```python
import numpy as np
import pandas as pd

df=pd.read_csv('dete_survey.csv',na_values="Not Stated")

pd.options.display.max_columns=150

df.head()
```

```
   ID                   SeparationType Cease Date  DETE Start Date  \
0   1            Ill Health Retirement    08/2012           1984.0
1   2  Voluntary Early Retirement (VER)   08/2012              NaN
2   3  Voluntary Early Retirement (VER)   05/2012           2011.0
3   4          Resignation-Other reasons  05/2012           2005.0
4   5                   Age Retirement    05/2012           1970.0

   Role Start Date                               Position  \
0          2004.0                          Public Servant
1             NaN                          Public Servant
2          2011.0                          Schools Officer
3          2006.0                                  Teacher
4          1989.0  Head of Curriculum/Head of Special Education

  Classification              Region                        Business
Unit  \
0       A01-A04       Central Office  Corporate Strategy and
Peformance
1       A05-A07       Central Office  Corporate Strategy and
Peformance
2           NaN       Central Office                      Education
Queensland
3       Primary  Central Queensland
NaN
4           NaN           South East
NaN

     Employment Status  Career move to public sector  \
0  Permanent Full-time                          True
1  Permanent Full-time                         False
2  Permanent Full-time                         False
3  Permanent Full-time                         False
4  Permanent Full-time                         False

   Career move to private sector  Interpersonal conflicts  \
0                          False                    False
1                          False                    False
2                          False                    False
3                           True                    False
4                          False                    False

   Job dissatisfaction  Dissatisfaction with the department  \
```

```
0                  True                                  False
1                 False                                  False
2                 False                                  False
3                 False                                  False
4                 False                                  False

   Physical work environment  Lack of recognition  Lack of job
security  \
0                     False                 True
False
1                     False                False
False
2                     False                False
False
3                     False                False
False
4                     False                False
False

   Work location  Employment conditions  Maternity/family  Relocation
\
0          False                  False             False       False

1          False                  False             False       False

2          False                  False             False       False

3          False                  False             False       False

4          False                  False             False       False


   Study/Travel  Ill Health  Traumatic incident  Work life balance
Workload  \
0         False       False               False              False
False
1         False       False               False              False
False
2         False       False               False              False
False
3         False       False               False              False
False
4         False       False               False               True
False

   None of the above Professional Development Opportunities for
promotion  \
0               True                          A
A
1              False                          A
```

```
    A
2            True                            N
N
3            False                           A
N
4            False                           A
A

   Staff morale Workplace issue Physical environment Worklife
balance  \
0              N               N                     N                 A

1              N               N                     N                 N

2              N               N                     N                 N

3              N               N                     A                 A

4              N               N                     D                 D


   Stress and pressure support Performance of supervisor Peer
support  \
0                             A                          A              A

1                             A                          A              A

2                             N                          N              N

3                             N                          N              A

4                             N                          A              A


   Initiative Skills Coach Career Aspirations Feedback Further PD  \
0           N      N     N                   A        A          A
1           N      N     N                   A        A          A
2           N      N     N                   N        N          N
3           A      A     A                   A        A          A
4           A      A     A                   A       SA         SA

   Communication My say Information Kept informed Wellness programs  \
0              N      A           A             N                 N
1              N      A           A             N                 N
2              A      A           N             N                 N
3              A      A           A             A                 N
4              D      D           A             N                 A

   Health & Safety  Gender        Age Aboriginal Torres Strait South
Sea  \
0                N    Male      56-60        NaN              NaN
```

```
NaN
1                  N    Male       56-60           NaN            NaN
NaN
2                  N    Male  61 or older          NaN            NaN
NaN
3                  A  Female       36-40           NaN            NaN
NaN
4                  M  Female  61 or older          NaN            NaN
NaN

  Disability NESB
0        NaN  Yes
1        NaN  NaN
2        NaN  NaN
3        NaN  NaN
4        NaN  NaN
```

```python
tafe_survey = pd.read_csv('tafe_survey.csv', encoding ='cp1252')
tafe_survey.head()
```

```
      Record ID                            Institute  \
0  6.341330e+17  Southern Queensland Institute of TAFE
1  6.341337e+17            Mount Isa Institute of TAFE
2  6.341388e+17            Mount Isa Institute of TAFE
3  6.341399e+17            Mount Isa Institute of TAFE
4  6.341466e+17  Southern Queensland Institute of TAFE

                 WorkArea   CESSATION YEAR Reason for ceasing
employment  \
0  Non-Delivery (corporate)          2010.0              Contract
Expired
1  Non-Delivery (corporate)          2010.0
Retirement
2       Delivery (teaching)          2010.0
Retirement
3  Non-Delivery (corporate)          2010.0
Resignation
4       Delivery (teaching)          2010.0
Resignation

  Contributing Factors. Career Move - Public Sector   \
0                                              NaN
1                                                -
2                                                -
3                                                -
4                                                -

  Contributing Factors. Career Move - Private Sector   \
0                                              NaN
1                                                -
```

```
2                                                                    -
3                                                                    -
4                                 Career Move - Private Sector

   Contributing Factors. Career Move - Self-employment  \
0                                                       NaN
1                                                         -
2                                                         -
3                                                         -
4                                                         -

   Contributing Factors. Ill Health Contributing Factors.
