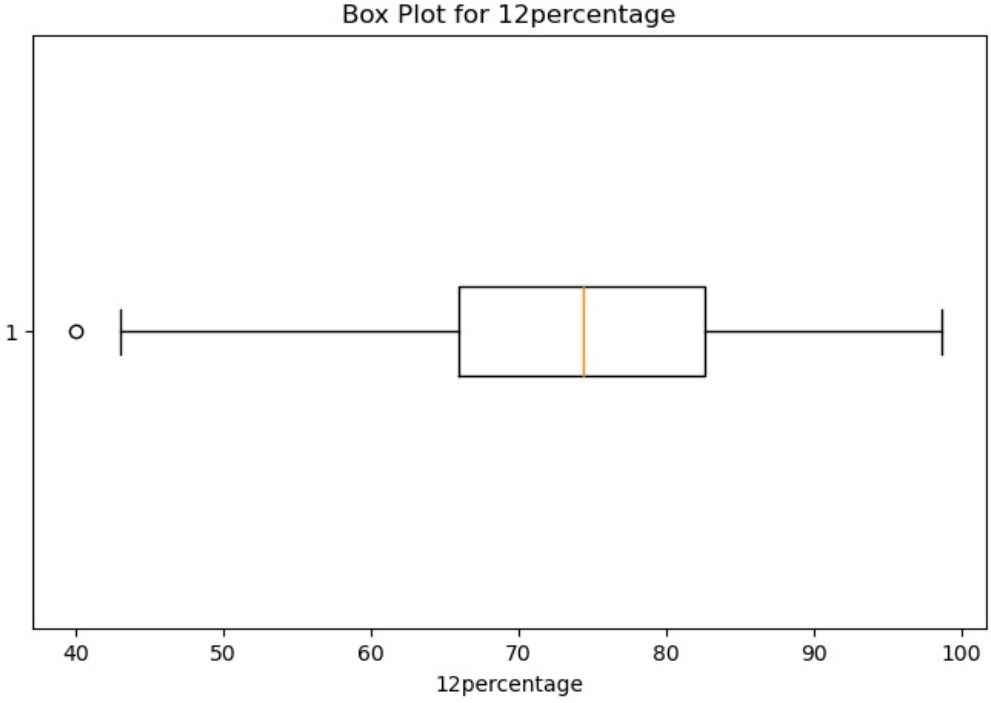
```python
import pandas as pd
import matplotlib.pyplot as plt

# Assuming df is your DataFrame and num_columns is your list of numerical columns
num_columns = ['id', 'salary', '10percentage', '12graduation', '12percentage',
       'collegeid', 'collegetier', 'collegegpa', 'collegecityid',
       'collegecitytier', 'graduationyear', 'english', 'logical', 'quant',
       'domain', 'computerprogramming', 'electronicsandsemicon',
       'computerscience', 'mechanicalengg', 'electricalengg', 'telecomengg',
       'civilengg', 'conscientiousness', 'agreeableness', 'extraversion',
       'nueroticism', 'openess_to_experience']

# Create box plots for each numerical column
for column in num_columns:
    plt.figure(figsize=(8, 5))
    plt.boxplot(df[column], vert=False)  # Horizontal box plot
    plt.xlabel(column)
    plt.title(f'Box Plot for {column}')
    plt.show()
```

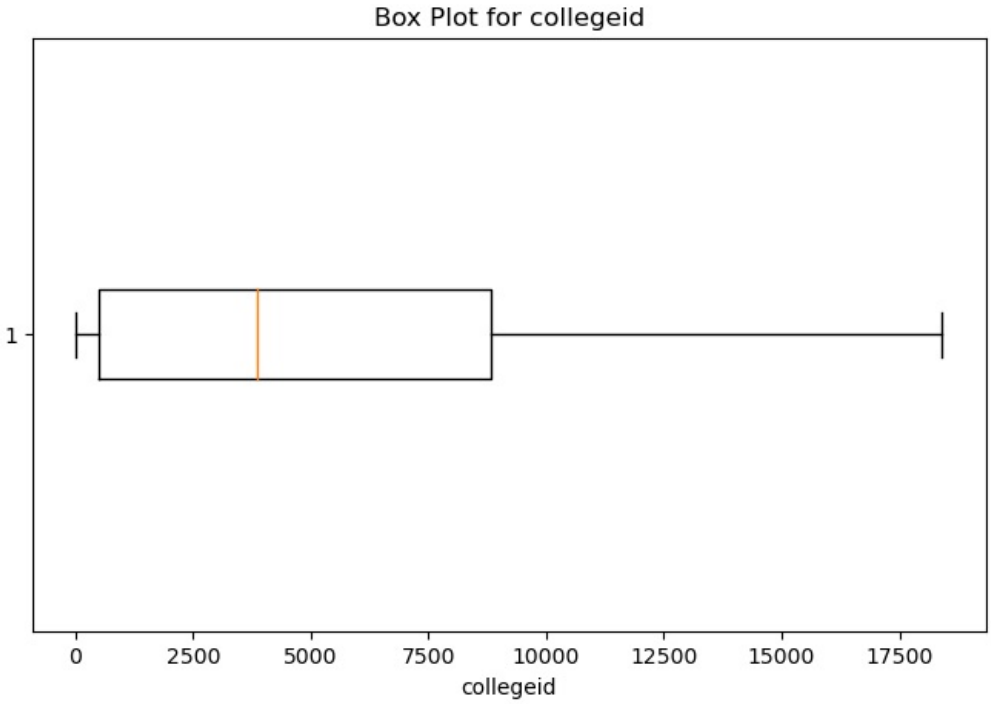


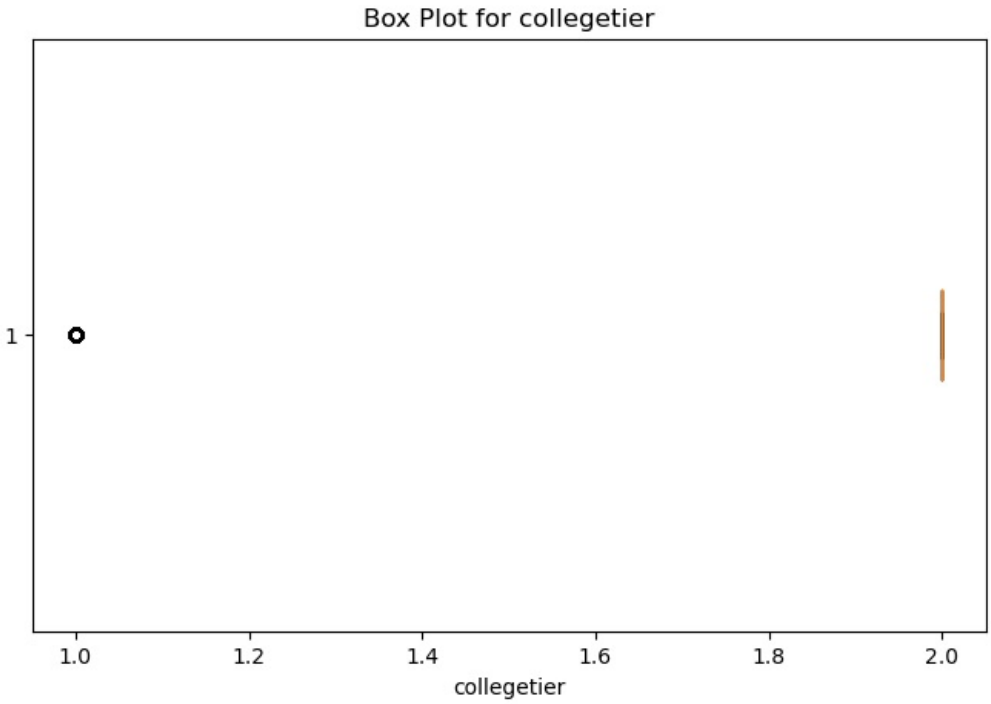

Box Plot for salary
1
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
salary
1e6

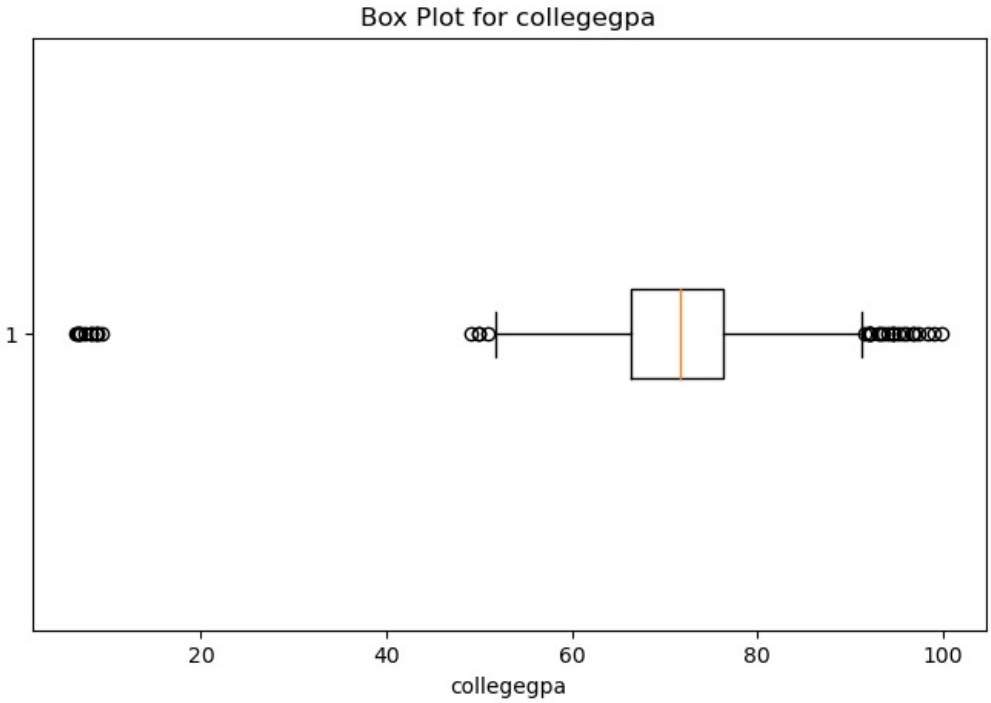

Box Plot for 10percentage
1
50
60
70
80
90
100
10percentage

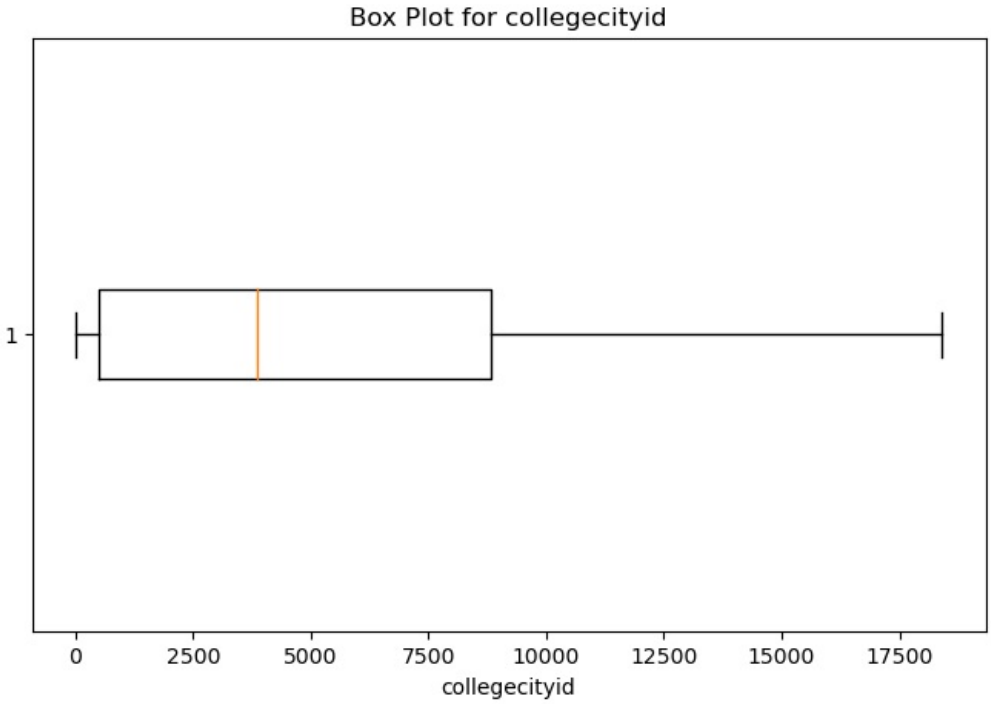

Box Plot for 12graduation
1
1995.0
1997.5
2000.0
2002.5
2005.0
2007.5
2010.0
2012.5
12graduation

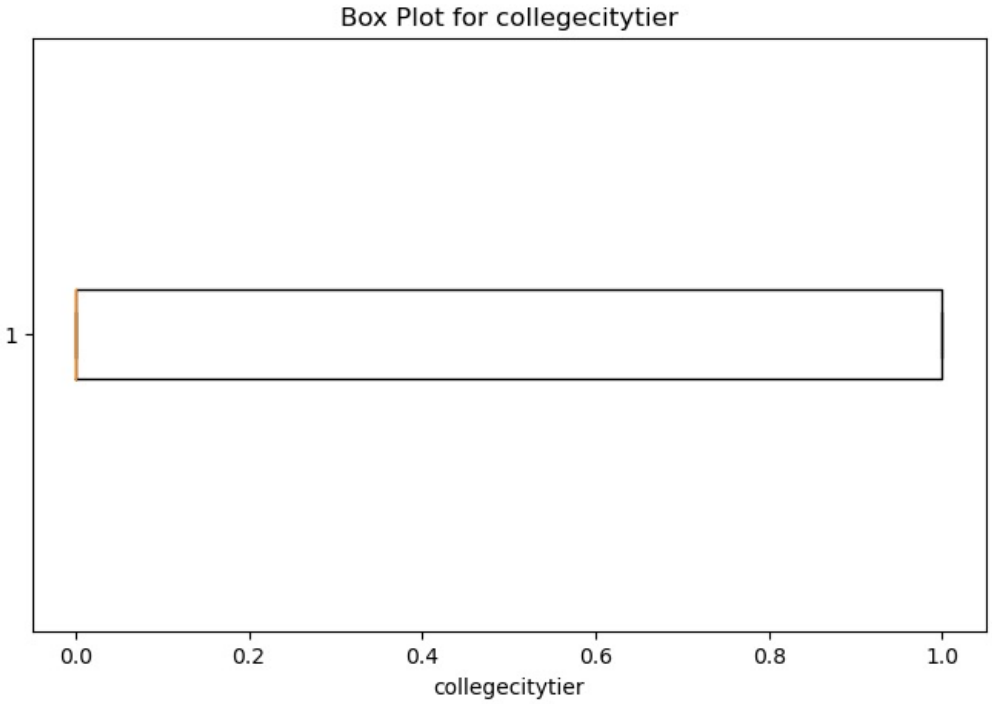

Box Plot for 12percentage
1
40
50
60
70
80
90
100
12percentage

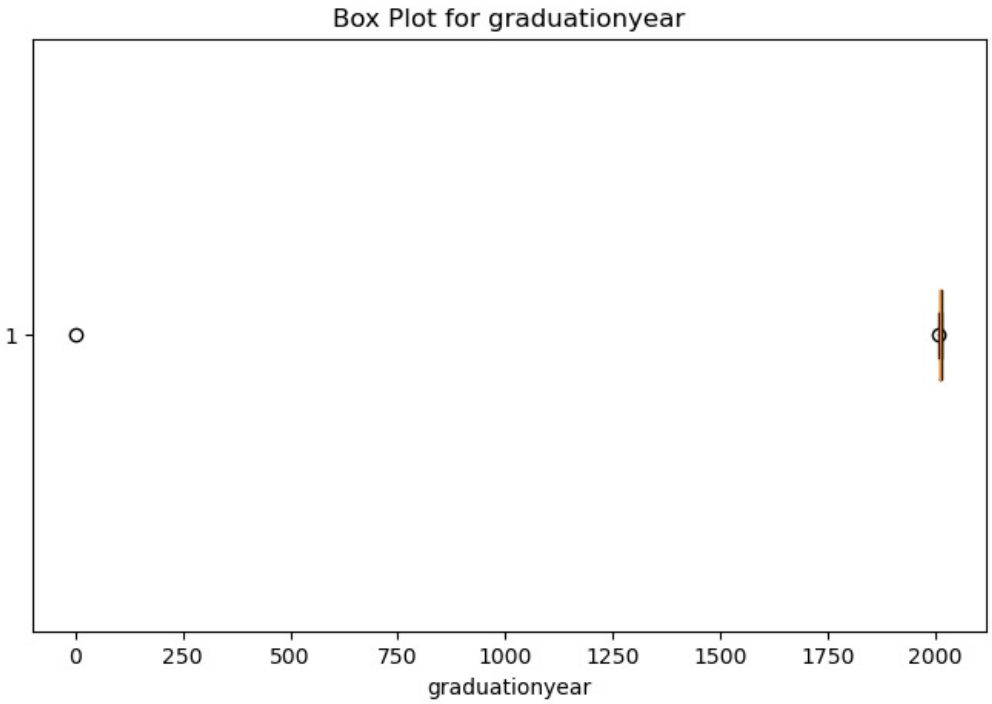

Box Plot for collegeid
1
0
2500
5000
7500
10000
12500
15000
17500
collegeid

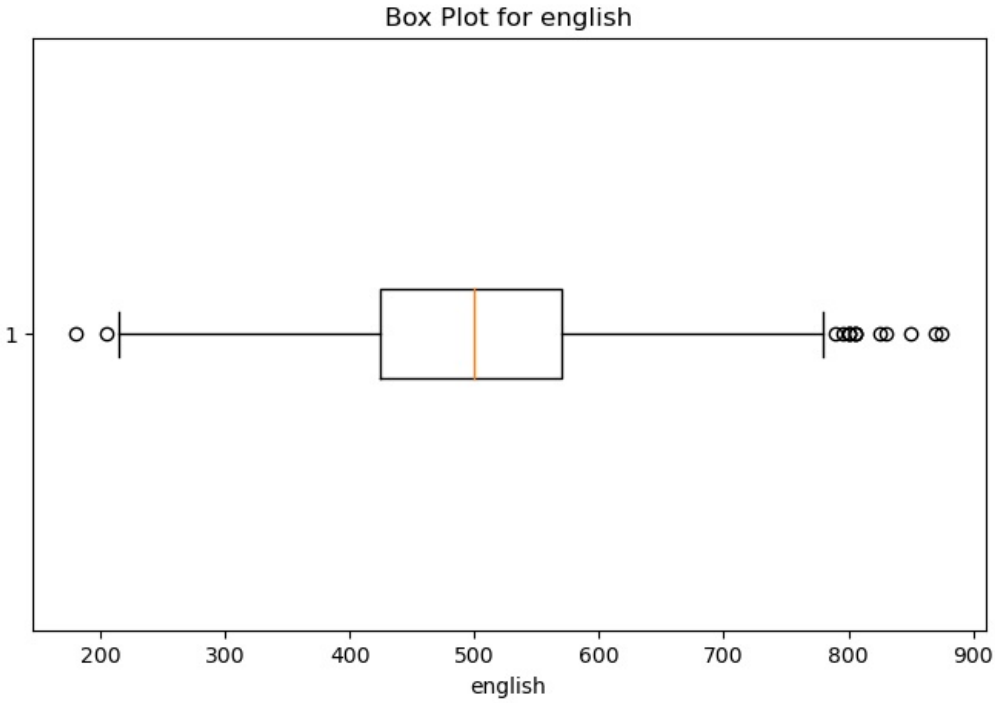

Box Plot for collegetier
1
1.0
1.2
1.4
1.6
1.8
2.0
collegetier

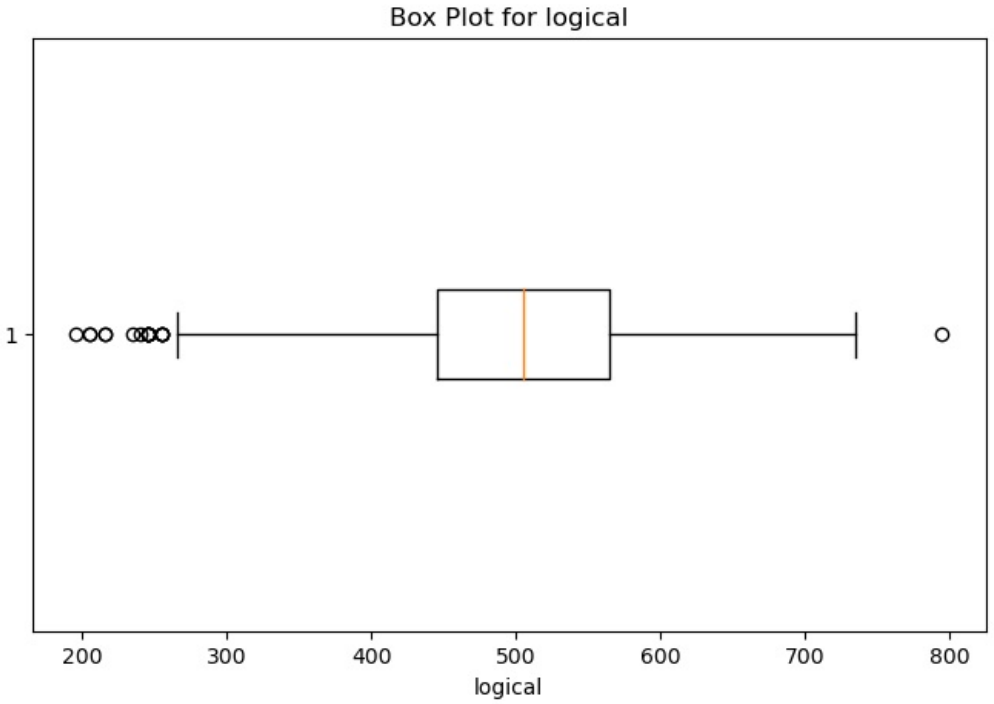

Box Plot for collegegpa
1
20
40
60
80
100
collegegpa

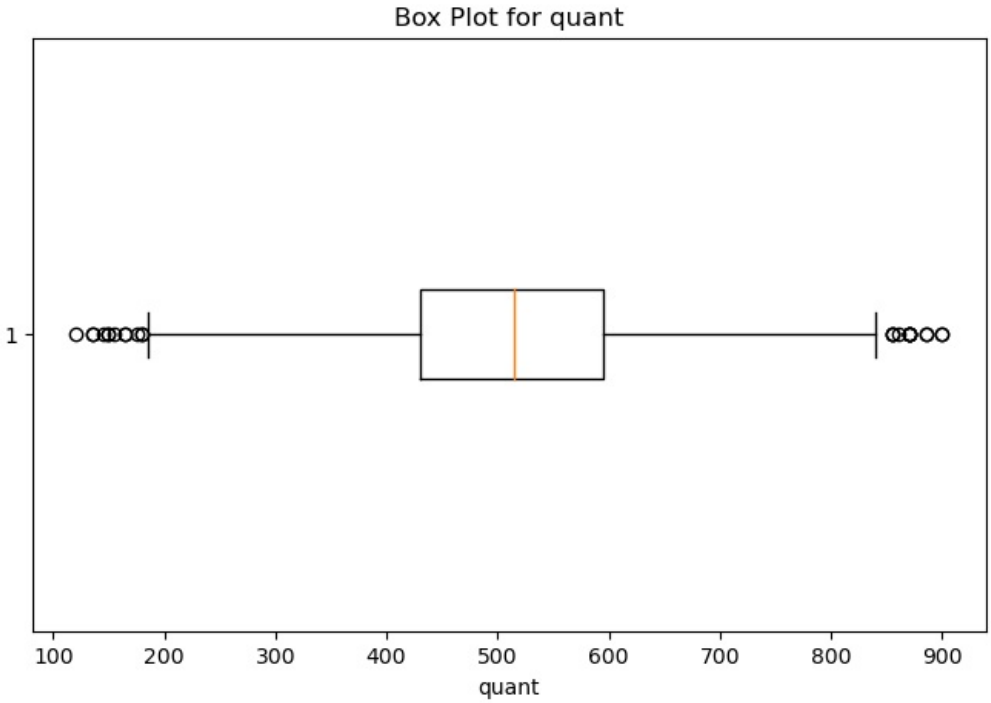

Box Plot for collegecityid
1
0
2500
5000
7500
10000
12500
15000
17500
collegecityid

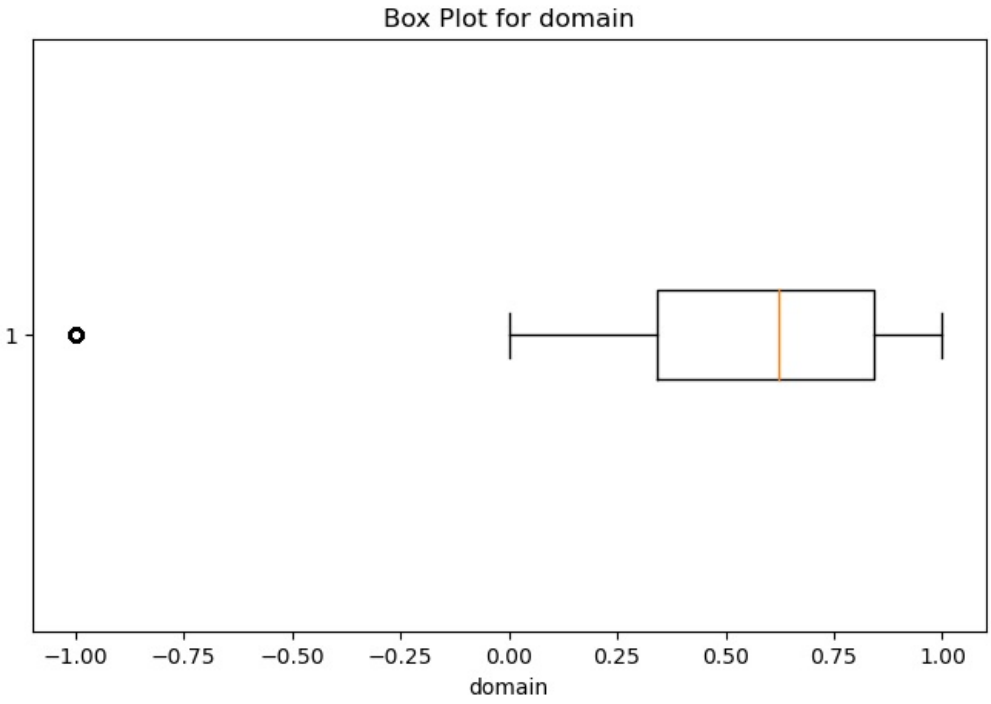

Box Plot for collegecitytier
1
0.0
0.2
0.4
0.6
0.8
1.0
collegecitytier

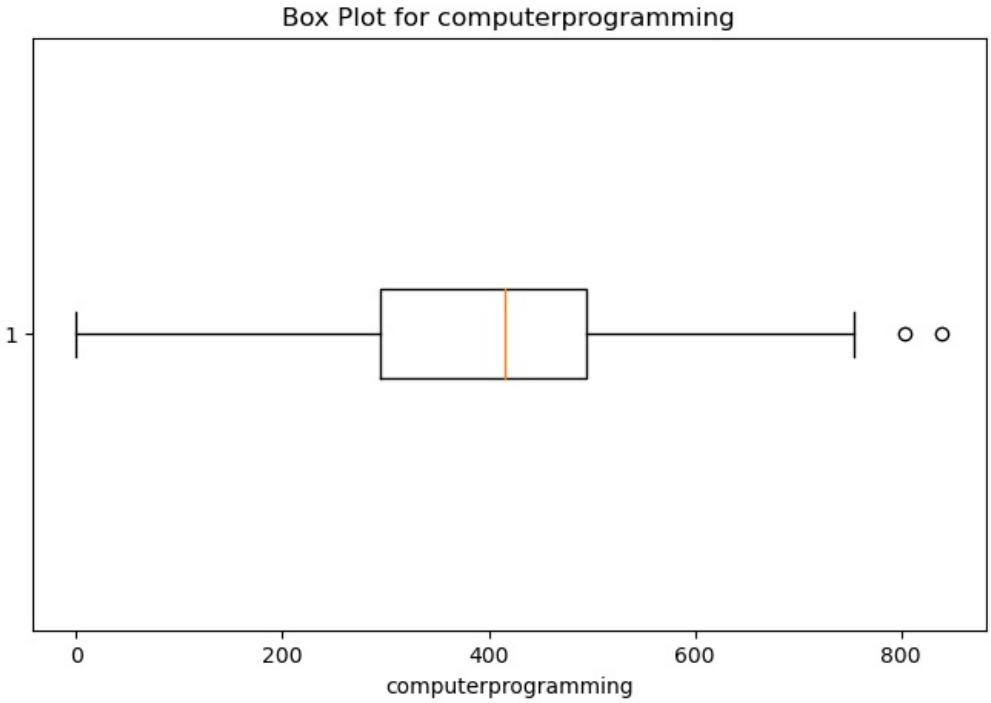

Box Plot for graduationyear
1
0
250
500
750
1000
1250
1500
1750
2000
graduationyear

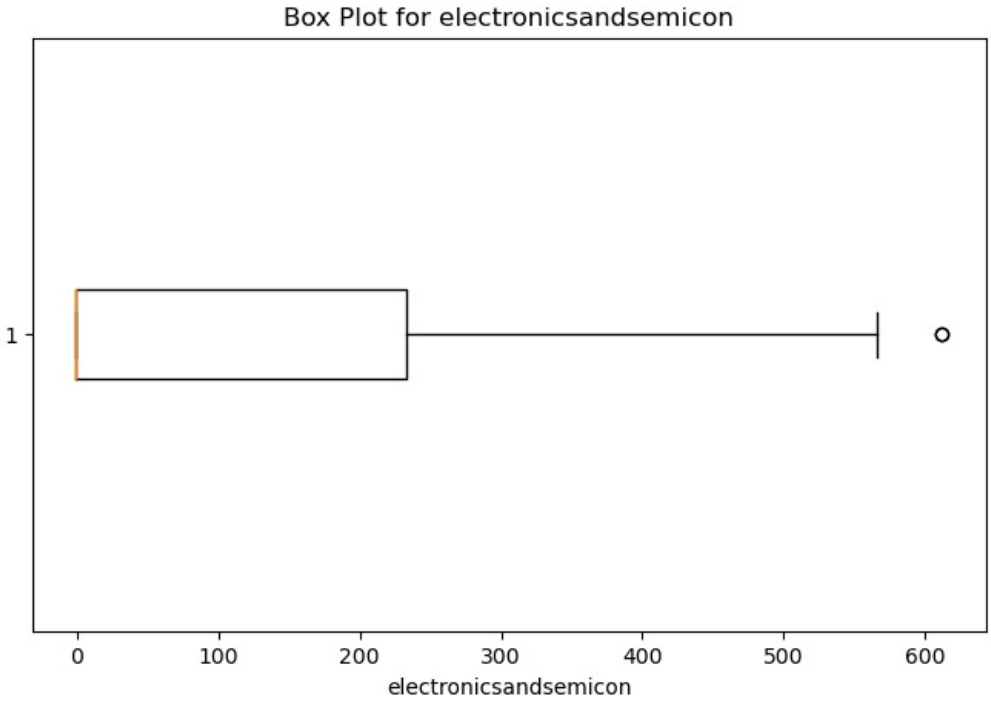

Box Plot for english
1
200
300
400
500
600
700
800
900
english

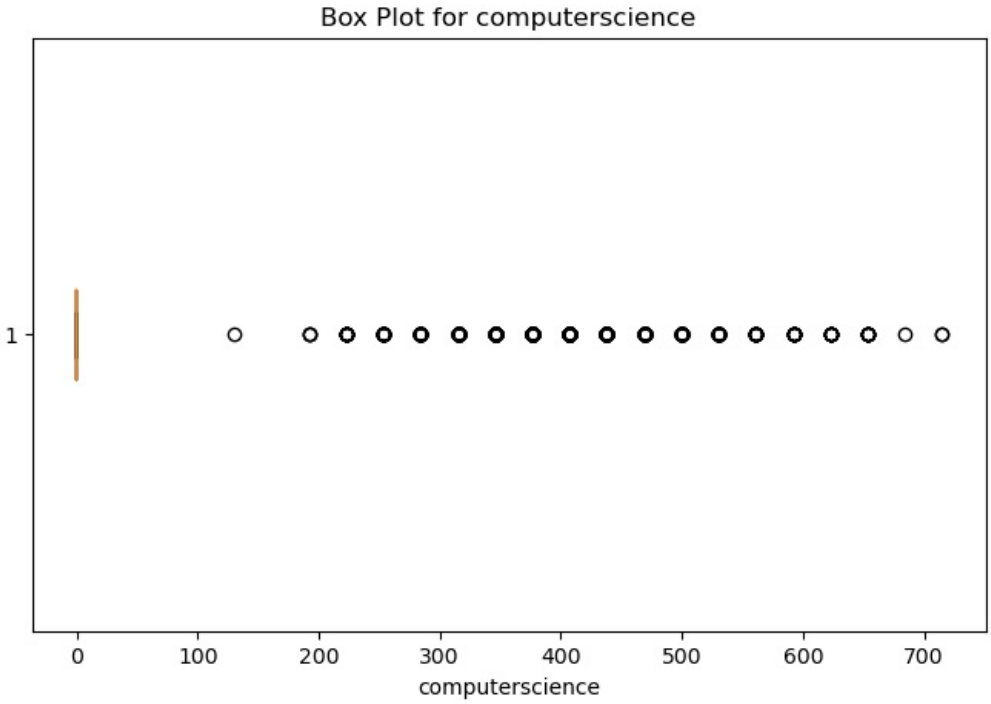

Box Plot for logical
1
200
300
400
500
600
700
800
logical

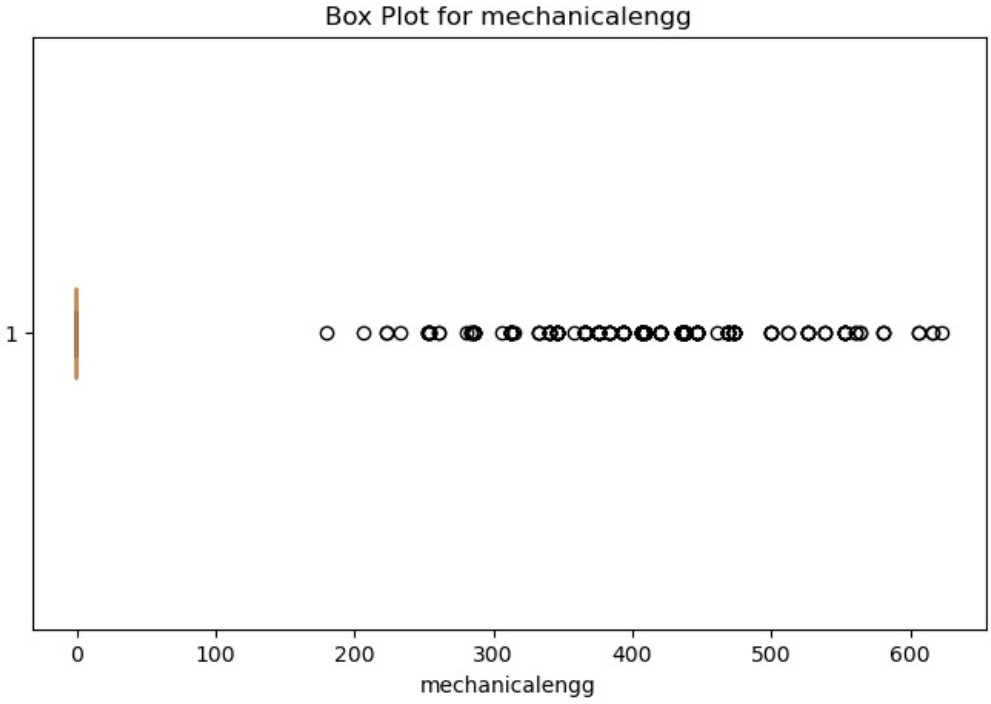

Box Plot for quant
1
100
200
300
400
500
600
700
800
900
quant

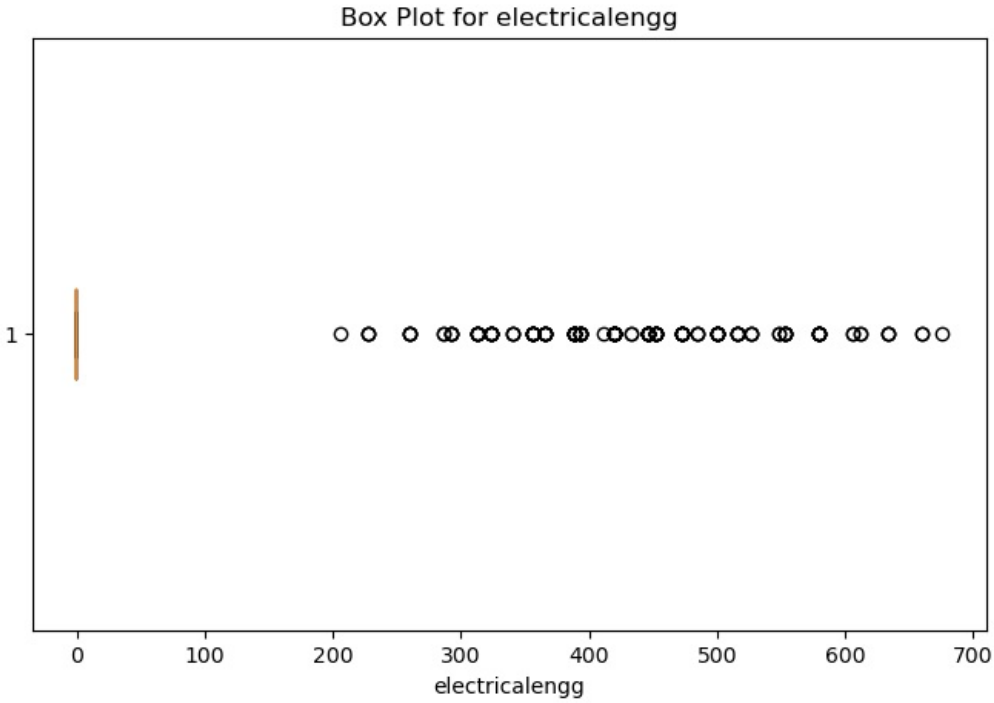

Box Plot for domain
1
−1.00
−0.75
−0.50
−0.25
0.00
0.25
0.50
0.75
1.00
domain

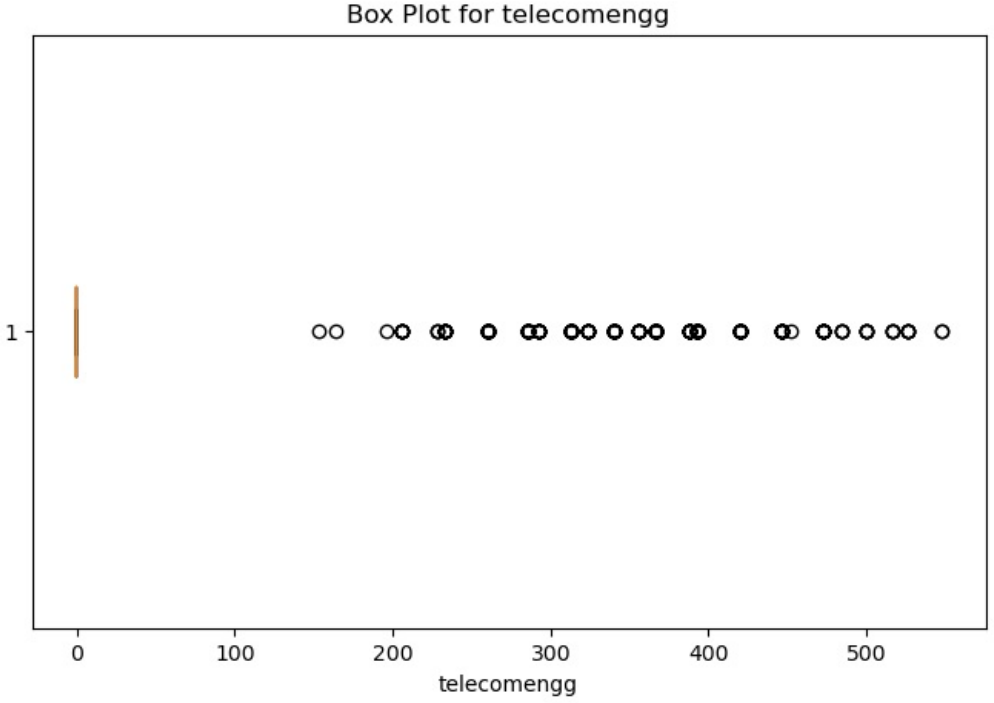

Box Plot for computerprogramming
1
0
200
400
600
800
computerprogramming

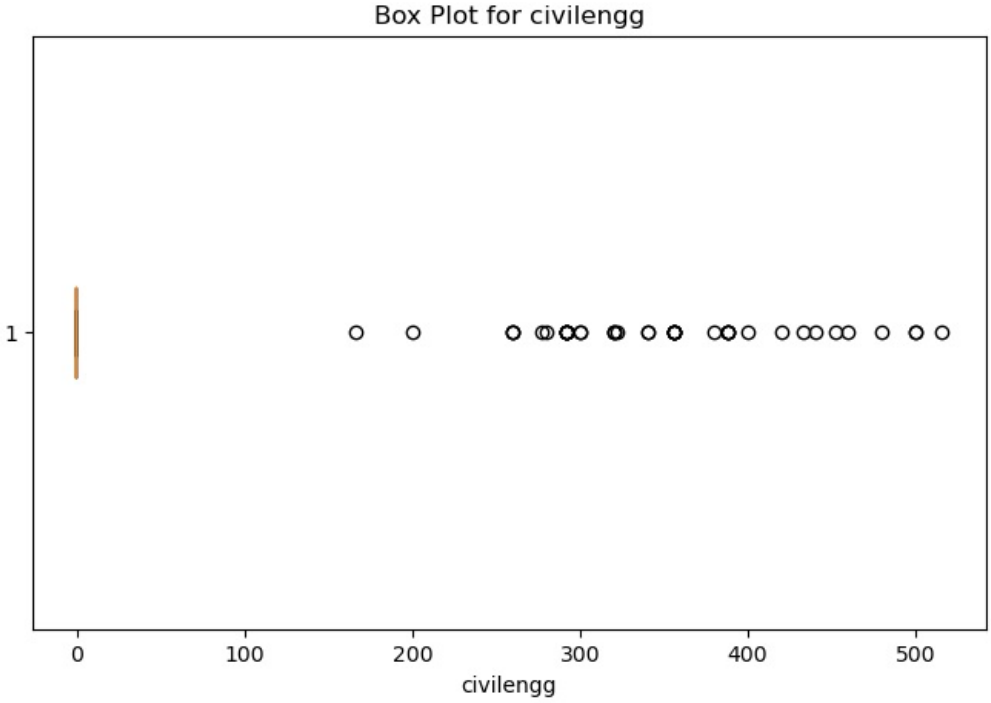

Box Plot for electronicsandsemicon
1
0
100
200
300
400
500
600
electronicsandsemicon