Maternity/Family  \
0                                  NaN
NaN
1                                    -
-
2                                    -
-
3                                    -
-
4                                    -
-

  Contributing Factors. Dissatisfaction  \
0                                     NaN
1                                       -
2                                       -
3                                       -
4                                       -

  Contributing Factors. Job Dissatisfaction  \
0                                         NaN
1                                           -
2                                           -
3                                           -
4                                           -

   Contributing Factors. Interpersonal Conflict Contributing Factors.
Study  \
0                                           NaN
NaN
1                                             -
-
2                                             -
-
3                                             -
-
4                                             -
-
```

```
   Contributing Factors. Travel Contributing Factors. Other  \
0                            NaN                          NaN
1                         Travel                            -
2                              -                            -
3                         Travel                            -
4                              -                            -

   Contributing Factors. NONE  \
0                          NaN
1                            -
2                         NONE
3                            -
4                            -

   Main Factor. Which of these was the main factor for leaving?  \
0                                                NaN
1                                                NaN
2                                                NaN
3                                                NaN
4                                                NaN

   InstituteViews. Topic:1. I feel the senior leadership had a clear
vision and direction  \
0                                                Agree

1                                                Agree

2                                                Agree

3                                                Agree

4                                                Agree


   InstituteViews. Topic:2. I was given access to skills training to
help me do my job better  \
0                                                Agree

1                                                Agree

2                                                Agree

3                                                Agree

4                                                Agree


   InstituteViews. Topic:3. I was given adequate opportunities for
personal development  \
0                                                Agree
```

```
1                                           Agree

2                                           Agree

3                                           Agree

4                                  Strongly Agree


  InstituteViews. Topic:4. I was given adequate opportunities for
promotion within %Institute]Q25LBL%  \
0                                         Neutral

1                                           Agree

2                                           Agree

3                                           Agree

4                                           Agree


  InstituteViews. Topic:5. I felt the salary for the job was right for
the responsibilities I had  \
0                                           Agree

1                                           Agree

2                                           Agree

3                                           Agree

4                                  Strongly Agree


  InstituteViews. Topic:6. The organisation recognised when staff did
good work  \
0                                           Agree

1                                  Strongly Agree

2                                           Agree

3                                           Agree

4                                  Strongly Agree


  InstituteViews. Topic:7. Management was generally supportive of
me   \
```

```
0                                        Agree
1                               Strongly Agree
2                               Strongly Agree
3                                        Agree
4                               Strongly Agree


   InstituteViews. Topic:8. Management was generally supportive of my
team  \
0                                        Agree
1                                        Agree
2                                        Agree
3                                        Agree
4                               Strongly Agree


   InstituteViews. Topic:9. I was kept informed of the changes in the
organisation which would affect me  \
0                                        Agree
1                               Strongly Agree
2                                        Agree
3                                        Agree
4                                        Agree


   InstituteViews. Topic:10. Staff morale was positive within the
Institute  \
0                                        Agree
1                                        Agree
2                                        Agree
3                                        Agree
4                               Strongly Agree


   InstituteViews. Topic:11. If I had a workplace issue it was dealt
```

```
with quickly  \
0                               Agree

1                               Agree

2                               Agree

3                               Agree

4                      Strongly Agree


   InstituteViews. Topic:12. If I had a workplace issue it was dealt
with efficiently  \
0                               Agree

1                               Agree

2                             Neutral

3                               Agree

4                               Agree


   InstituteViews. Topic:13. If I had a workplace issue it was dealt
with discreetly  \
0                               Agree

1                            Disagree

2                             Neutral

3                               Agree

4                      Strongly Agree


   WorkUnitViews. Topic:14. I was satisfied with the quality of the
management and supervision within my work unit  \
0                               Agree

1                      Strongly Agree

2                      Strongly Agree

3                      Strongly Agree

4                      Strongly Agree
```

```
  WorkUnitViews. Topic:15. I worked well with my colleagues  \