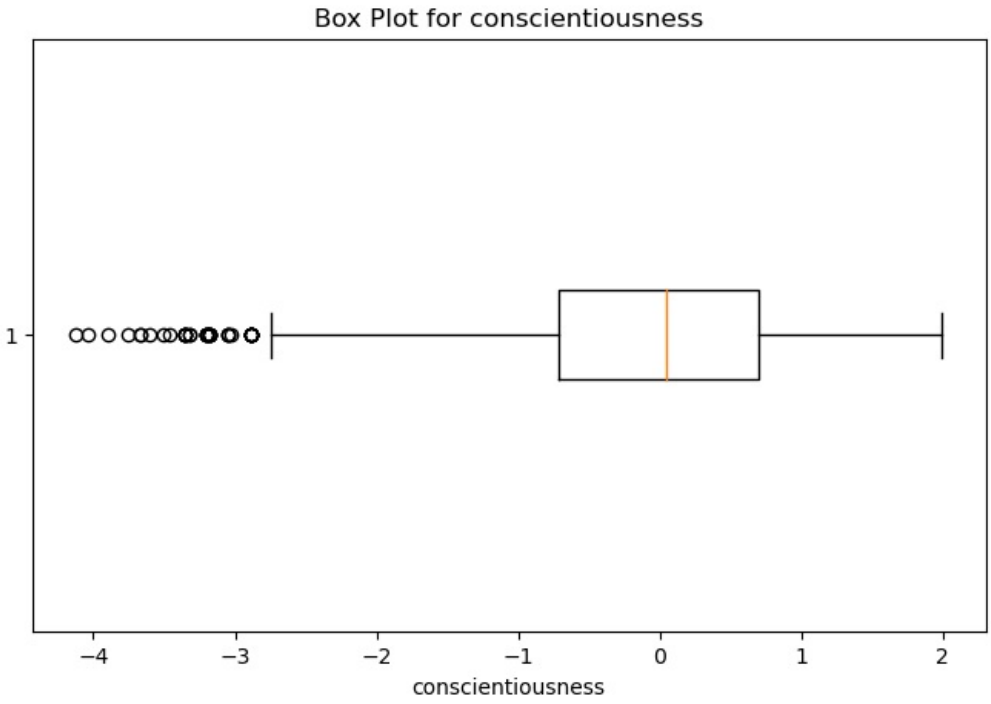

Box Plot for computerscience
1
0
100
200
300
400
500
600
700
computerscience

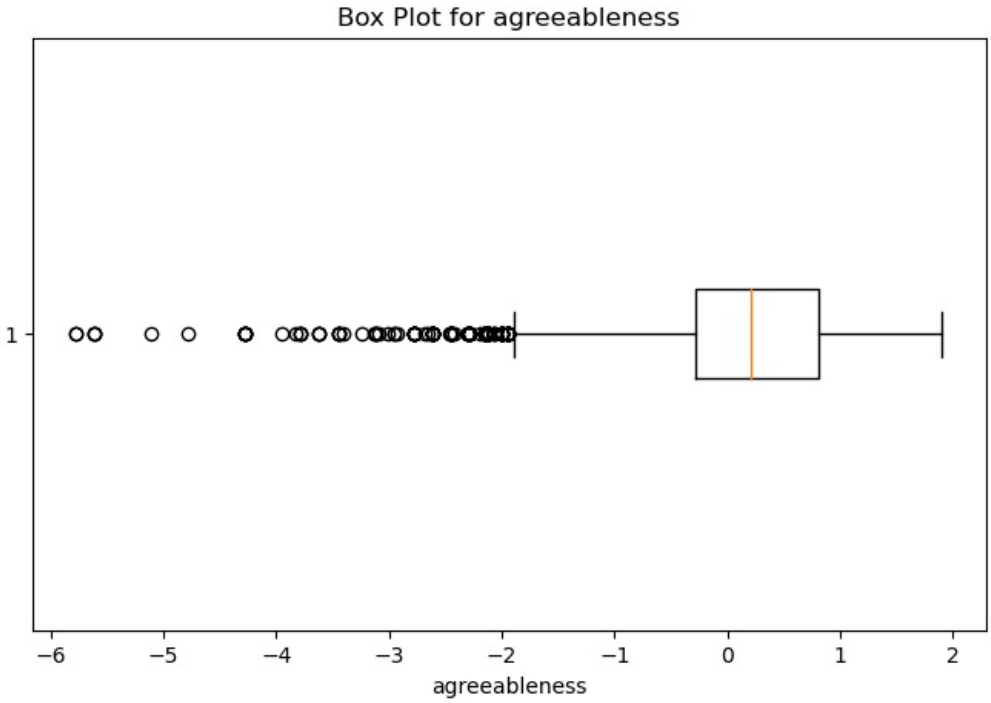

Box Plot for mechanicalengg
1
0
100
200
300
400
500
600
mechanicalengg

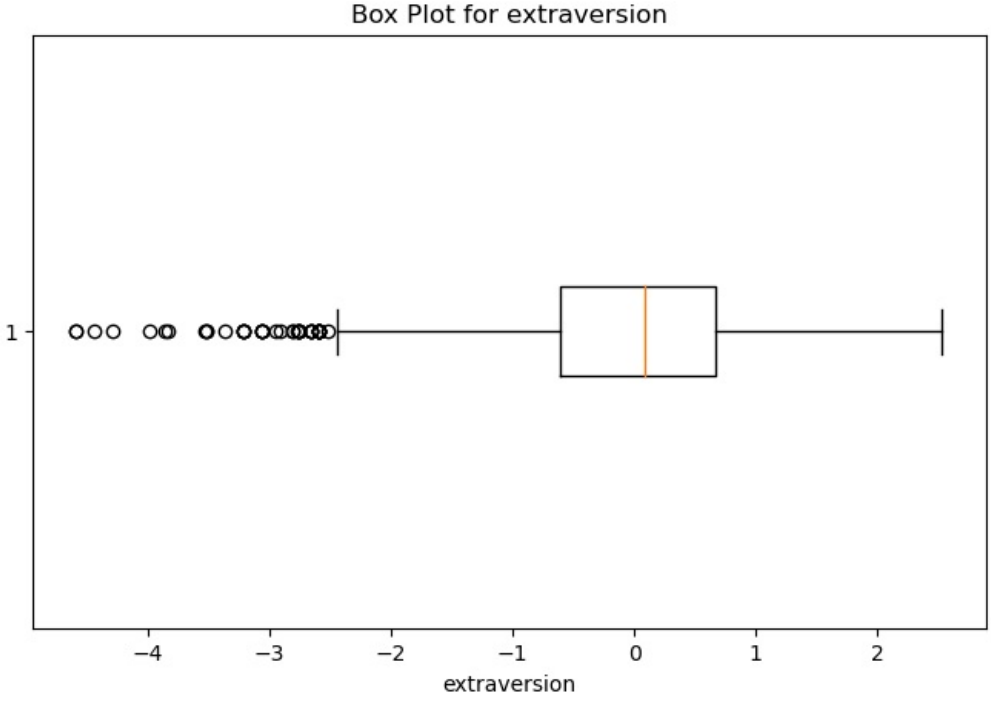

Box Plot for electricalengg
1
0
100
200
300
400
500
600
700
electricalengg

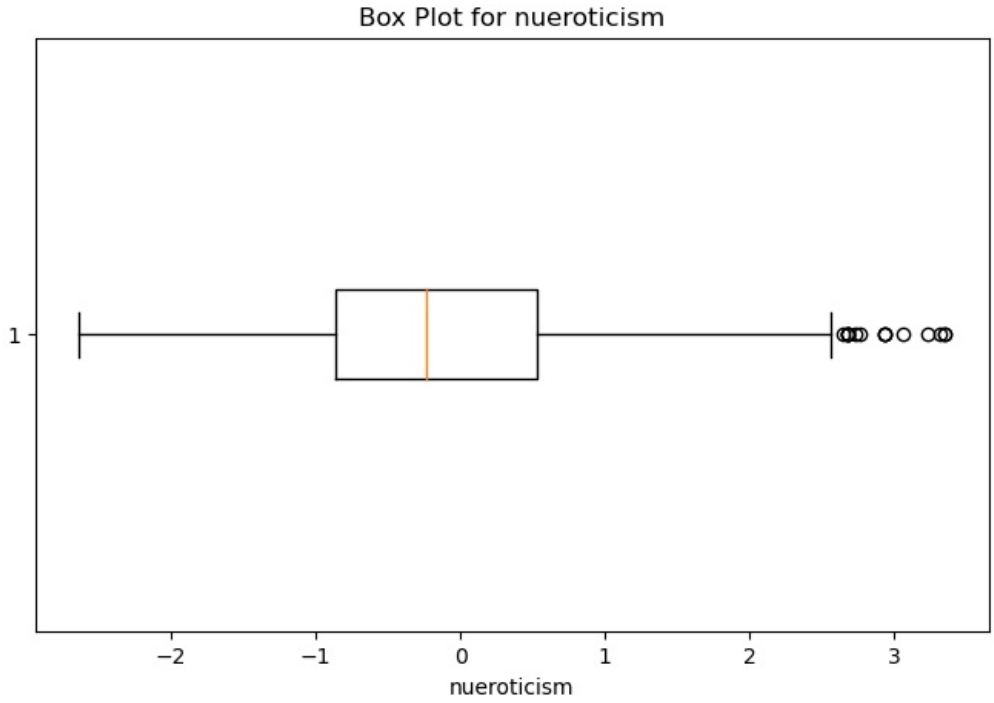

Box Plot for telecomengg
1
0
100
200
300
400
500
telecomengg

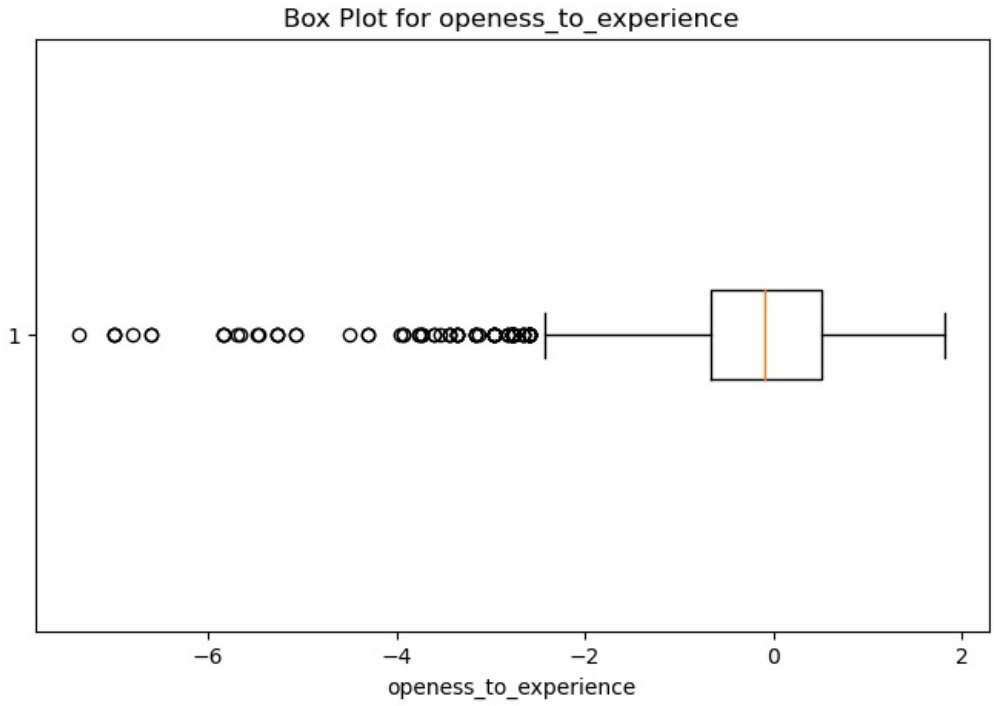

Box Plot for civilengg
1
0
100
200
300
400
500
civilengg


Box Plot for conscientiousness
1
−4
−3
−2
−1
0
1
2
conscientiousness


Box Plot for agreeableness
1
−6
−5
−4
−3
−2
−1
0
1
2
agreeableness


Box Plot for extraversion
1
−4
−3
−2
−1
0
1
2
extraversion

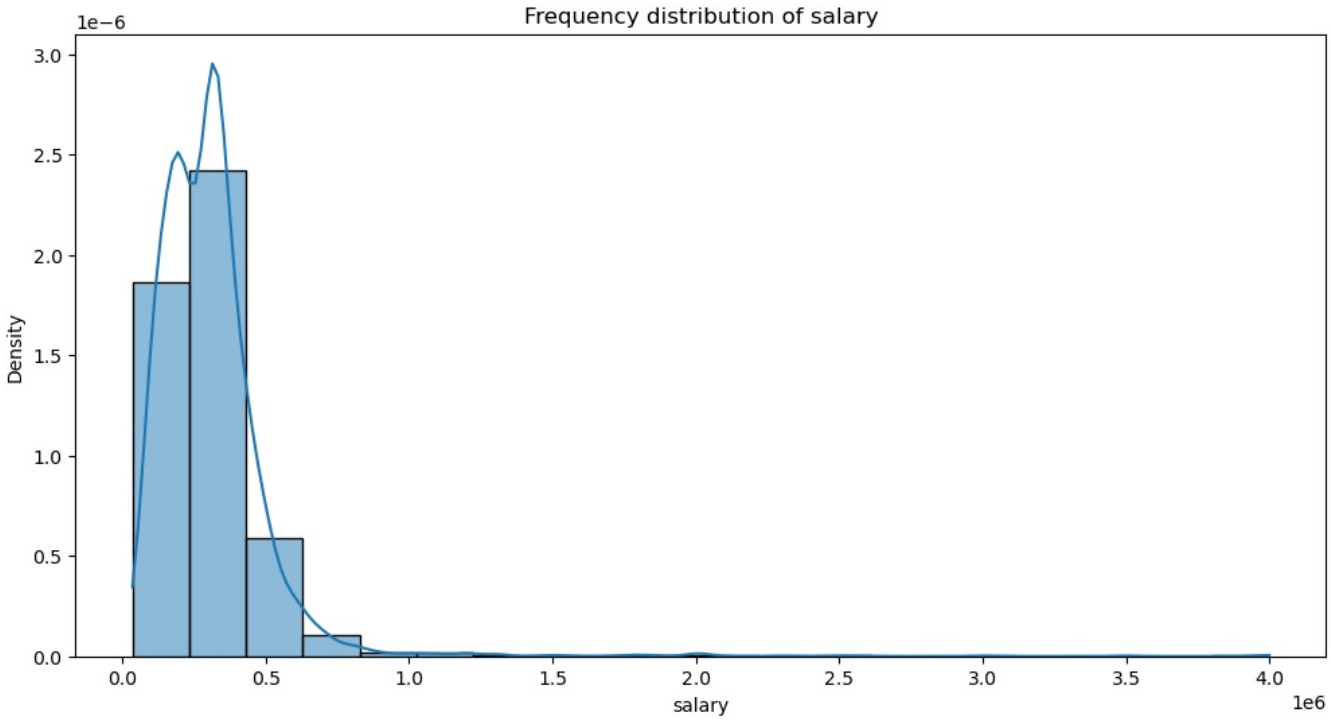




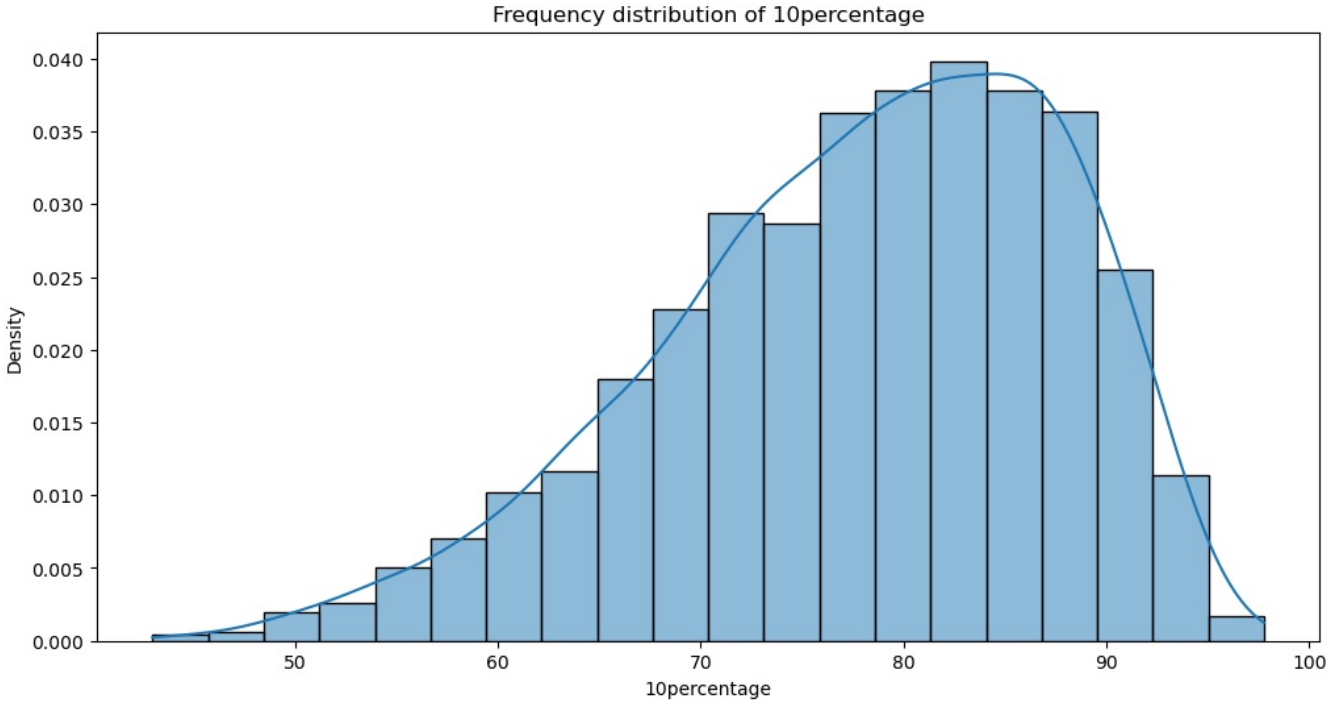
In [21]:

```
#The probability and frequency distribution of each numerical column
import warnings
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt

# Assuming df is your DataFrame and num_columns is your list of numerical columns
num_columns =['salary', '10percentage', '12percentage', 'collegegpa','english', 'logical',
 'quant', 'computerprogramming', 'computerscience',
 'mechanicalengg',
 'electricalengg', 'telecomengg', 'civilengg',
 'conscientiousness',
 'agreeableness', 'extraversion', 'nueroticism',
 'openess_to_experience']


warnings.filterwarnings('ignore')

# Loop through each numerical column starting from the second column
for column in num_columns:
    plt.figure(figsize=(12, 6))

    # Use df[column] to access the column data
```

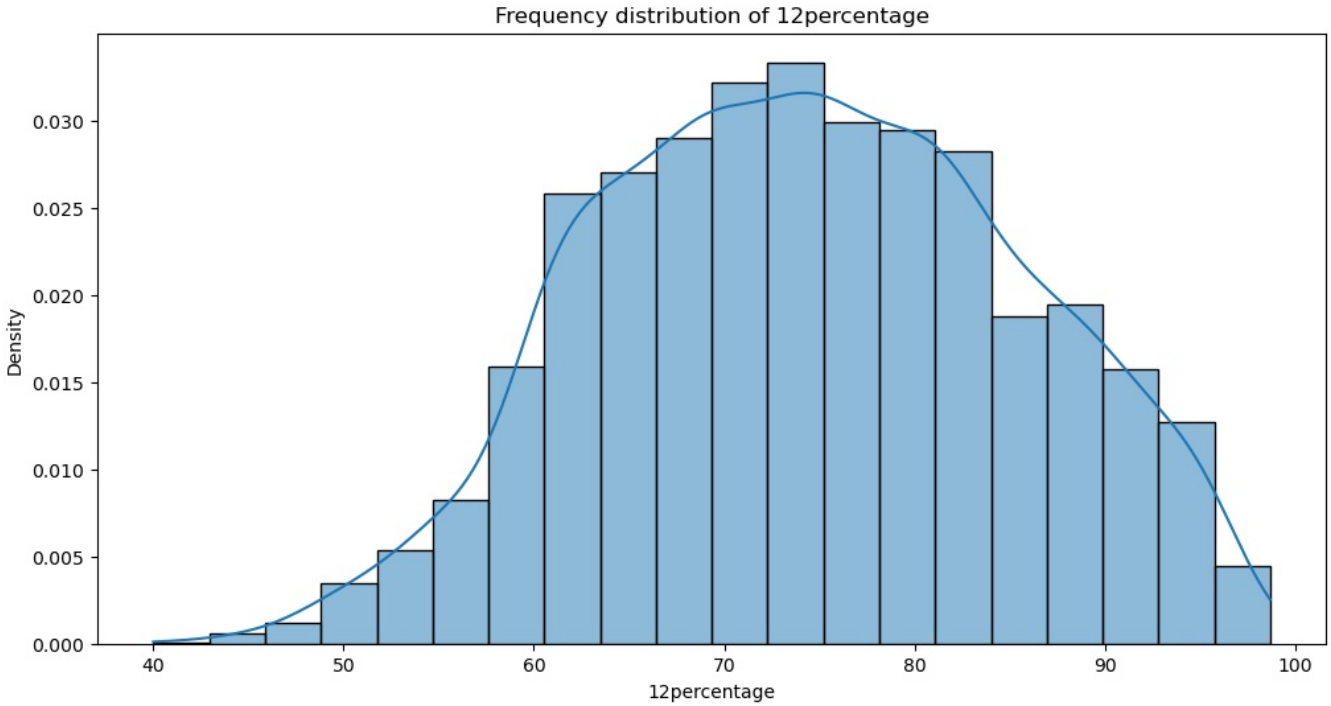
```
    sns.histplot(df[column], bins=20, kde=True, stat='density')

    plt.title(f"Frequency distribution of {column}")
    plt.xlabel(column)
    plt.ylabel('Density')

    # Show the plot
    plt.show()

    # Calculate and print the probability distribution
    prob_dist = df[column].value_counts(normalize=True)
    print(f"Probability distribution of {column}: \n{prob_dist}\n")
```



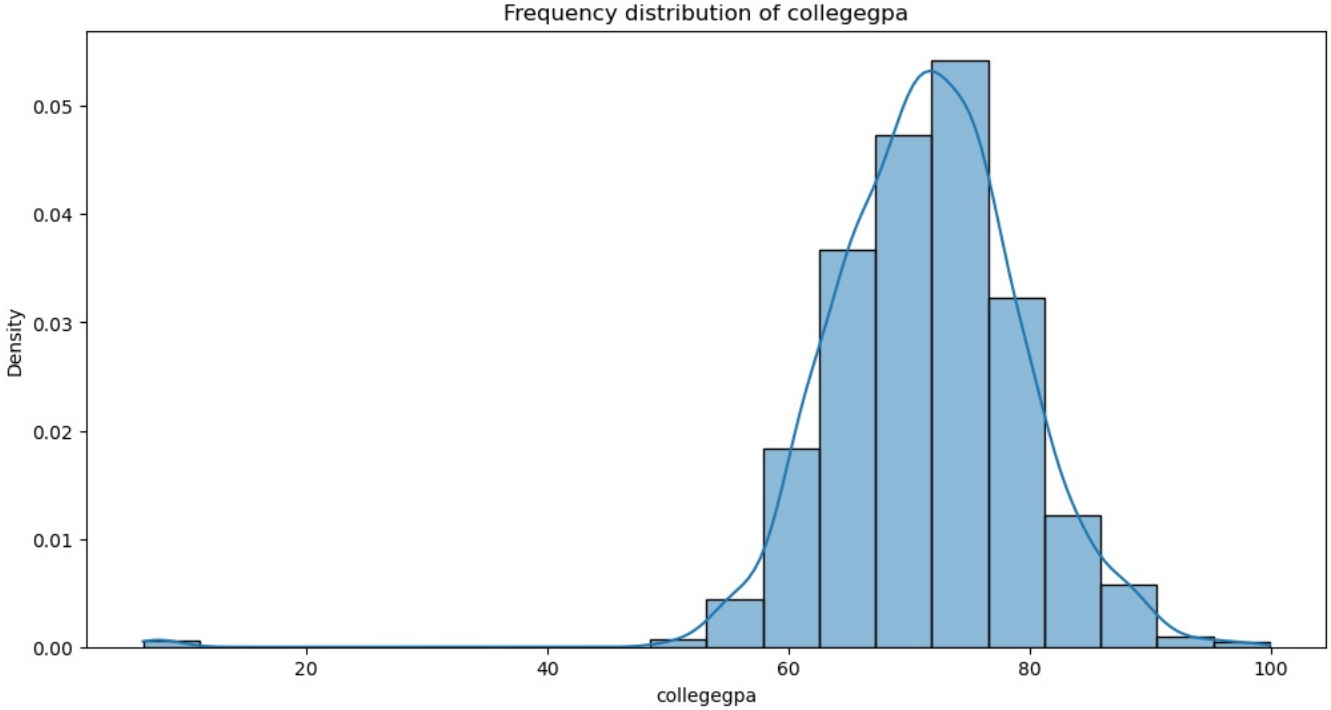

```
Probability distribution of salary:
300000     0.073287
180000     0.059780
200000     0.051276
325000     0.047024
120000     0.041271
             ...
2050000    0.000250
144000     0.000250
1320000    0.000250
755000     0.000250
925000     0.000250
Name: salary, Length: 177, dtype: float64
```



```
Probability distribution of 10percentage:
78.00    0.019010
82.00    0.017759
85.00    0.016758
76.00    0.016508
80.00    0.016258
           ...
82.56    0.000250
87.04    0.000250
81.14    0.000250
61.75    0.000250
78.72    0.000250
Name: 10percentage, Length: 851, dtype: float64
```