0                                           Agree
1                                  Strongly Agree
2                                  Strongly Agree
3                                  Strongly Agree
4                                  Strongly Agree

  WorkUnitViews. Topic:16. My job was challenging and interesting  \
0                                           Agree
1                                  Strongly Agree
2                                           Agree
3                                  Strongly Agree
4                                  Strongly Agree

  WorkUnitViews. Topic:17. I was encouraged to use my initiative in
the course of my work  \
0                                  Strongly Agree

1                                           Agree

2                                           Agree

3                                  Strongly Agree

4                                  Strongly Agree


  WorkUnitViews. Topic:18. I had sufficient contact with other people
in my job  \
0                                           Agree

1                                           Agree

2                                           Agree

3                                  Strongly Agree

4                                  Strongly Agree


  WorkUnitViews. Topic:19. I was given adequate support and co-
operation by my peers to enable me to do my job  \
0                                           Agree

1                                           Agree

2                                           Agree

3                                  Strongly Agree

4                                  Strongly Agree
```

```
  WorkUnitViews. Topic:20. I was able to use the full range of my
skills in my job  \
0                                              Agree

1                                     Strongly Agree

2                                              Agree

3                                     Strongly Agree

4                                     Strongly Agree


  WorkUnitViews. Topic:21. I was able to use the full range of my
abilities in my job. ; Category:Level of Agreement; Question:YOUR
VIEWS ABOUT YOUR WORK UNIT]  \
0                                              Agree

1                                              Agree

2                                              Agree

3                                     Strongly Agree

4                                     Strongly Agree


  WorkUnitViews. Topic:22. I was able to use the full range of my
knowledge in my job  \
0                                              Agree

1                                              Agree

2                                              Agree

3                                     Strongly Agree

4                                     Strongly Agree


  WorkUnitViews. Topic:23. My job provided sufficient variety  \
0                                              Agree
1                                              Agree
2                                              Agree
3                                     Strongly Agree
4                                     Strongly Agree

  WorkUnitViews. Topic:24. I was able to cope with the level of stress
and pressure in my job  \
```

```
0                                        Agree
1                               Strongly Agree
2                                        Agree
3                               Strongly Agree
4                               Strongly Agree

  WorkUnitViews. Topic:25. My job allowed me to balance the demands of
work and family to my satisfaction  \
0                                        Agree
1                                        Agree
2                                        Agree
3                               Strongly Agree
4                               Strongly Agree

  WorkUnitViews. Topic:26. My supervisor gave me adequate personal
recognition and feedback on my performance  \
0                                        Agree
1                               Strongly Agree
2                                        Agree
3                               Strongly Agree
4                               Strongly Agree

  WorkUnitViews. Topic:27. My working environment was satisfactory
e.g. sufficient space, good lighting, suitable seating and working
area  \
0                                        Agree
1                               Strongly Agree
2                                        Agree
3                               Strongly Agree
4                               Strongly Agree
```

```
   WorkUnitViews. Topic:28. I was given the opportunity to mentor and
coach others in order for me to pass on my skills and knowledge prior
to my cessation date  \
0                                                      Neutral

1                                                        Agree

2                                                        Agree

3                                              Strongly Agree

4                                              Strongly Agree


   WorkUnitViews. Topic:29. There was adequate communication between
staff in my unit  \
0                                                        Agree

1                                                        Agree

2                                                        Agree

3                                              Strongly Agree

4                                              Strongly Agree


   WorkUnitViews. Topic:30. Staff morale was positive within my work
unit  \
0                                                        Agree

1                                              Strongly Agree

2                                                        Agree

3                                              Strongly Agree

4                                              Strongly Agree


   Induction. Did you undertake Workplace Induction?  \
0                                                   Yes
1                                                    No
2                                                    No
3                                                   Yes
4                                                   Yes

   InductionInfo. Topic:Did you undertake a Corporate Induction?  \
0                                                   Yes
1                                                   NaN
2                                                   NaN
```

```
3                                                  No
4                                                 Yes

  InductionInfo. Topic:Did you undertake a Institute Induction?  \
0                                                 Yes