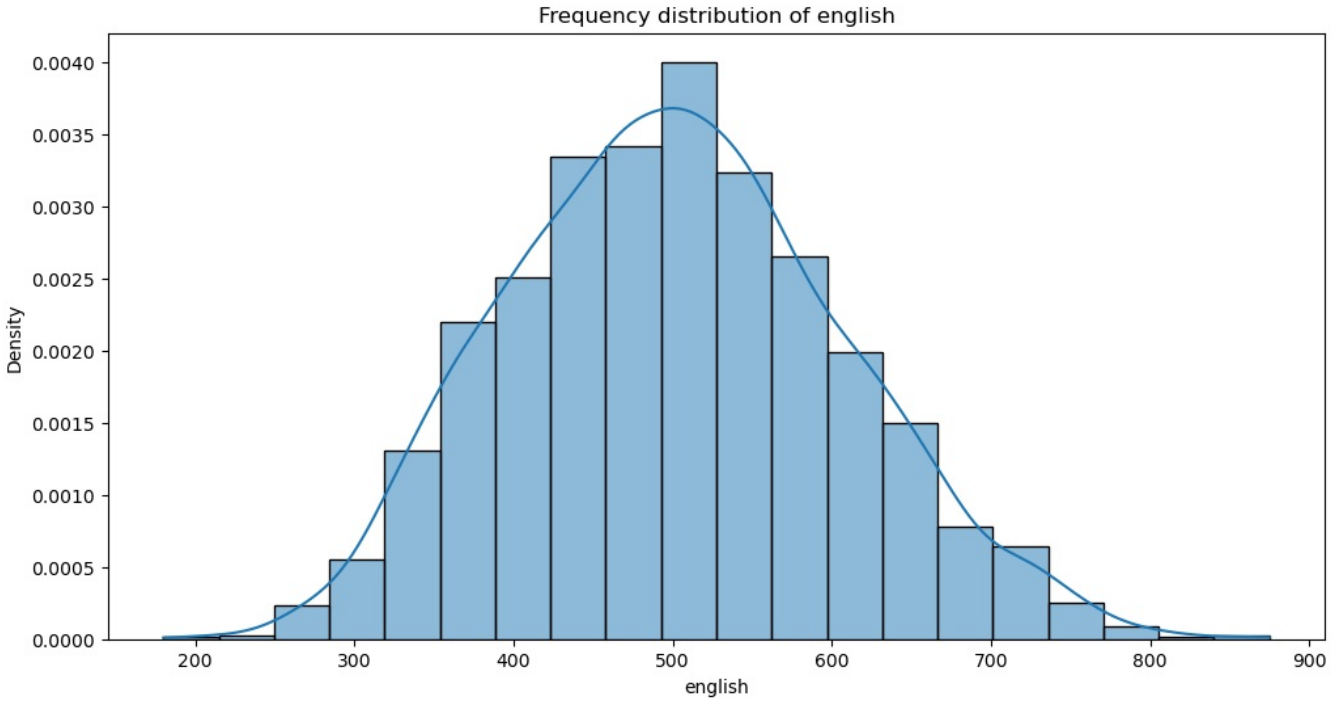



```
Probability distribution of 12percentage:
70.00    0.018009
72.00    0.017009
74.00    0.015758
62.00    0.014507
68.00    0.014507
           ...
58.50    0.000250
74.45    0.000250
95.41    0.000250
83.58    0.000250
82.55    0.000250
Name: 12percentage, Length: 801, dtype: float64
```



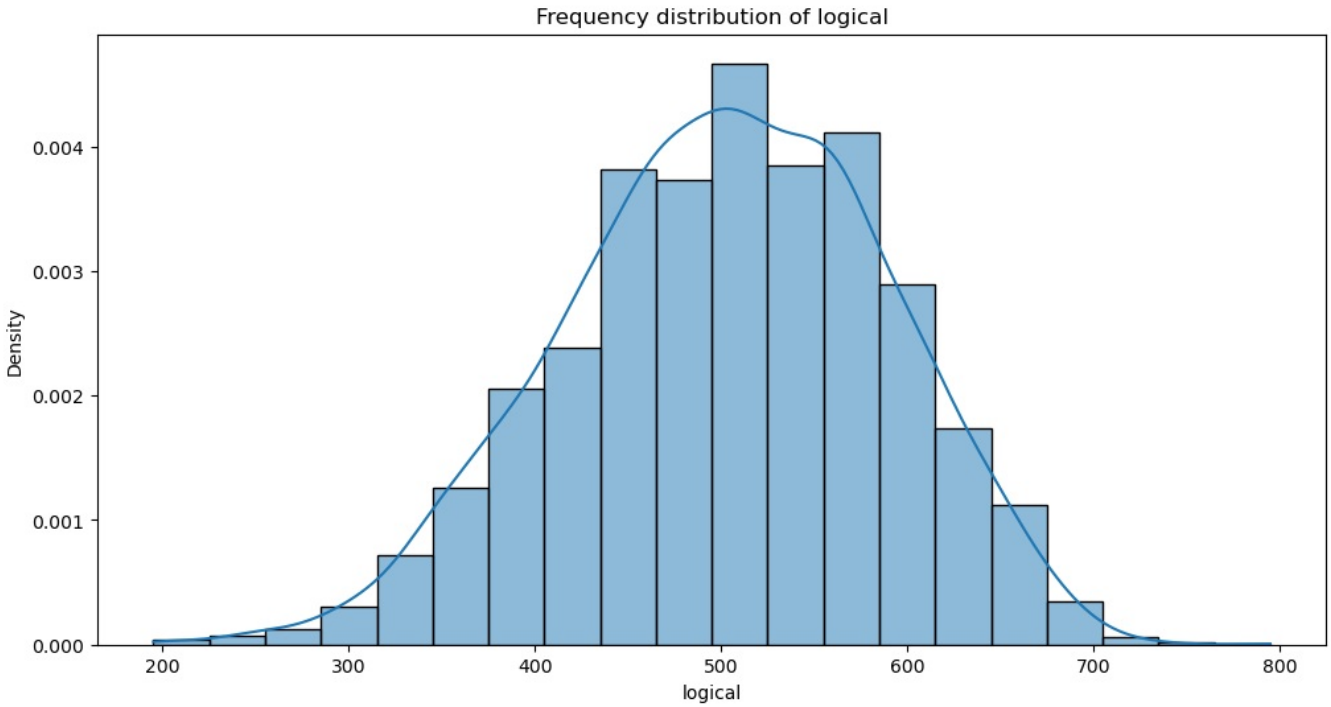
Probability distribution of collegegpa:

```
70.00    0.028014
72.00    0.024762
75.00    0.020760
65.00    0.019760
71.00    0.018759
           ...
71.68    0.000250
73.15    0.000250
90.01    0.000250
71.36    0.000250
70.42    0.000250
Name: collegegpa, Length: 1282, dtype: float64
```



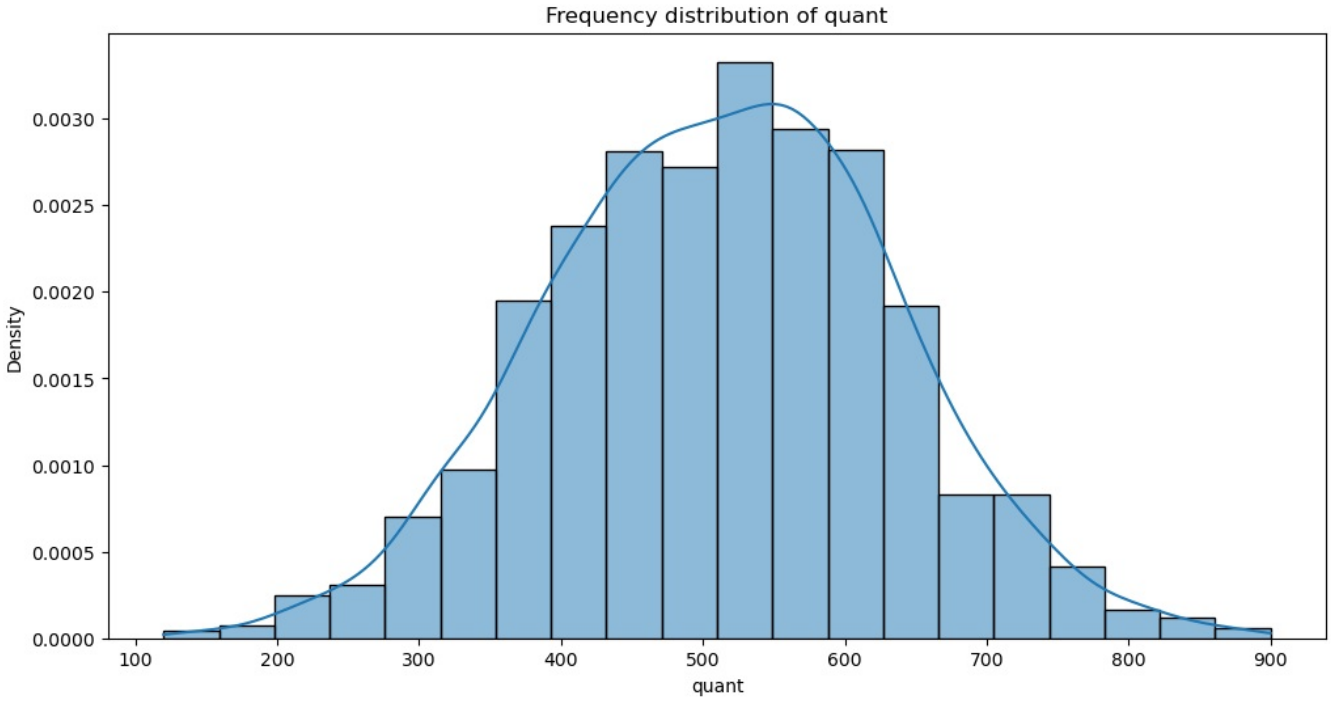
Probability distribution of english:

```
475    0.040020
545    0.037769
465    0.037519
535    0.034517
405    0.027764
         ...
180    0.000250
875    0.000250
825    0.000250
870    0.000250
334    0.000250
Name: english, Length: 111, dtype: float64
```



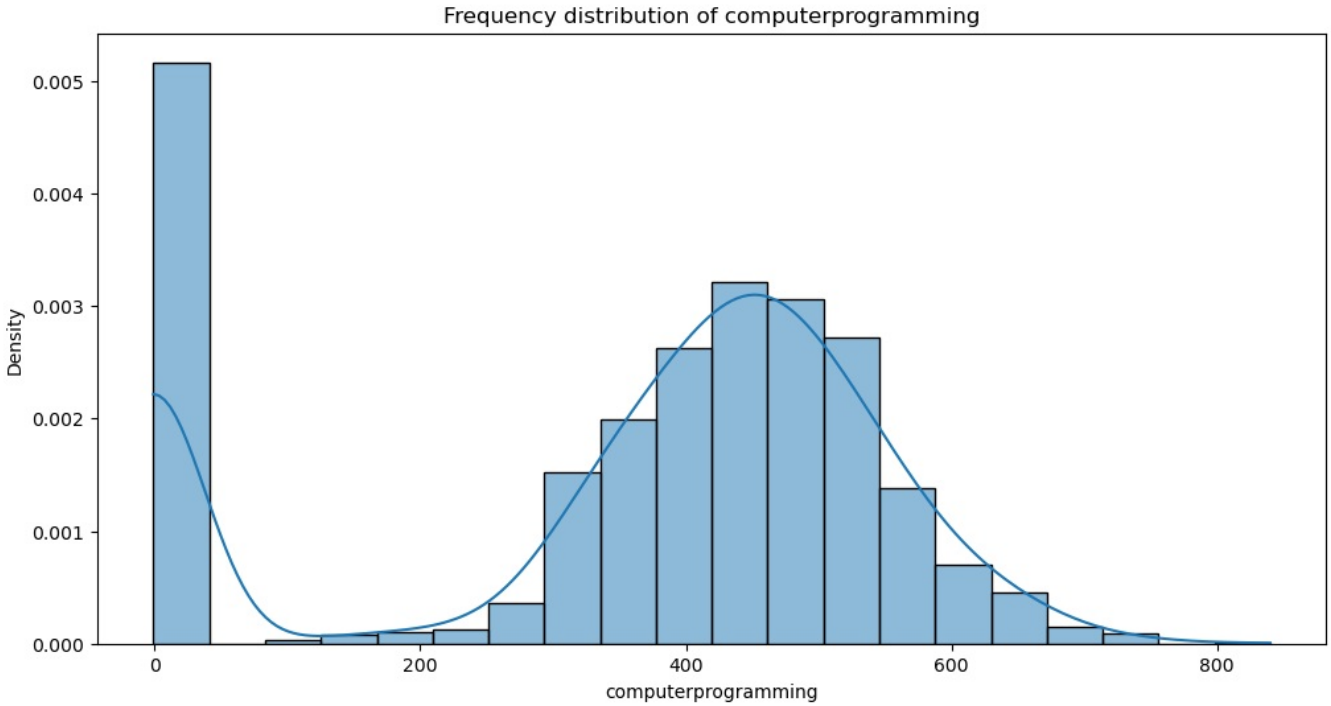
Probability distribution of logical:

```
495    0.039520
545    0.037769
555    0.037769
485    0.037769
505    0.029265
         ...
310    0.000250
795    0.000250
534    0.000250
454    0.000250
660    0.000250
Name: logical, Length: 107, dtype: float64
```



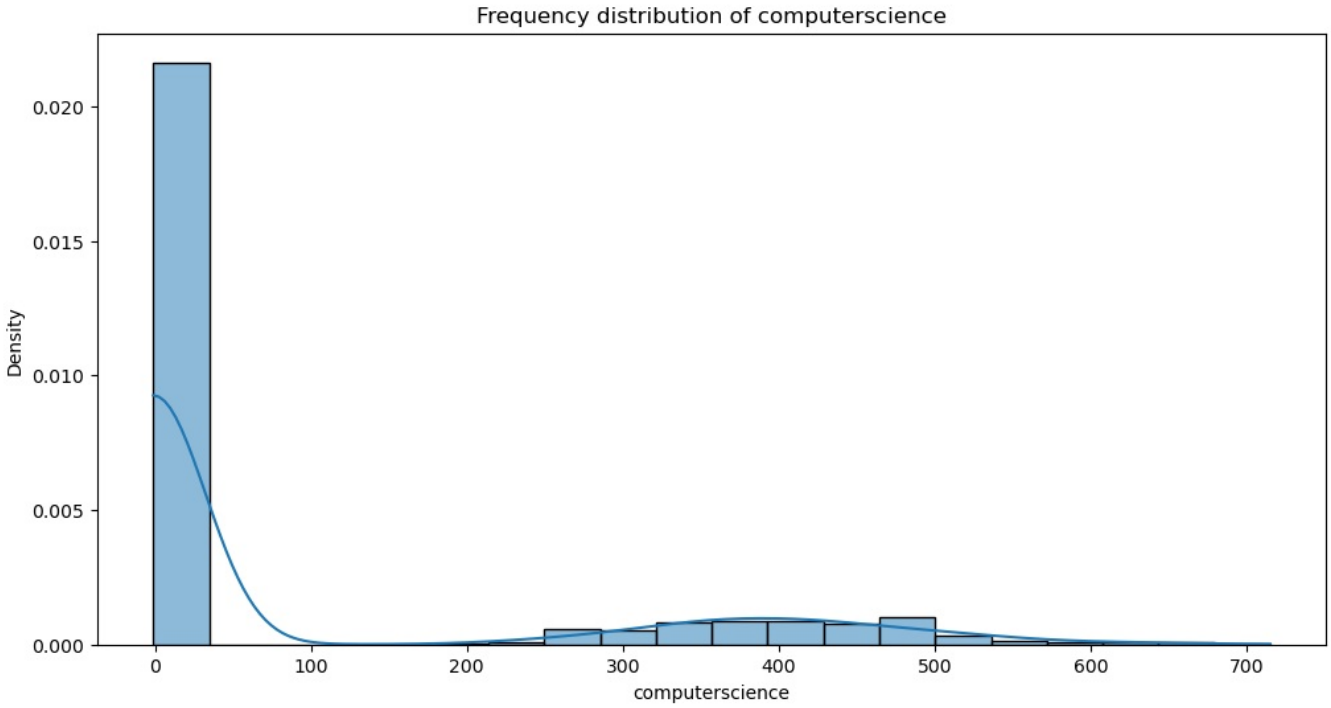
Probability distribution of quant:

```
605    0.035768
485    0.032516
545    0.031266
575    0.029015
515    0.024762
         ...
805    0.000250
175    0.000250
214    0.000250
860    0.000250
394    0.000250
Name: quant, Length: 138, dtype: float64
```



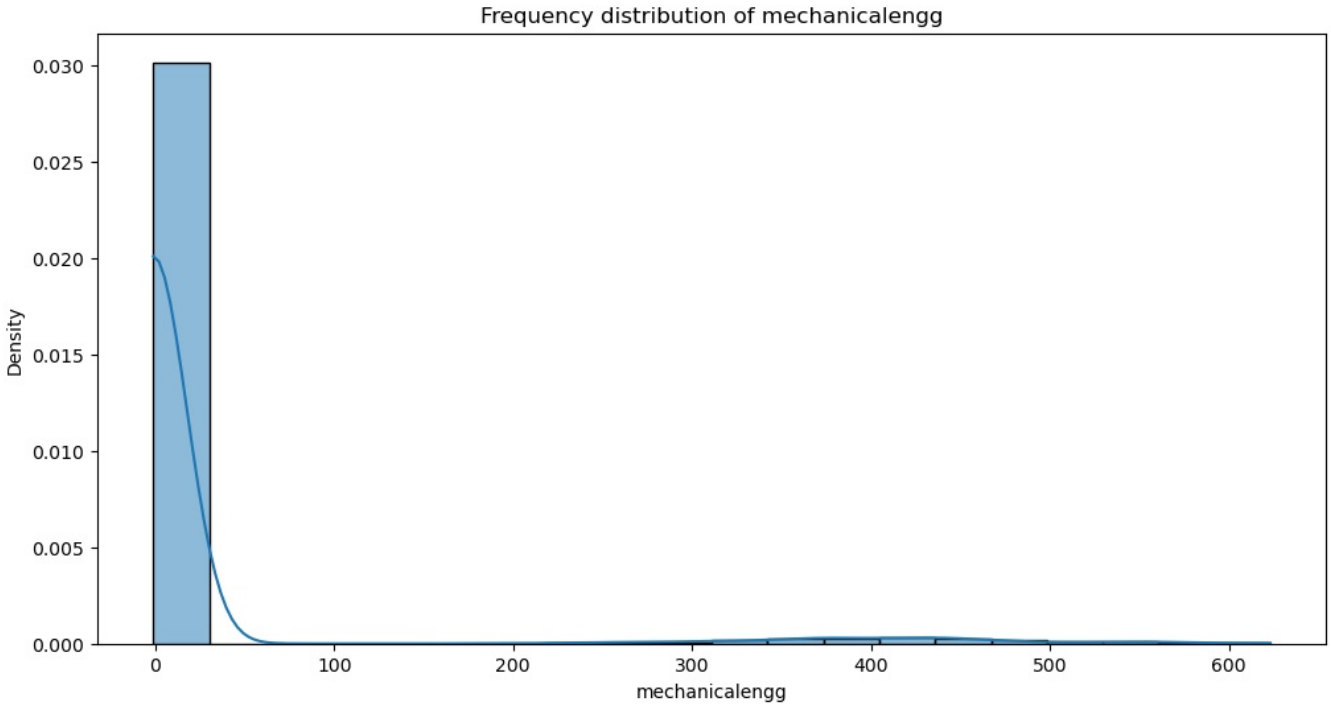
Probability distribution of computerprogramming:

```
-1      0.217109
 445    0.037769
 435    0.036018
 475    0.034767
 465    0.033517
         ...
 214    0.000250
 494    0.000250
 840    0.000250
 394    0.000250
 554    0.000250
Name: computerprogramming, Length: 79, dtype: float64
```

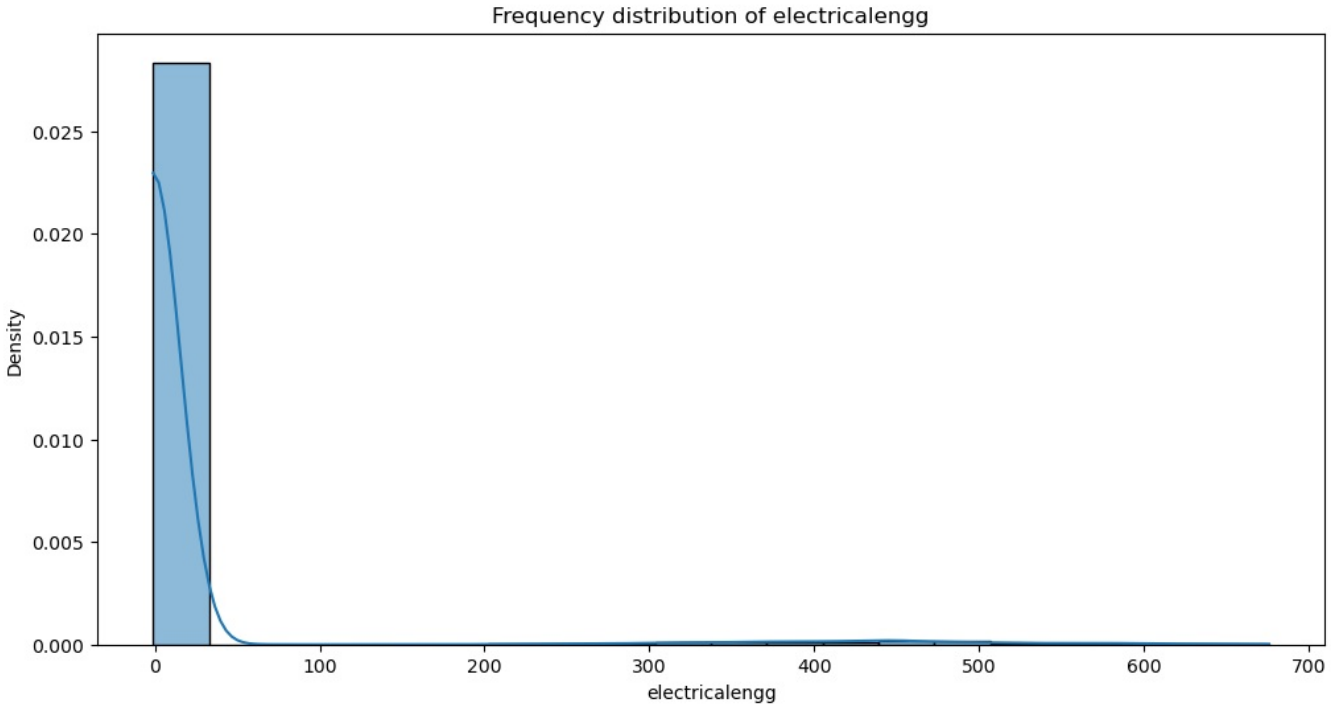


Probability distribution of computerscience:

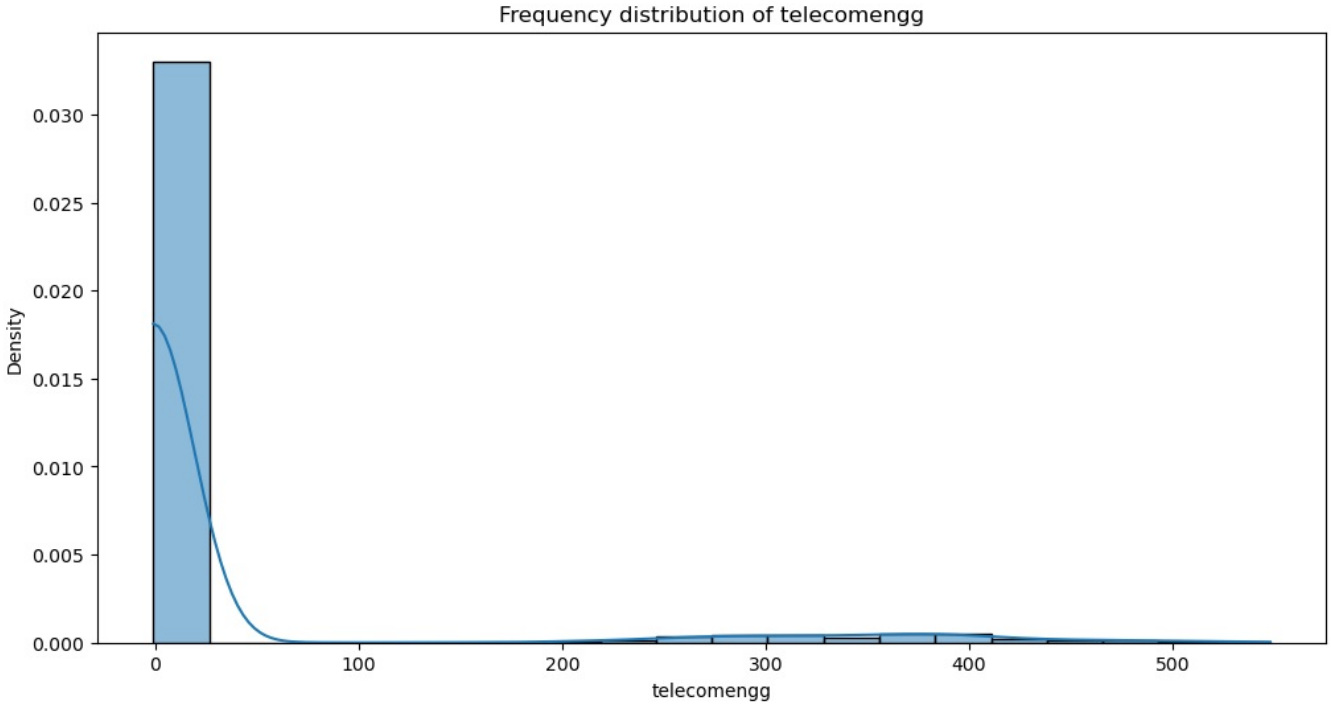
```
-1      0.774387
 407    0.032016
 376    0.030765
 346    0.029515
 438    0.027764
 469    0.020010
 315    0.019260
 500    0.016008
 284    0.012506
 530    0.011256
 253    0.007504
 561    0.005503
 223    0.003502
 592    0.003502
 623    0.002501
 653    0.002251
 192    0.000750
 715    0.000500
 684    0.000250
 130    0.000250
Name: computerscience, dtype: float64
```


Frequency distribution of mechanicalengg
Density
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0
100
200
300
400
500
600
mechanicalengg

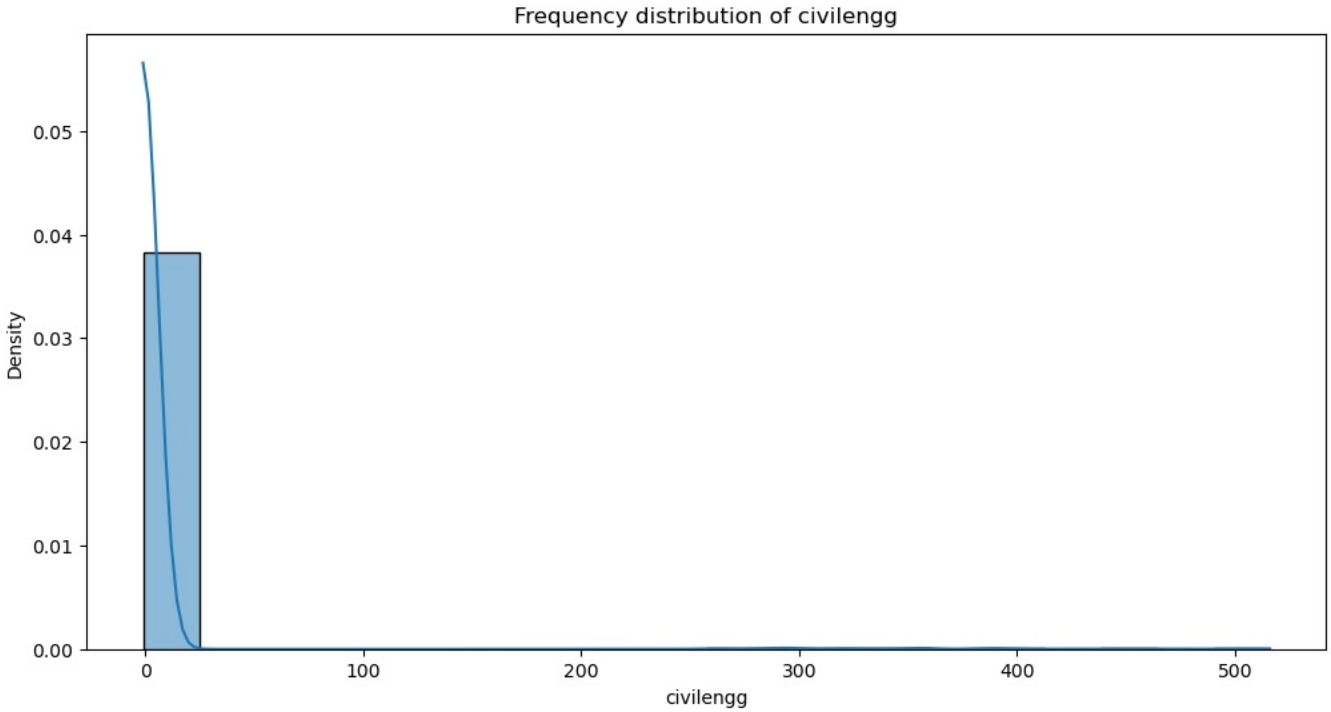
```
Probability distribution of mechanicalengg:
-1      0.941221
 366    0.005003
 446    0.004002
 438    0.003752
 420    0.003502
 376    0.003252
 313    0.003252
 393    0.003252
 407    0.003002
 346    0.002751
 469    0.002501
 473    0.002501
 553    0.002001
 435    0.001751
 383    0.001501
 340    0.001501
 526    0.001251
 409    0.001251
 286    0.001251
 500    0.001001
 253    0.001001
 284    0.000750
 332    0.000750
 538    0.000750
 254    0.000750
 580    0.000750
 616    0.000500
 564    0.000500
 606    0.000500
 223    0.000500
 512    0.000500
 561    0.000500
 260    0.000500
 358    0.000250
 280    0.000250
 315    0.000250

 233    0.000250
 306    0.000250
 461    0.000250
 180    0.000250
 206    0.000250
 623    0.000250
Name: mechanicalengg, dtype: float64
```



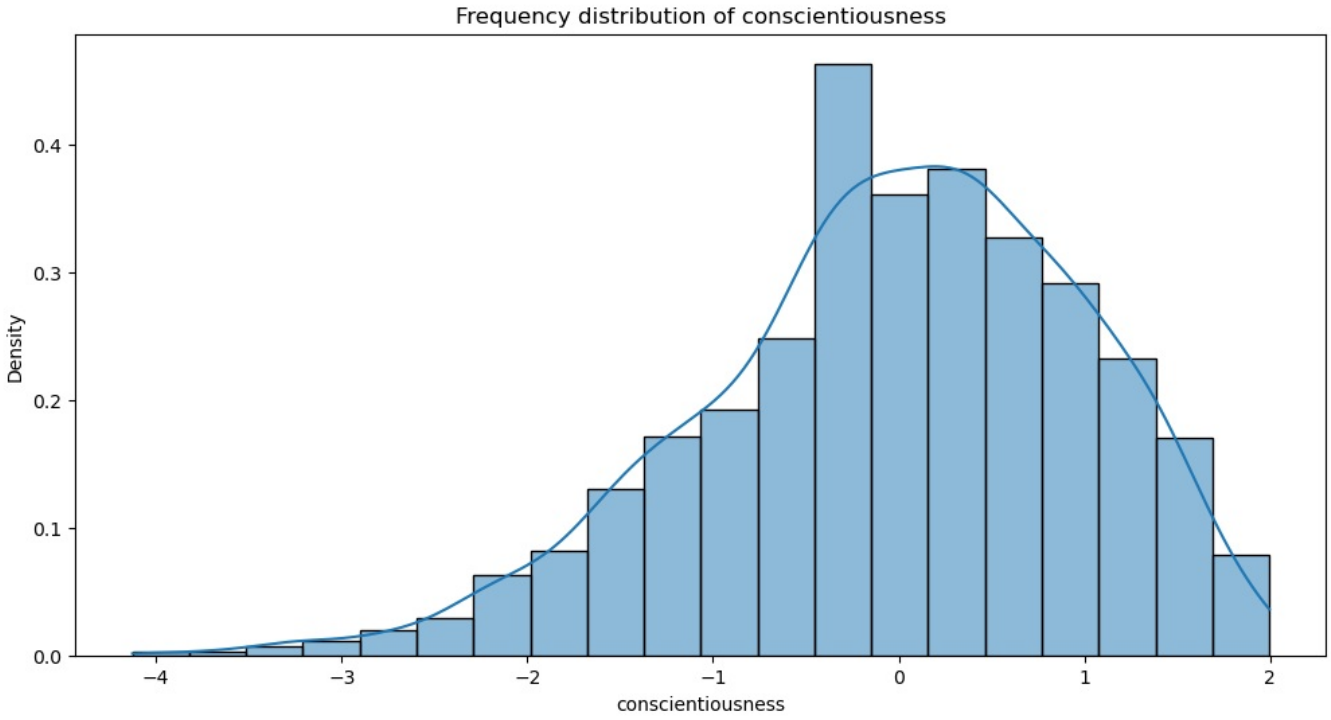
```
Probability distribution of electricalengg:
-1      0.959730
 420    0.004002
 446    0.003502
 388    0.002501
 473    0.002501
 452    0.002501
 356    0.002251
 500    0.002001
 580    0.002001
 366    0.001751
 324    0.001751
 393    0.001751

 553    0.001501
 313    0.001501
 516    0.001251
 260    0.001001
 292    0.001001
 340    0.000750
 228    0.000750
 526    0.000750
 484    0.000750
 633    0.000750
 548    0.000500
 433    0.000500
 606    0.000500
 612    0.000500
 660    0.000500
 286    0.000500
 676    0.000250
 411    0.000250
 206    0.000250
Name: electricalengg, dtype: float64
```



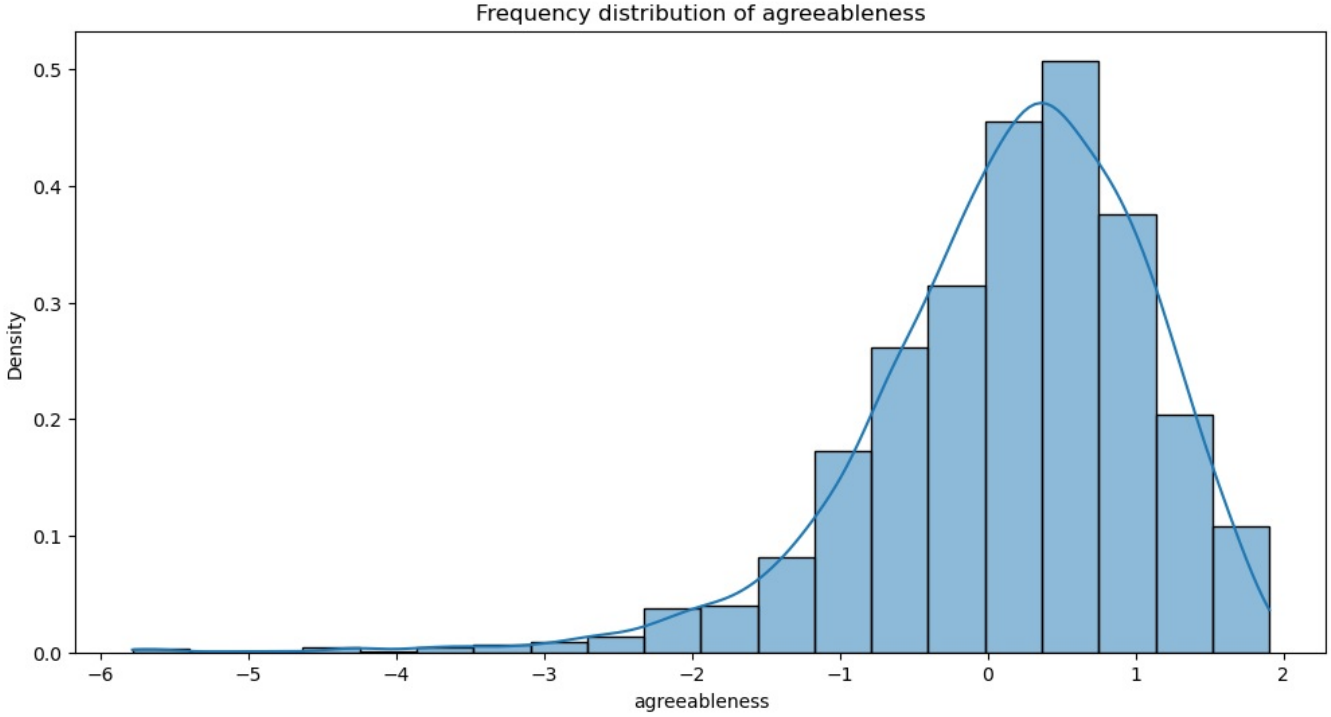
```
Probability distribution of telecomengg:
-1      0.906453
 393    0.011256
 366    0.010755
 260    0.008754
 313    0.008504
 340    0.008004
 286    0.007754
 420    0.006503
 446    0.004002
 388    0.003502
 233    0.003502
 473    0.003252
 292    0.003252
 356    0.003002
 324    0.002751
 206    0.002001
 500    0.001251
 526    0.001251
 516    0.001001
 484    0.001001
 228    0.000750
 548    0.000500
 153    0.000250

 196    0.000250
 164    0.000250
 452    0.000250
Name: telecomengg, dtype: float64
```



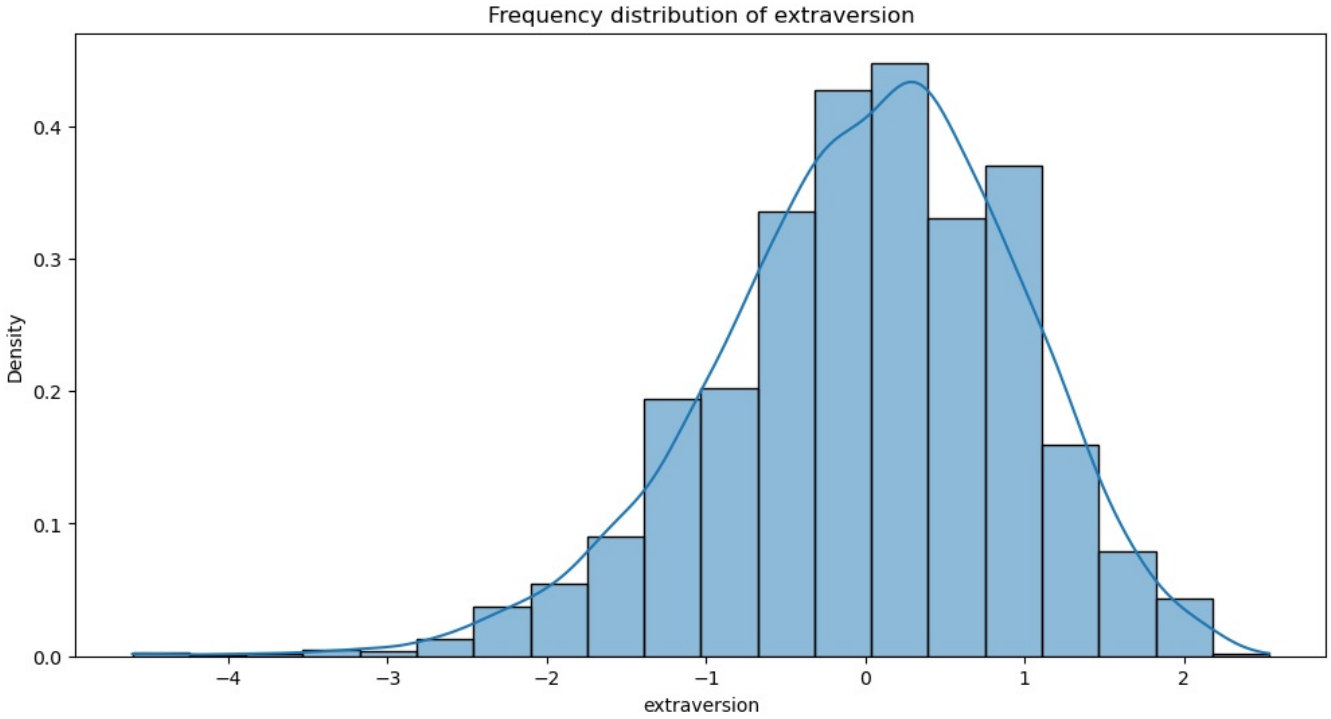

```
Probability distribution of civilengg:
-1      0.989495
 356    0.001501
 292    0.001501
 388    0.001001
 260    0.000750
 320    0.000750
 500    0.000500
 300    0.000500
 340    0.000500
 516    0.000250
 460    0.000250
 420    0.000250
 280    0.000250
 433    0.000250
 380    0.000250
 452    0.000250
 277    0.000250
 166    0.000250
 322    0.000250
 200    0.000250
 440    0.000250
 400    0.000250
 480    0.000250
Name: civilengg, dtype: float64
```



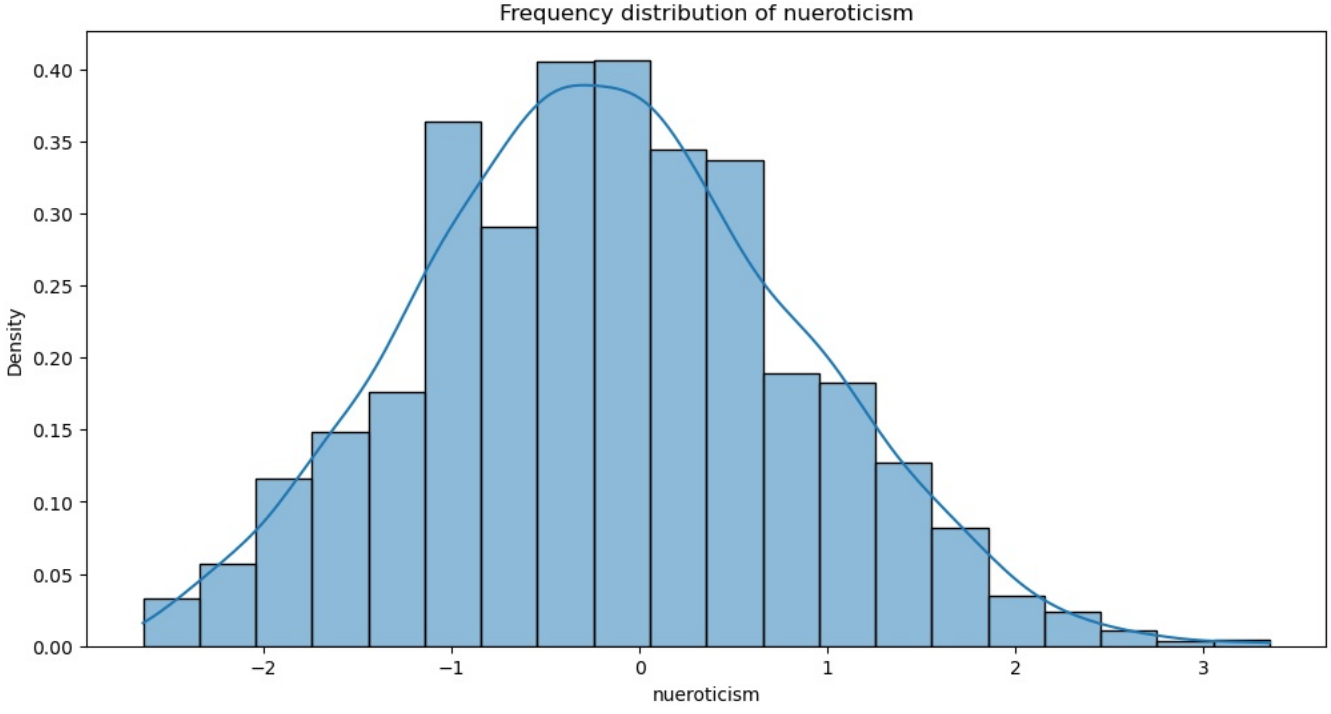

```
Probability distribution of conscientiousness:
 0.2718    0.036268
 0.1282    0.033517
-0.1590    0.033267
 0.4155    0.032766
-0.0154    0.032266
             ...
-3.4624    0.000250
-1.2950    0.000250
-0.9653    0.000250
-0.4854    0.000250
 0.8986    0.000250
Name: conscientiousness, Length: 141, dtype: float64
```