1                                                 NaN
2                                                 NaN
3                                                 Yes
4                                                 Yes

  InductionInfo. Topic: Did you undertake Team Induction?  \
0                                                 Yes
1                                                 NaN
2                                                 NaN
3                                                 Yes
4                                                 Yes

  InductionInfo. Face to Face Topic:Did you undertake a Corporate
Induction; Category:How it was conducted?  \
0                                        Face to Face

1                                                 NaN

2                                                 NaN

3                                                   -

4                                                   -


  InductionInfo. On-line Topic:Did you undertake a Corporate
Induction; Category:How it was conducted?  \
0                                                   -

1                                                 NaN

2                                                 NaN

3                                                   -

4                                                   -


  InductionInfo. Induction Manual Topic:Did you undertake a Corporate
Induction?  \
0                                                   -

1                                                 NaN

2                                                 NaN
```

```
3                                                              -

4                                        Induction Manual


   InductionInfo. Face to Face Topic:Did you undertake a Institute
Induction?  \
0                                              Face to Face

1                                                       NaN

2                                                       NaN

3                                                       NaN

4                                              Face to Face


   InductionInfo. On-line Topic:Did you undertake a Institute
Induction?  \
0                                                         -

1                                                       NaN

2                                                       NaN

3                                                         -

4                                                         -


   InductionInfo. Induction Manual Topic:Did you undertake a Institute
Induction?  \
0                                                         -

1                                                       NaN

2                                                       NaN

3                                                         -

4                                                         -


   InductionInfo. Face to Face Topic: Did you undertake Team Induction;
Category?  \
0                                              Face to Face

1                                                       NaN

2                                                       NaN
```

```
3                                                               -

4                                                     Face to Face


  InductionInfo. On-line Topic: Did you undertake Team Induction?
process you undertook and how it was conducted.]  \
0                                                               -

1                                                             NaN

2                                                             NaN

3                                                               -

4                                                               -


  InductionInfo. Induction Manual Topic: Did you undertake Team
Induction?  \
0                                                               -

1                                                             NaN

2                                                             NaN

3                                                               -

4                                                               -


  Workplace. Topic:Did you and your Manager develop a Performance and
Professional Development Plan (PPDP)?  \
0                                                             Yes

1                                                             Yes

2                                                             Yes

3                                                             Yes

4                                                             Yes


  Workplace. Topic:Does your workplace promote a work culture free
from all forms of unlawful discrimination?  \
0                                                             Yes

1                                                             Yes
```

```
2                                                       Yes

3                                                       Yes

4                                                       Yes


   Workplace. Topic:Does your workplace promote and practice the
principles of employment equity?   \
0                                                       Yes

1                                                       Yes

2                                                       Yes

3                                                       Yes

4                                                       Yes


   Workplace. Topic:Does your workplace value the diversity of its
employees?   \
0                                                       Yes

1                                                       Yes

2                                                       Yes

3                                                       Yes

4                                                       Yes


   Workplace. Topic:Would you recommend the Institute as an employer to
others?   \
0                                                       Yes

1                                                       Yes

2                                                       Yes

3                                                       Yes

4                                                       Yes


   Gender. What is your Gender? CurrentAge. Current Age   \
0                         Female                      26  30
1                            NaN                         NaN
2                            NaN                         NaN
3                            NaN                         NaN
```

```
4                              Male                    41  45

  Employment Type. Employment Type Classification. Classification  \
0              Temporary Full-time              Administration (AO)