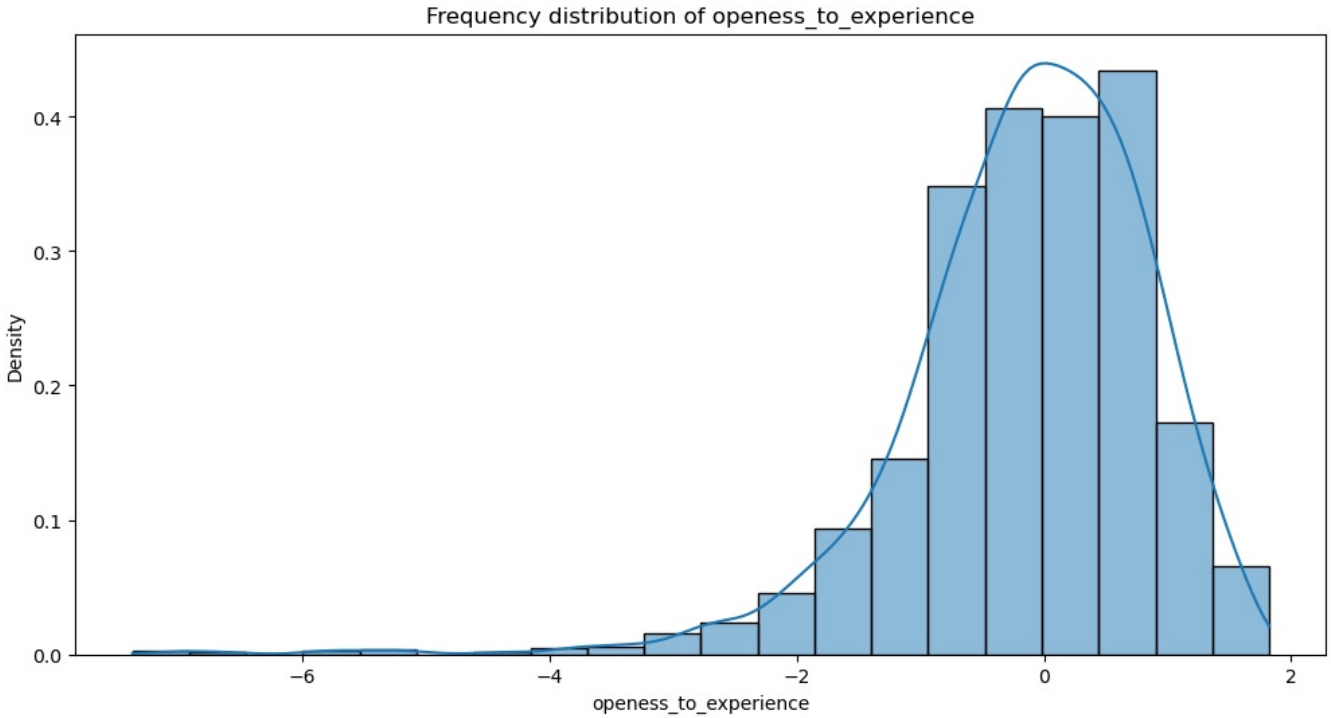
```
Probability distribution of agreeableness:
 0.3789    0.048274
 0.2124    0.045023
 0.5454    0.043772
 0.0459    0.041521
 0.8784    0.039520
             ...
-3.1264    0.000250
-3.0094    0.000250
-3.9501    0.000250
-1.7223    0.000250

-0.8320    0.000250
Name: agreeableness, Length: 149, dtype: float64
```




```
Probability distribution of extraversion:
 0.4711    0.044772
 0.3174    0.044522
 0.1637    0.038769
 0.7785    0.036518
-0.1437    0.033767
             ...
-3.5370    0.000250
-0.4226    0.000250
 1.5791    0.000250
-0.1408    0.000250
-1.2056    0.000250
Name: extraversion, Length: 154, dtype: float64
```



```
Probability distribution of nueroticism:
-0.48790    0.031516
-0.74150    0.029515
 0.01920    0.028014
-0.61470    0.027264
-0.36120    0.026513
              ...
 1.06113    0.000250
-0.74960    0.000250
 2.76500    0.000250
 1.82493    0.000250
 2.03060    0.000250
Name: nueroticism, Length: 217, dtype: float64
```




```
Probability distribution of openess_to_experience:
 0.6721    0.046773
-0.0943    0.045523
 0.0973    0.045523
 0.4805    0.044272
 0.2889    0.043522
              ...
-6.8009    0.000250
 0.1187    0.000250
-5.6860    0.000250
-1.1291    0.000250
-0.4229    0.000250
Name: openess_to_experience, Length: 142, dtype: float64
```

In [22]:
```
#Frequency distribution of each categorical Variable/Column
frequency_dis={i: df[i].value_counts() for i in cat_columns}
for i,freq in frequency_dis.items():
 print(f"Frequncy distribution for {i}:\n{freq}\n")
```

```
Frequncy distribution for column1:
train    3998
Name: column1, dtype: int64

Frequncy distribution for doj:
07-01-2014 00:00    199
06-01-2014 00:00    180
08-01-2014 00:00    178
09-01-2014 00:00    142
01-01-2014 00:00    142
                   ...
11-01-2015 00:00      1
11-01-2009 00:00      1
08-01-2004 00:00      1
09-01-2009 00:00      1
02-01-2007 00:00      1
Name: doj, Length: 81, dtype: int64

Frequncy distribution for dol:
present         1875
4/1/15 0:00      573
3/1/15 0:00      124
5/1/15 0:00      112
1/1/15 0:00       99
```

```
                ...
3/1/05 0:00        1
10/1/15 0:00       1
2/1/10 0:00        1
2/1/11 0:00        1
10/1/10 0:00       1
Name: dol, Length: 67, dtype: int64

Frequncy distribution for designation:
software engineer                    539
software developer                   265
system engineer                      205
programmer analyst                   139
systems engineer                     118
                                    ...
cad drafter                            1
noc engineer                           1
human resources intern                 1
senior quality assurance engineer      1
jr. software developer                 1
Name: designation, Length: 419, dtype: int64

Frequncy distribution for jobcity:
Bangalore           627
-1                  461
Noida               368
Hyderabad           335
Pune                290
                   ...
Tirunelvelli          1
Ernakulam             1
Nanded                1
Dharmapuri            1
Asifabadbanglore      1
Name: jobcity, Length: 339, dtype: int64

Frequncy distribution for gender:
m    3041
f     957
Name: gender, dtype: int64

Frequncy distribution for dob:
1/1/91 0:00      11
7/15/91 0:00     10
7/5/91 0:00       8
12/13/91 0:00     8
6/3/91 0:00       8
                 ..
12/30/92 0:00     1
10/20/86 0:00     1
11/17/89 0:00     1
9/30/92 0:00      1
4/15/87 0:00      1
Name: dob, Length: 1872, dtype: int64

Frequncy distribution for 10board:
cbse                          1395
state board                   1164
0                              350
icse                           281
ssc                            122
                              ...
hse,orissa                       1
national public school           1
nagpur board                     1
jharkhand academic council       1
bse,odisha                       1
Name: 10board, Length: 275, dtype: int64

Frequncy distribution for 12board:
cbse                                1400
state board                         1254
0                                    359
icse                                 129
up board                              87
                                     ...
jawahar higher secondary school         1
nagpur board                            1
bsemp                                   1
board of higher secondary orissa        1
boardofintermediate                     1
Name: 12board, Length: 340, dtype: int64

Frequncy distribution for degree:
B.Tech/B.E.      3700
MCA               243
M.Tech./M.E.       53
M.Sc. (Tech.)       2
Name: degree, dtype: int64
```

```
Frequncy distribution for specialization:
electronics and communication engineering      880
computer science & engineering                 744
information technology                         660
computer engineering                           600
computer application                           244
mechanical engineering                         201
electronics and electrical engineering         196
electronics & telecommunications               121
electrical engineering                          82
electronics & instrumentation eng               32
civil engineering                               29
electronics and instrumentation engineering     27
information science engineering                 27
instrumentation and control engineering         20
electronics engineering                         19
biotechnology                                   15
other                                           13
industrial & production engineering             10
applied electronics and instrumentation          9
chemical engineering                             9
computer science and technology                  6
telecommunication engineering                    6
mechanical and automation                        5
automobile/automotive engineering                5
instrumentation engineering                      4
mechatronics                                     4
aeronautical engineering                         3
electronics and computer engineering             3
electrical and power engineering                 2
biomedical engineering                           2
information & communication technology           2
industrial engineering                           2
computer science                                 2
metallurgical engineering                        2
power systems and automation                     1
control and instrumentation engineering          1
mechanical & production engineering              1
embedded systems technology                      1
polymer technology                               1
computer and communication engineering           1
information science                              1
internal combustion engine                       1
computer networking                              1
ceramic engineering                              1
electronics                                      1
industrial & management engineering              1
Name: specialization, dtype: int64

Frequncy distribution for collegestate:
Uttar Pradesh        915
Karnataka            370
Tamil Nadu           367
Telangana            319
Maharashtra          262
Andhra Pradesh       225
West Bengal          196
Punjab               193
Madhya Pradesh       189
Haryana              180
Rajasthan            174
Orissa               172
Delhi                162
Uttarakhand          113
Kerala                33
Jharkhand             28
Chhattisgarh          27
Gujarat               24
Himachal Pradesh      16
Bihar                 10
Jammu and Kashmir      7
Assam                  5
Union Territory        5
Sikkim                 3
Meghalaya              2
Goa                    1
Name: collegestate, dtype: int64
```

In [23]:
```
df['degree'].unique()
```

Out[23]:
```
array(['B.Tech/B.E.', 'MCA', 'M.Tech./M.E.', 'M.Sc. (Tech.)'],
      dtype=object)
```

In [24]:
```
df['degree'].nunique()
```

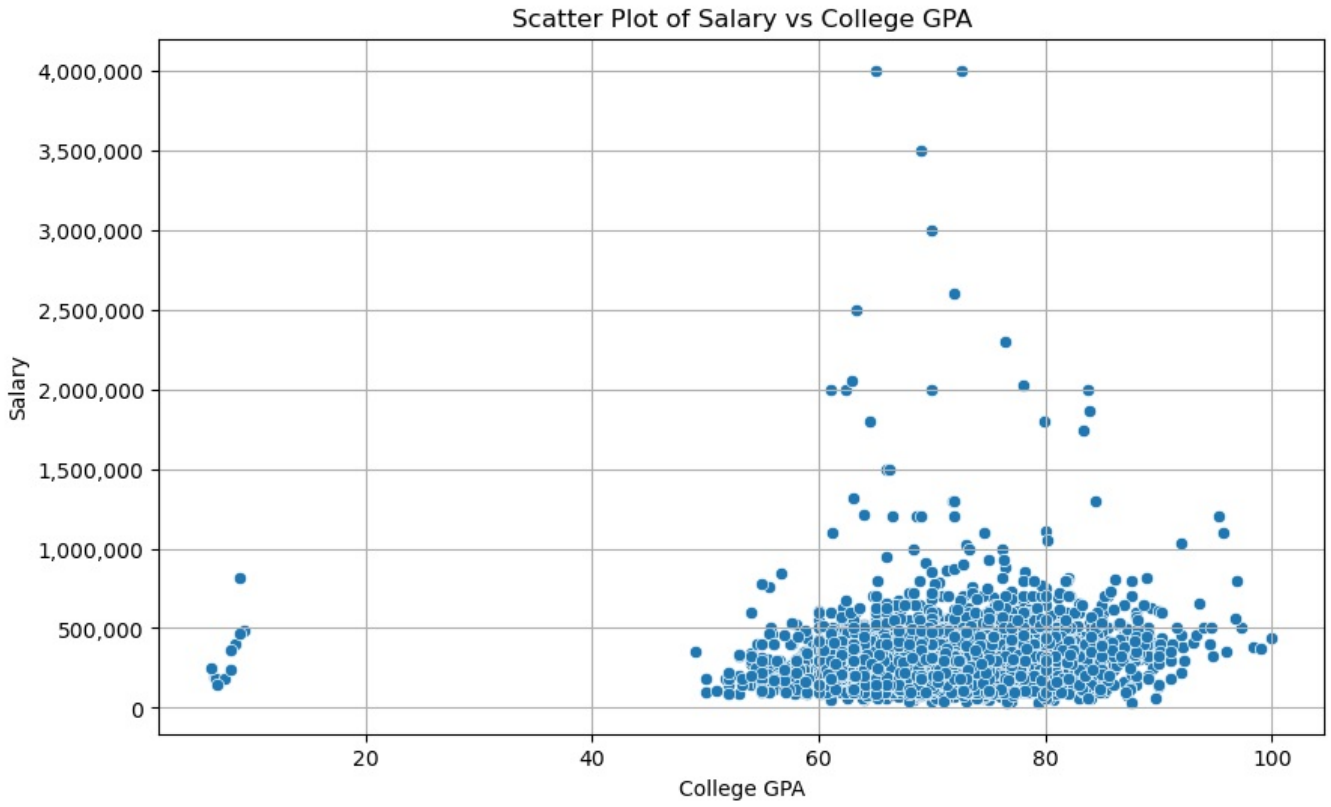
Out[24]:
```
4
```

In [25]:
```
df['jobcity'].value_counts()
```

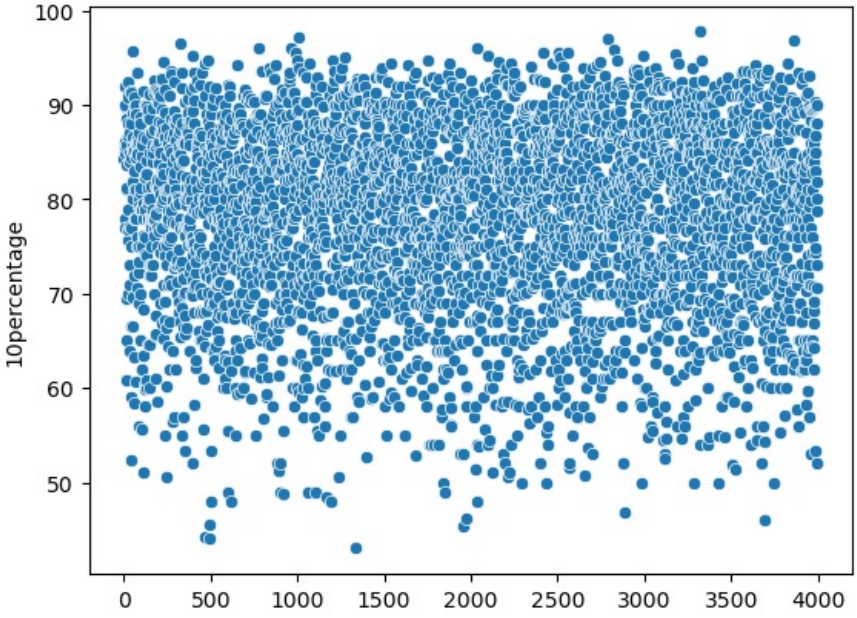
Out[25]:
```
Bangalore           627
-1                  461
Noida               368
Hyderabad           335
Pune                290
                   ...
Tirunelvelli          1
Ernakulam             1
Nanded                1
Dharmapuri            1
Asifabadbanglore      1
Name: jobcity, Length: 339, dtype: int64
```

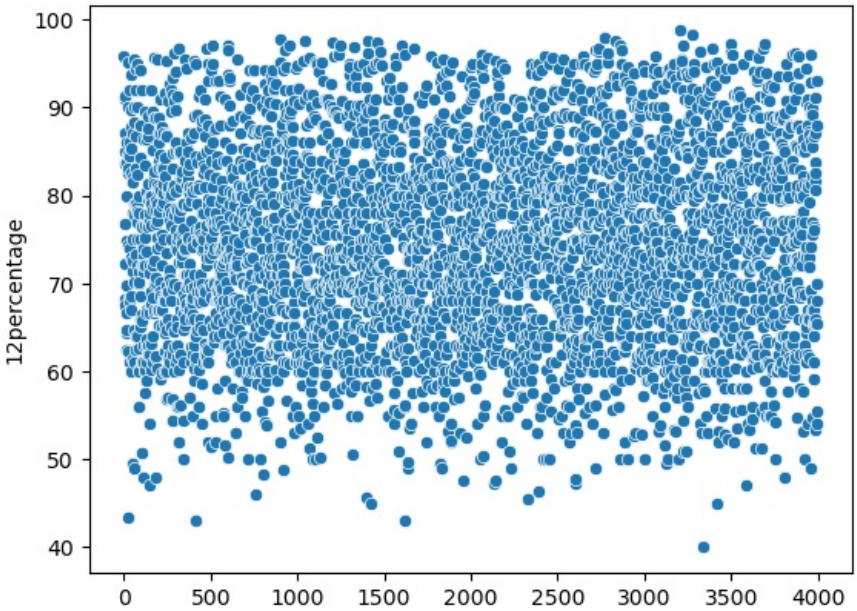
2.Bivariate Analysis

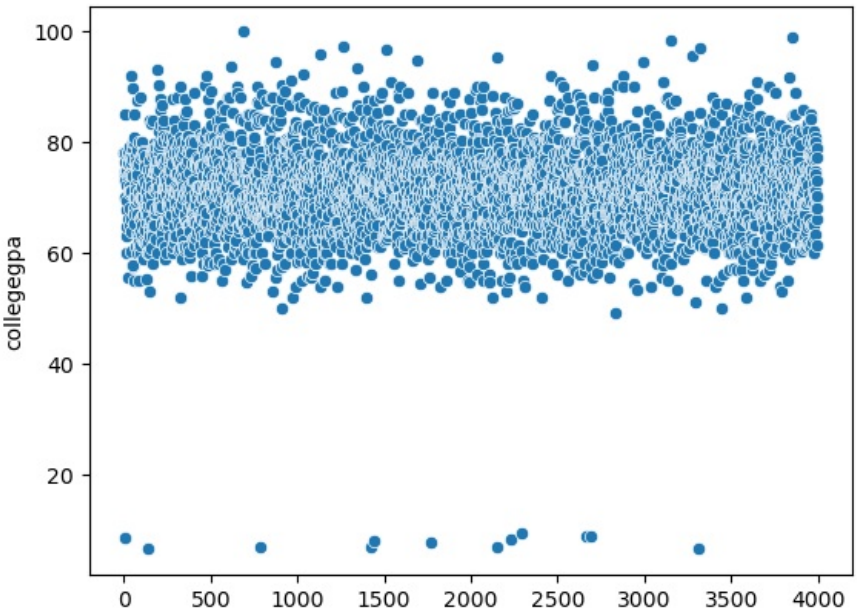
In [26]:
```
import matplotlib.pyplot as plt
import seaborn as sns
from matplotlib.ticker import FuncFormatter


def currency(x, _):
    return f'{int(x):,}'

plt.figure(figsize=(10, 6))

# Scatter plot of Salary vs College GPA
sns.scatterplot(data=df, x='collegegpa', y='salary')
plt.title('Scatter Plot of Salary vs College GPA')
plt.xlabel('College GPA')
plt.ylabel('Salary')
plt.grid(True)
plt.gca().yaxis.set_major_formatter(FuncFormatter(currency))
plt.show()
```



In [27]:
```
#Bi-Variate Analysis
for i in num_columns[1:]:
 sns.scatterplot(df[i])
 plt.show()
```


10percentage
100
90
80
70
60
50
0
500
1000
1500
2000
2500
3000
3500
4000


12percentage
100
90
80
70
60
50
40
0
500
1000
1500
2000
2500
3000
3500
4000


collegegpa
100
80
60
40
20
0
500
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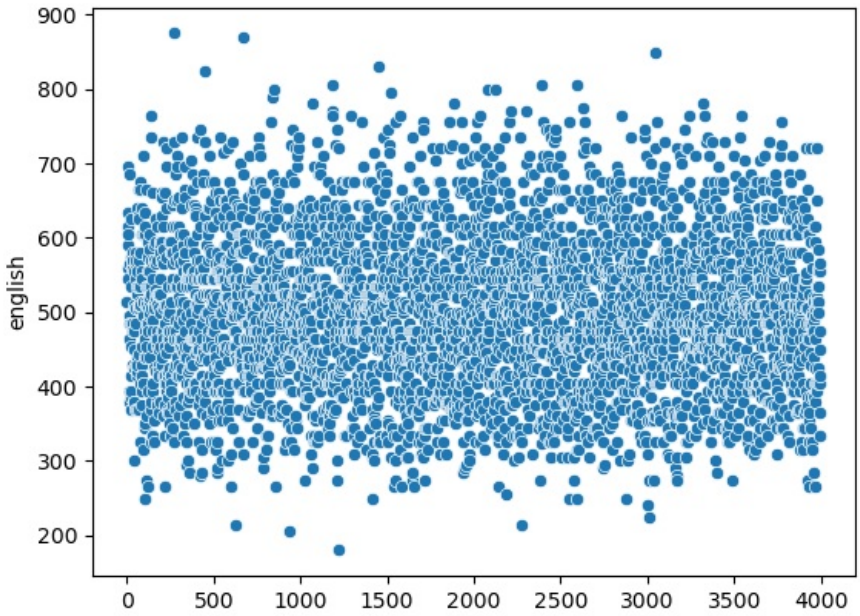
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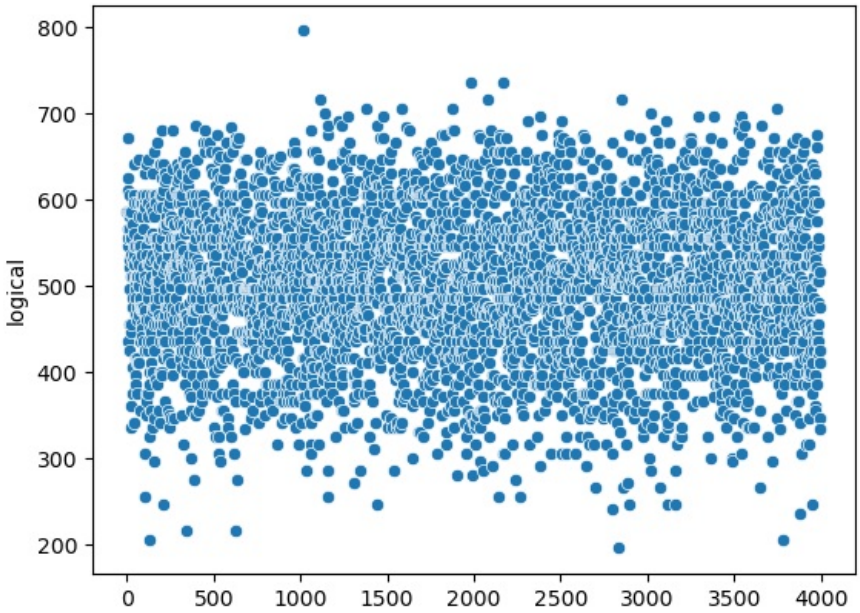
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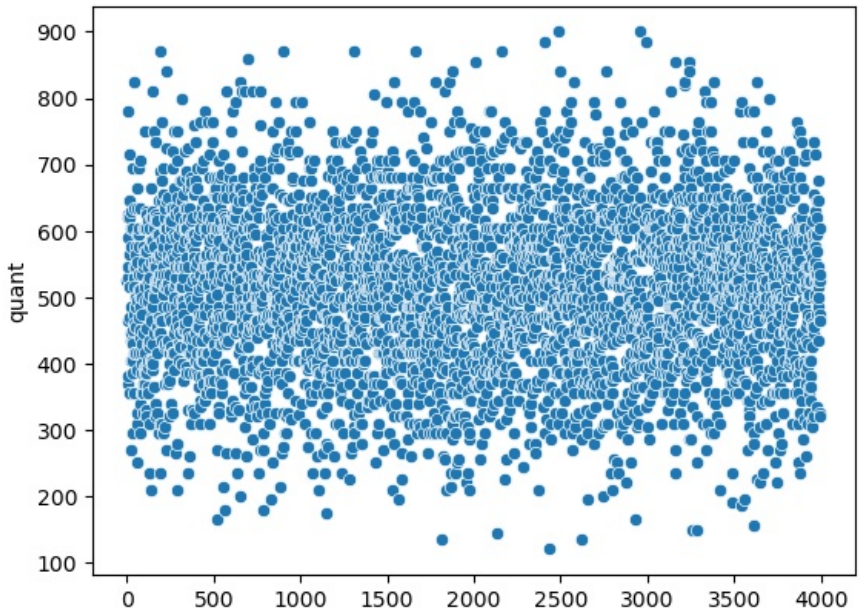
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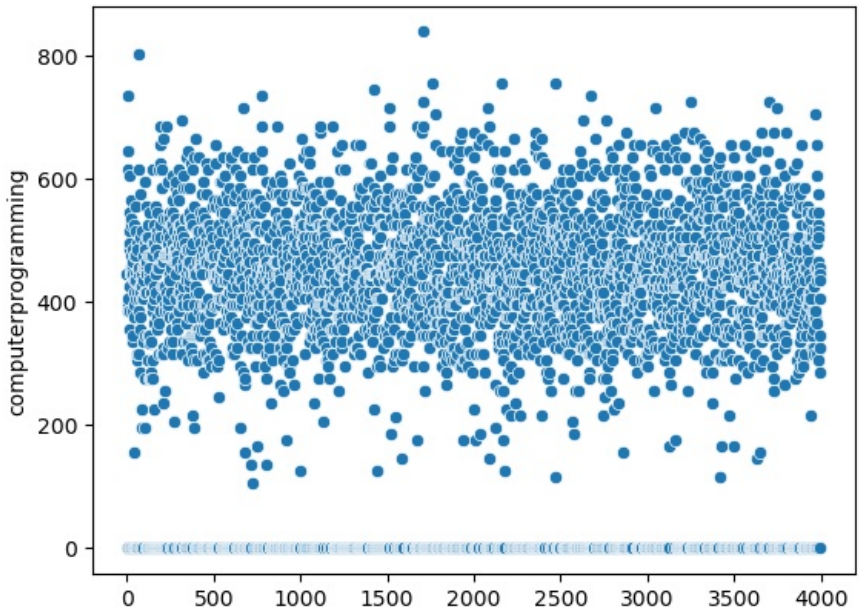
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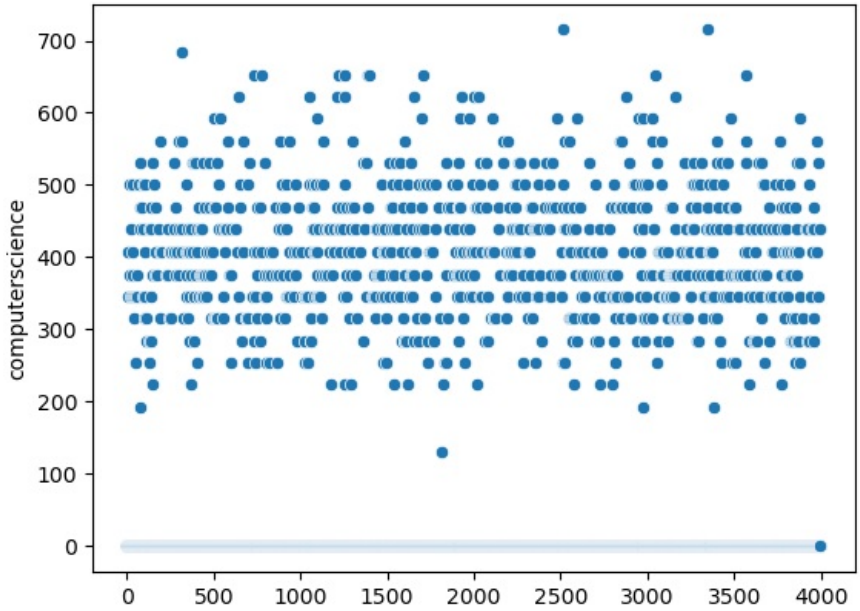
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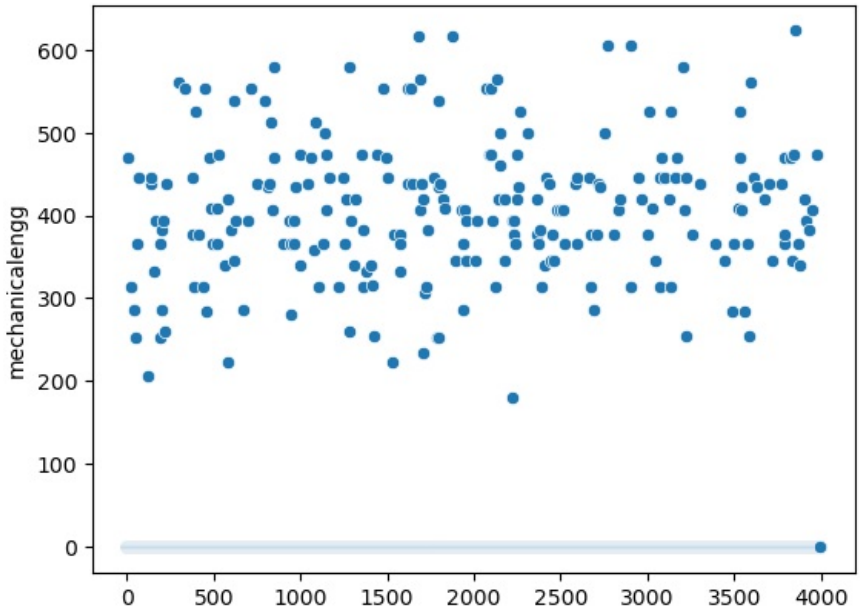
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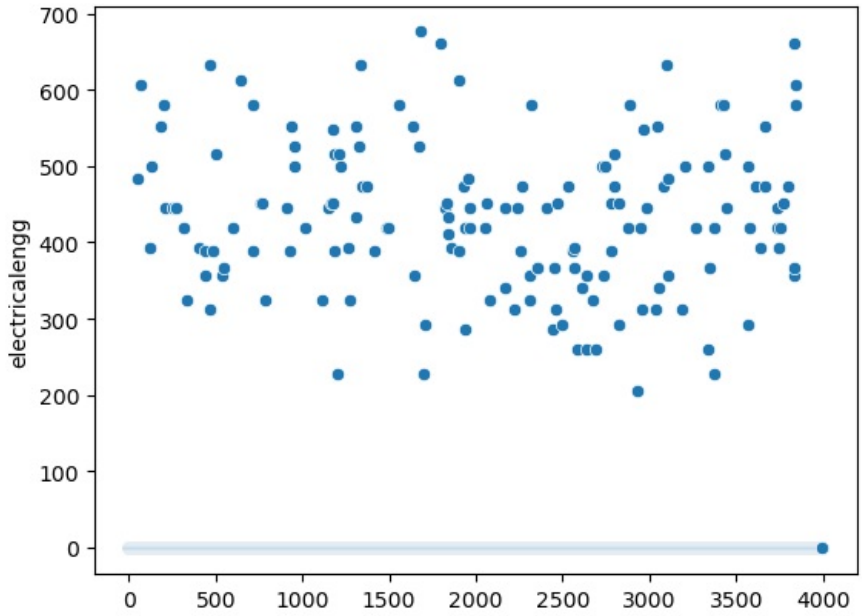
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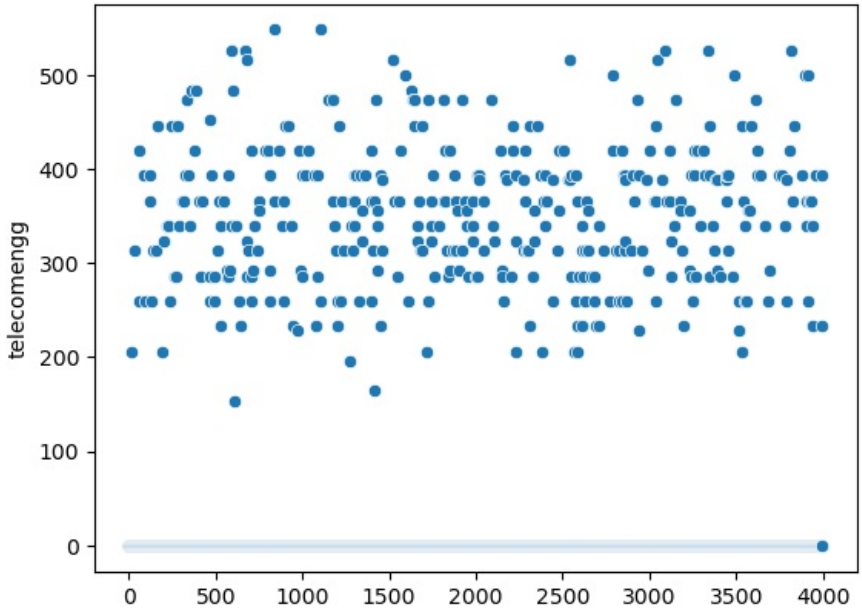
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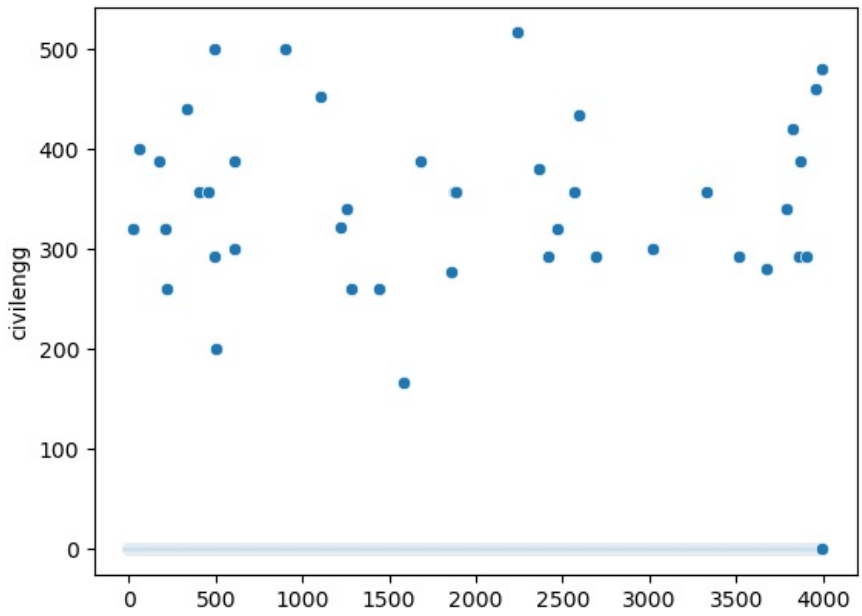
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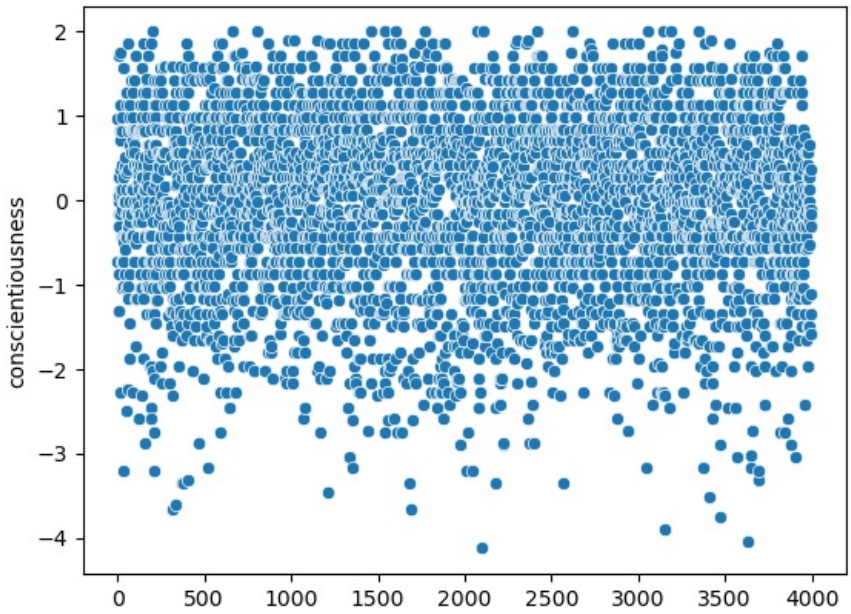
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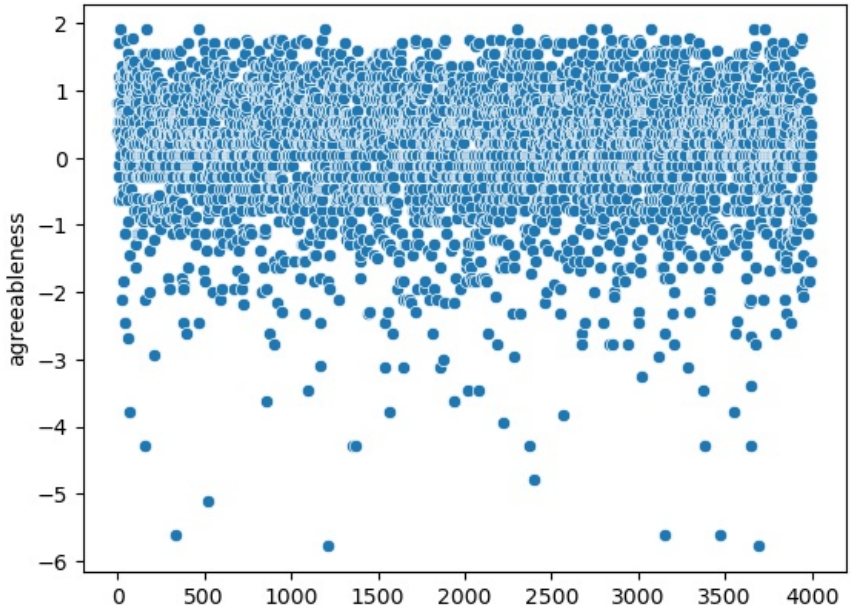
agreeableness
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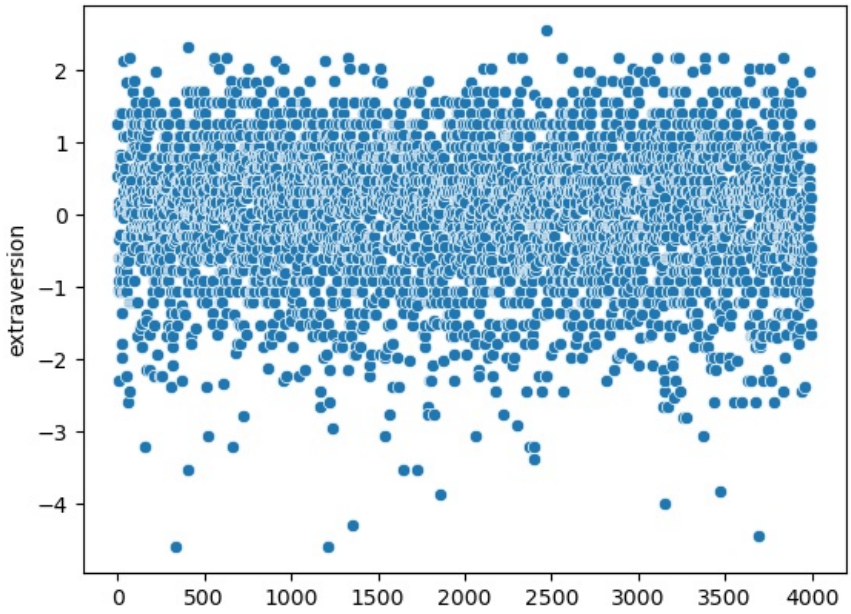
extraversion
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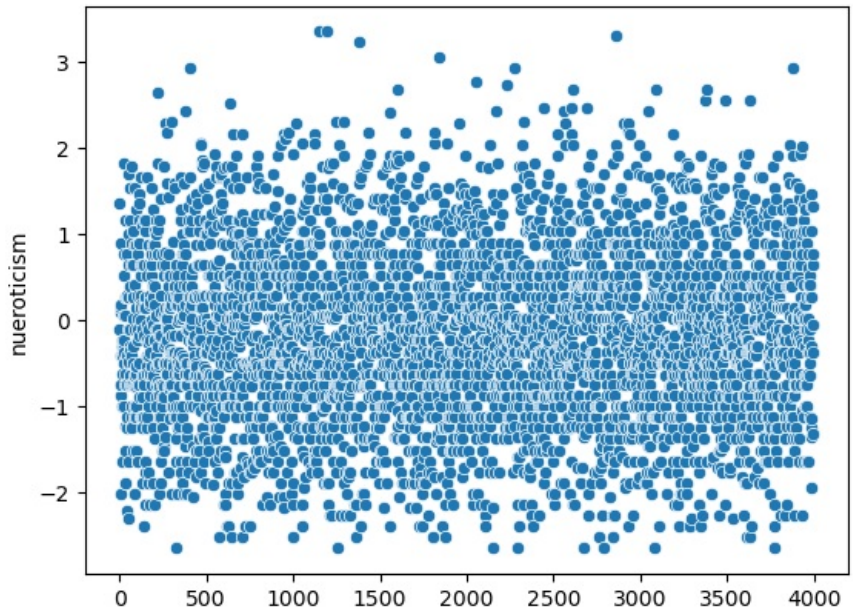
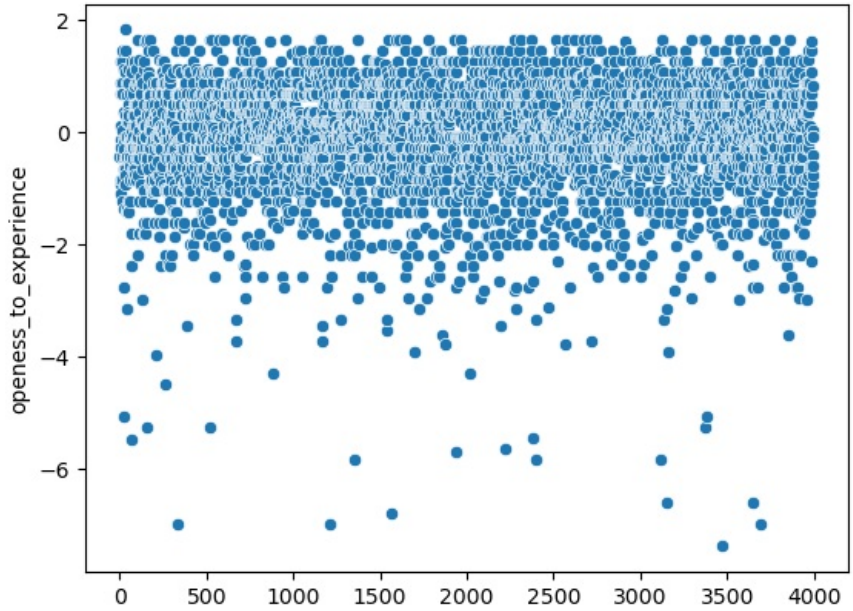
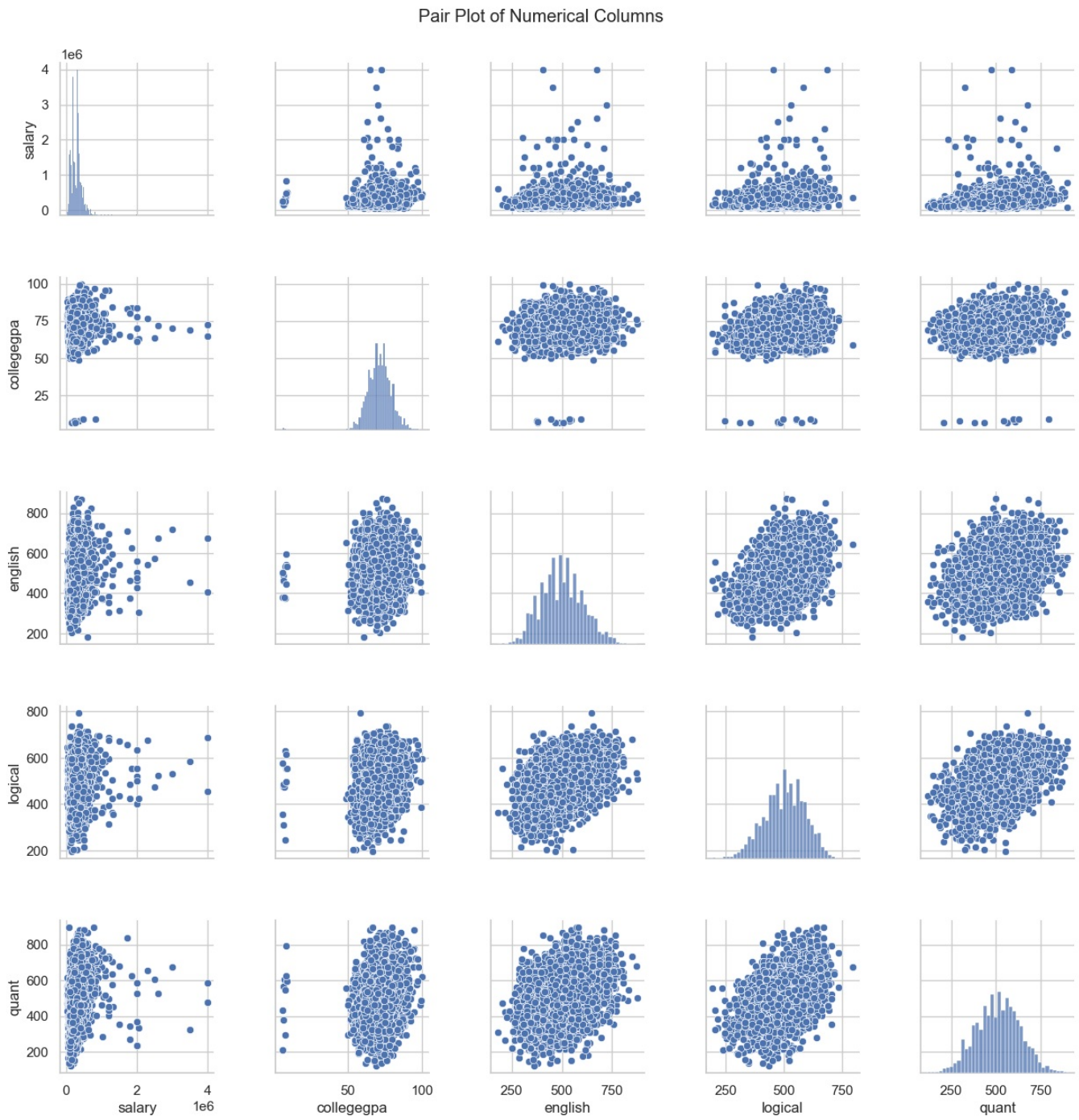