1                             NaN                              NaN
2                             NaN                              NaN
3                             NaN                              NaN
4              Permanent Full-time        Teacher (including LVT)

  LengthofServiceOverall. Overall Length of Service at Institute (in
years)  \
0                                                     1-2

1                                                     NaN

2                                                     NaN

3                                                     NaN

4                                                     3-4


  LengthofServiceCurrent. Length of Service at current workplace (in
years)
0                                                     1-2

1                                                     NaN

2                                                     NaN

3                                                     NaN

4                                                     3-4


tafe_survey.columns

Index(['Record ID', 'Institute', 'WorkArea', 'CESSATION YEAR',
       'Reason for ceasing employment',
       'Contributing Factors. Career Move - Public Sector ',
       'Contributing Factors. Career Move - Private Sector ',
       'Contributing Factors. Career Move - Self-employment',
       'Contributing Factors. Ill Health',
       'Contributing Factors. Maternity/Family',
       'Contributing Factors. Dissatisfaction',
       'Contributing Factors. Job Dissatisfaction',
       'Contributing Factors. Interpersonal Conflict',
       'Contributing Factors. Study', 'Contributing Factors. Travel',
       'Contributing Factors. Other', 'Contributing Factors. NONE',
       'Main Factor. Which of these was the main factor for leaving?',
       'InstituteViews. Topic:1. I feel the senior leadership had a
```

clear vision and direction',
        'InstituteViews. Topic:2. I was given access to skills training to help me do my job better',
        'InstituteViews. Topic:3. I was given adequate opportunities for personal development',
        'InstituteViews. Topic:4. I was given adequate opportunities for promotion within %Institute]Q25LBL%',
        'InstituteViews. Topic:5. I felt the salary for the job was right for the responsibilities I had',
        'InstituteViews. Topic:6. The organisation recognised when staff did good work',
        'InstituteViews. Topic:7. Management was generally supportive of me',
        'InstituteViews. Topic:8. Management was generally supportive of my team',
        'InstituteViews. Topic:9. I was kept informed of the changes in the organisation which would affect me',
        'InstituteViews. Topic:10. Staff morale was positive within the Institute',
        'InstituteViews. Topic:11. If I had a workplace issue it was dealt with quickly',
        'InstituteViews. Topic:12. If I had a workplace issue it was dealt with efficiently',
        'InstituteViews. Topic:13. If I had a workplace issue it was dealt with discreetly',
        'WorkUnitViews. Topic:14. I was satisfied with the quality of the management and supervision within my work unit',
        'WorkUnitViews. Topic:15. I worked well with my colleagues',
        'WorkUnitViews. Topic:16. My job was challenging and interesting',
        'WorkUnitViews. Topic:17. I was encouraged to use my initiative in the course of my work',
        'WorkUnitViews. Topic:18. I had sufficient contact with other people in my job',
        'WorkUnitViews. Topic:19. I was given adequate support and co-operation by my peers to enable me to do my job',
        'WorkUnitViews. Topic:20. I was able to use the full range of my skills in my job',
        'WorkUnitViews. Topic:21. I was able to use the full range of my abilities in my job. ; Category:Level of Agreement; Question:YOUR VIEWS ABOUT YOUR WORK UNIT]',
        'WorkUnitViews. Topic:22. I was able to use the full range of my knowledge in my job',
        'WorkUnitViews. Topic:23. My job provided sufficient variety',
        'WorkUnitViews. Topic:24. I was able to cope with the level of stress and pressure in my job',
        'WorkUnitViews. Topic:25. My job allowed me to balance the demands of work and family to my satisfaction',
        'WorkUnitViews. Topic:26. My supervisor gave me adequate

personal recognition and feedback on my performance',
        'WorkUnitViews. Topic:27. My working environment was
satisfactory e.g. sufficient space, good lighting, suitable seating
and working area',
        'WorkUnitViews. Topic:28. I was given the opportunity to mentor
and coach others in order for me to pass on my skills and knowledge
prior to my cessation date',
        'WorkUnitViews. Topic:29. There was adequate communication
between staff in my unit',
        'WorkUnitViews. Topic:30. Staff morale was positive within my
work unit',
        'Induction. Did you undertake Workplace Induction?',
        'InductionInfo. Topic:Did you undertake a Corporate
Induction?',
        'InductionInfo. Topic:Did you undertake a Institute
Induction?',
        'InductionInfo. Topic: Did you undertake Team Induction?',
        'InductionInfo. Face to Face Topic:Did you undertake a
Corporate Induction; Category:How it was conducted?',
        'InductionInfo. On-line Topic:Did you undertake a Corporate
Induction; Category:How it was conducted?',
        'InductionInfo. Induction Manual Topic:Did you undertake a
Corporate Induction?',
        'InductionInfo. Face to Face Topic:Did you undertake a
Institute Induction?',
        'InductionInfo. On-line Topic:Did you undertake a Institute
Induction?',
        'InductionInfo. Induction Manual Topic:Did you undertake a
Institute Induction?',
        'InductionInfo. Face to Face Topic: Did you undertake Team
Induction; Category?',
        'InductionInfo. On-line Topic: Did you undertake Team
Induction?process you undertook and how it was conducted.]',
        'InductionInfo. Induction Manual Topic: Did you undertake Team
Induction?',
        'Workplace. Topic:Did you and your Manager develop a
Performance and Professional Development Plan (PPDP)?',
        'Workplace. Topic:Does your workplace promote a work culture
free from all forms of unlawful discrimination?',
        'Workplace. Topic:Does your workplace promote and practice the
principles of employment equity?',
        'Workplace. Topic:Does your workplace value the diversity of
its employees?',
        'Workplace. Topic:Would you recommend the Institute as an
employer to others?',
        'Gender. What is your Gender?', 'CurrentAge. Current Age',
        'Employment Type. Employment Type', 'Classification.