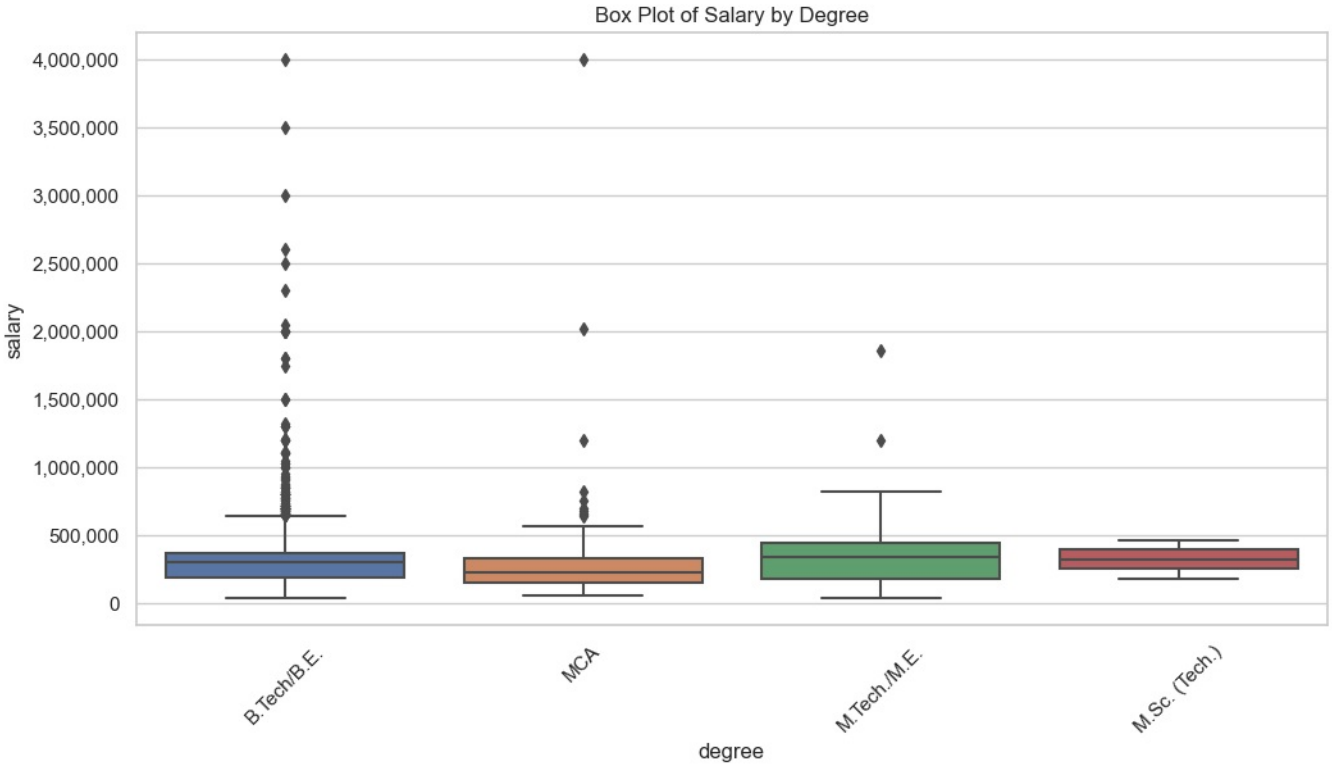
In [28]:

```
numerical_columns = ['salary', 'collegegpa', 'english', 'logical', 'quant']
sns.set(style="whitegrid")
pair_plot = sns.pairplot(df[numerical_columns])
plt.suptitle('Pair Plot of Numerical Columns', y=1.02)
plt.subplots_adjust(hspace=0.4, wspace=0.4)
plt.gca().yaxis.set_major_formatter(FuncFormatter(currency))
plt.show()
```

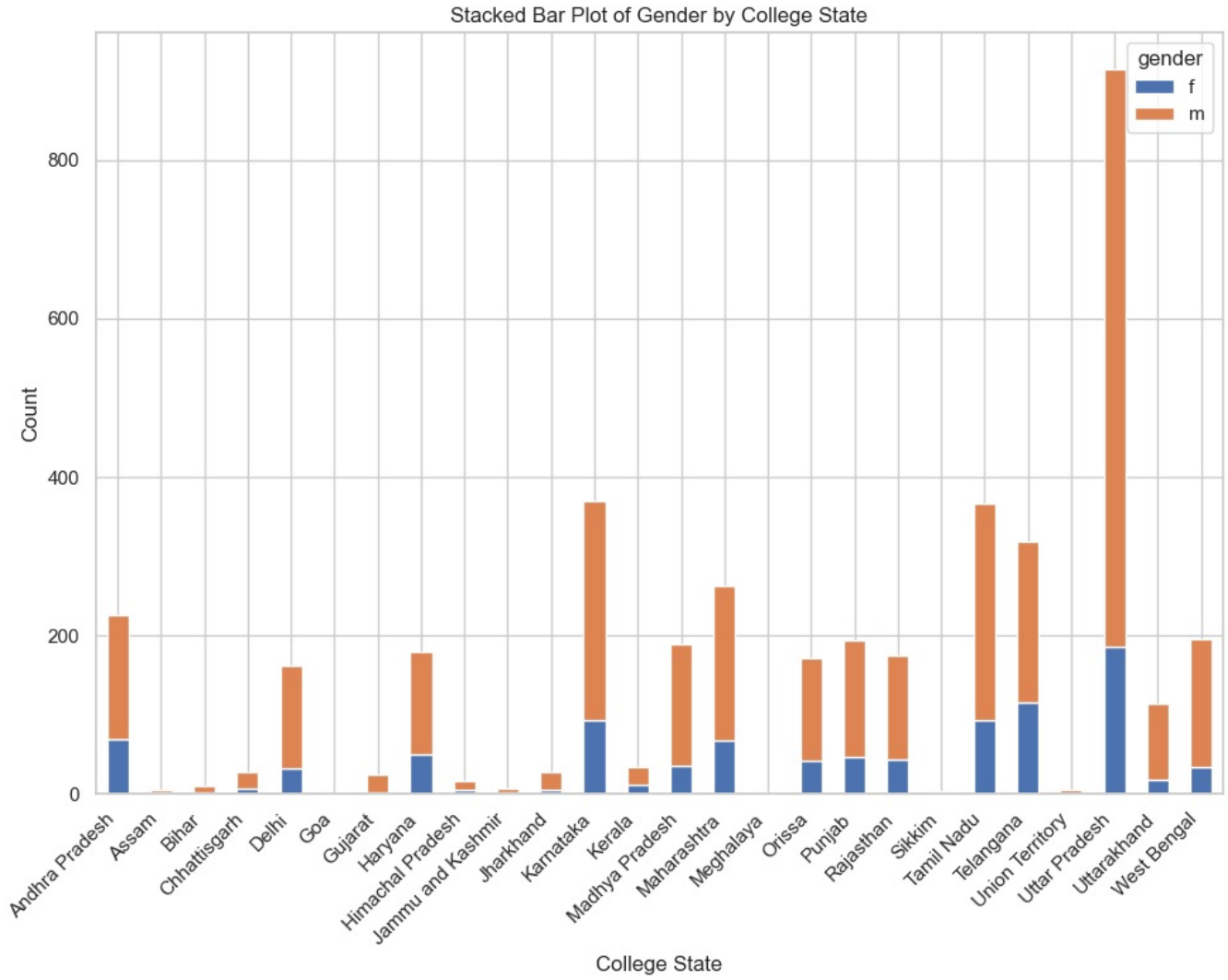


In [29]:

```
plt.figure(figsize=(12, 6))
sns.boxplot(data=df, x='degree', y='salary')
plt.title('Box Plot of Salary by Degree')
plt.xticks(rotation=45)
plt.gca().yaxis.set_major_formatter(FuncFormatter(currency))
plt.show()
```



In [30]:
```
pivot_table = df.pivot_table(index='collegestate', columns='gender',values='salary', aggfunc='count').fillna(0
pivot_table.plot(kind='bar', stacked=True, figsize=(10, 8))
plt.title('Stacked Bar Plot of Gender by College State')
plt.xlabel('College State')
plt.ylabel('Count')
plt.xticks(rotation=45, ha='right') # Adjusted alignment to 'right'
plt.tight_layout() # Adjust layout to prevent clipping
plt.show()
```



In [31]:
```
#gpa across different features
g1=df.groupby("specialization")[["collegegpa"]].mean().sort_values(by="collegegpa",ascending=False)
```

```
g1
```

Out[31]:

specialization	collegegpa
embedded systems technology	88.000000
control and instrumentation engineering	82.100000
information science	81.200000
internal combustion engine	80.600000
industrial & management engineering	80.000000
computer science	77.385000
computer and communication engineering	77.260000
power systems and automation	76.000000
other	75.619231
metallurgical engineering	75.550000
information & communication technology	75.500000
instrumentation and control engineering	75.380000
telecommunication engineering	74.776667
mechatronics	74.375000
industrial engineering	73.850000
computer application	73.700779
mechanical and automation	73.530000
biotechnology	73.155333
industrial & production engineering	73.146000
electrical engineering	72.820000
polymer technology	72.790000
civil engineering	72.761034
automobile/automotive engineering	72.690000
electronics & instrumentation eng	72.679063
electronics and communication engineering	72.126170
electronics and electrical engineering	72.097143
ceramic engineering	72.000000
applied electronics and instrumentation	71.888889
computer science & engineering	71.779798
electronics and instrumentation engineering	71.634815
computer engineering	71.046500
electronics	71.000000
information technology	70.510803
chemical engineering	70.138889
computer networking	70.130000
mechanical engineering	70.109154
computer science and technology	69.091667
electronics & telecommunications	69.020413
aeronautical engineering	68.033333
instrumentation engineering	67.547500
information science engineering	67.322593
electronics and computer engineering	67.313333
biomedical engineering	64.650000
electronics engineering	61.318947
mechanical & production engineering	58.000000
electrical and power engineering	35.705000

In [32]:

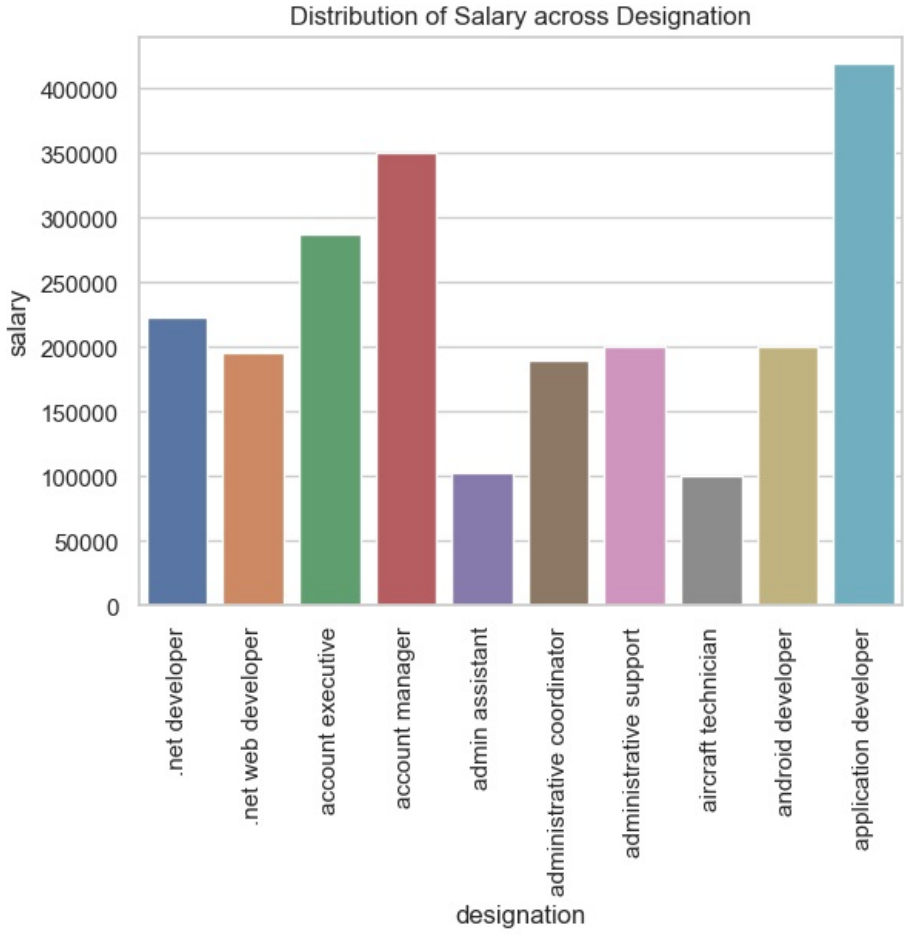
```
#Does designation affect salary
inc=df.groupby("designation")[["salary"]].mean()
inc
```

Out[32]:

designation	salary
.net developer	223382.352941
.net web developer	196250.000000
account executive	287500.000000
account manager	350000.000000
admin assistant	102500.000000
...	...
web designer and seo	200000.000000
web developer	168981.481481
web intern	205000.000000
website developer/tester	200000.000000
windows systems administrator	200000.000000

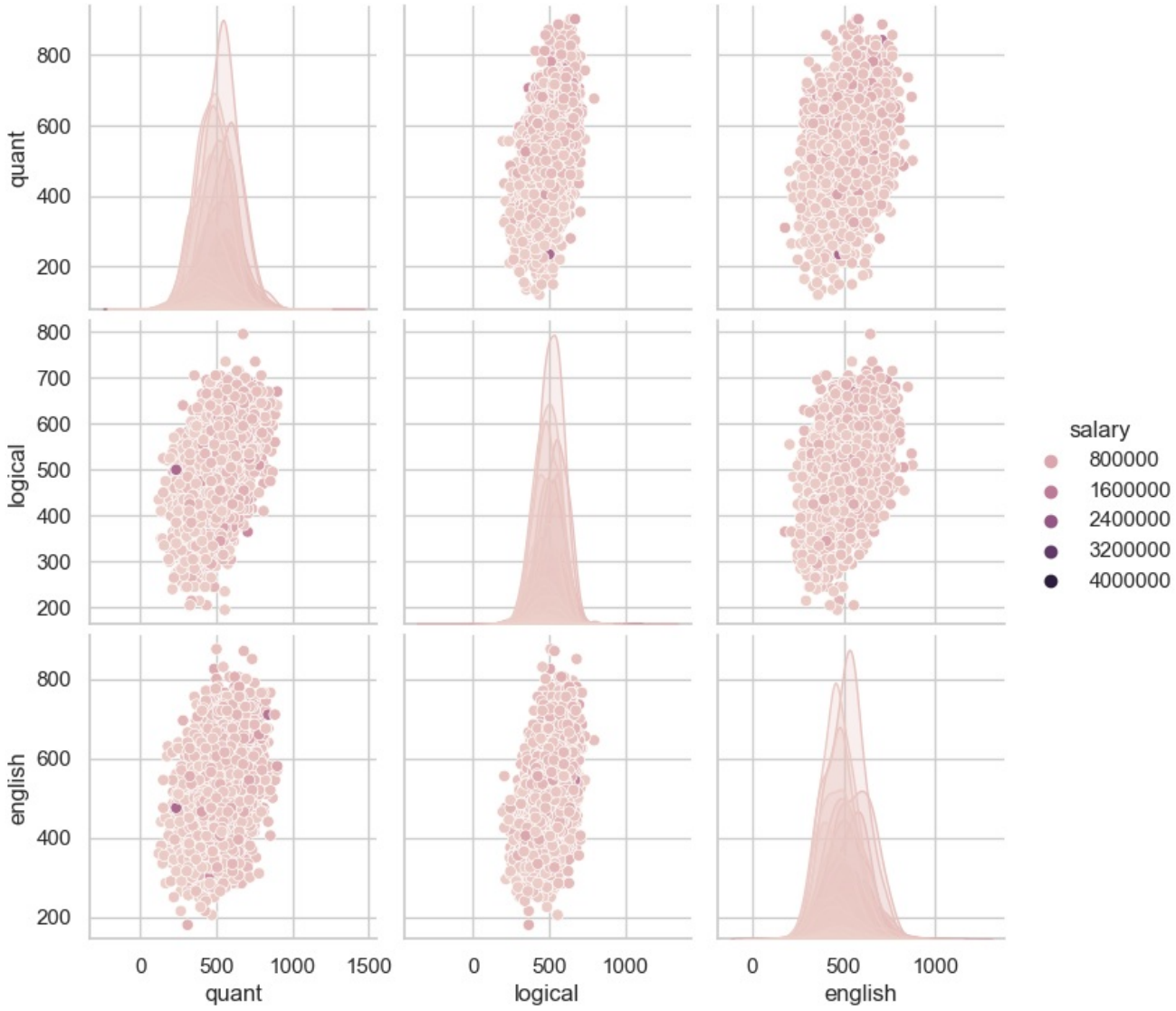
419 rows × 1 columns

In [33]:
```
# Create the bar plot for the top 10 designations based on salary
sns.barplot(x=inc.index[:10], y=inc["salary"][:10])

# Rotate the x-axis labels for better readability
plt.xticks(rotation=90)

# Set the title
plt.title("Distribution of Salary across Designation")

# Show the plot
plt.show()
```

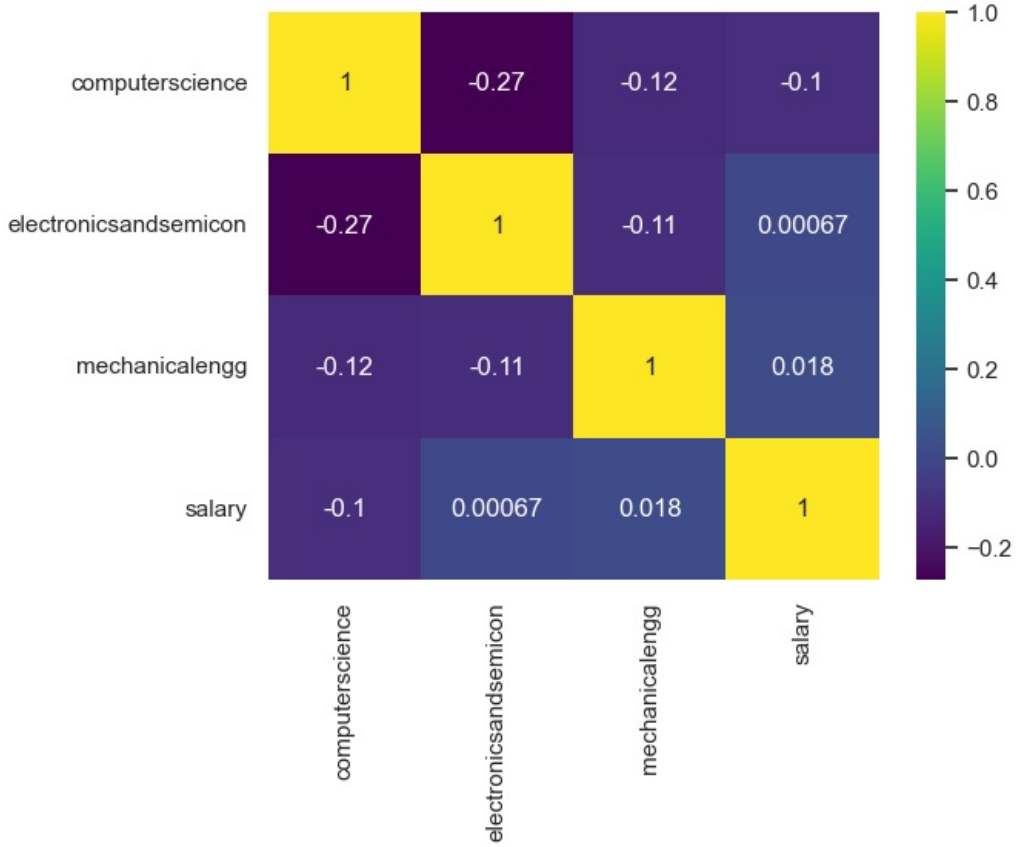


Multivariate Analysis

In [34]:
```
#how does language affect salary
sns.pairplot(df, vars=['quant', 'logical', 'english'], hue='salary')
plt.show()
```



In [38]:
```
# Specialization affecting salaries
df[['computerscience', 'electronicsandsemicon', 'mechanicalengg', 'salary']].corr()
sns.heatmap(df[['computerscience', 'electronicsandsemicon', 'mechanicalengg','salary']].corr(),annot=True,cmap=
plt.show()
```



Chi2&ttest

In [36]:
```
import pandas as pd
from scipy.stats import chi2_contingency

# Create a contingency table
contingency_table = pd.crosstab(df['designation'], df['jobcity'])

# Perform the Chi-Square test
chi2_stat, p_val, dof, expected = chi2_contingency(contingency_table)

print(f"Chi-Square Statistic: {chi2_stat}")
print(f"P-Value: {p_val}")

if p_val < 0.05:
    print("There is a significant association between Designation and Job City.")
else:
    print("There is no significant association between Designation and Job City.")
```

```
Chi-Square Statistic: 218968.308460868
P-Value: 0.0
There is a significant association between Designation and Job City.
```

In [37]:
```
from scipy.stats import ttest_ind

# Filter the data for two different designations
designation_1 = df[df['designation'] == 'Designation_1']['salary']
designation_2 = df[df['designation'] == 'Designation_2']['salary']

# Perform an independent T-test
t_stat, p_val = ttest_ind(designation_1, designation_2)

print(f"T-Statistic: {t_stat}")
print(f"P-Value: {p_val}")

if p_val < 0.05:
    print("The difference in salary between the two designations is statistically significant.")
else:
    print("There is no significant difference in salary between the two designations.")
```

```
T-Statistic: nan
P-Value: nan
There is no significant difference in salary between the two designations.
```