Classification',
        'LengthofServiceOverall. Overall Length of Service at Institute

```
(in years)',
       'LengthofServiceCurrent. Length of Service at current workplace
(in years)'],
      dtype='object')

tafe_survey.dtypes

Record ID
float64
Institute
object
WorkArea
object
CESSATION YEAR
float64
Reason for ceasing employment
object

...
CurrentAge. Current Age
object
Employment Type. Employment Type
object
Classification. Classification
object
LengthofServiceOverall. Overall Length of Service at Institute (in
years)        object
LengthofServiceCurrent. Length of Service at current workplace (in
years)        object
Length: 72, dtype: object

dete_survey_updated = df.drop(df.columns[28:49], axis=1)
tafe_survey_updated = tafe_survey.drop(tafe_survey.columns[17:66],
axis=1)

#Check that the columns were dropped
print(dete_survey_updated.columns)
print(tafe_survey_updated.columns)

Index(['ID', 'SeparationType', 'Cease Date', 'DETE Start Date',
       'Role Start Date', 'Position', 'Classification', 'Region',
       'Business Unit', 'Employment Status', 'Career move to public
sector',
       'Career move to private sector', 'Interpersonal conflicts',
       'Job dissatisfaction', 'Dissatisfaction with the department',
       'Physical work environment', 'Lack of recognition',
       'Lack of job security', 'Work location', 'Employment
conditions',
       'Maternity/family', 'Relocation', 'Study/Travel', 'Ill Health',
       'Traumatic incident', 'Work life balance', 'Workload',
```

```
        'None of the above', 'Gender', 'Age', 'Aboriginal', 'Torres
Strait',
        'South Sea', 'Disability', 'NESB'],
       dtype='object')
Index(['Record ID', 'Institute', 'WorkArea', 'CESSATION YEAR',
        'Reason for ceasing employment',
        'Contributing Factors. Career Move - Public Sector ',
        'Contributing Factors. Career Move - Private Sector ',
        'Contributing Factors. Career Move - Self-employment',
        'Contributing Factors. Ill Health',
        'Contributing Factors. Maternity/Family',
        'Contributing Factors. Dissatisfaction',
        'Contributing Factors. Job Dissatisfaction',
        'Contributing Factors. Interpersonal Conflict',
        'Contributing Factors. Study', 'Contributing Factors. Travel',
        'Contributing Factors. Other', 'Contributing Factors. NONE',
        'Gender. What is your Gender?', 'CurrentAge. Current Age',
        'Employment Type. Employment Type', 'Classification.
Classification',
        'LengthofServiceOverall. Overall Length of Service at Institute
(in years)',
        'LengthofServiceCurrent. Length of Service at current workplace
(in years)'],
       dtype='object')

dete_survey_updated.columns

Index(['ID', 'SeparationType', 'Cease Date', 'DETE Start Date',
        'Role Start Date', 'Position', 'Classification', 'Region',
        'Business Unit', 'Employment Status', 'Career move to public
sector',
        'Career move to private sector', 'Interpersonal conflicts',
        'Job dissatisfaction', 'Dissatisfaction with the department',
        'Physical work environment', 'Lack of recognition',
        'Lack of job security', 'Work location', 'Employment
conditions',
        'Maternity/family', 'Relocation', 'Study/Travel', 'Ill Health',
        'Traumatic incident', 'Work life balance', 'Workload',
        'None of the above', 'Gender', 'Age', 'Aboriginal', 'Torres
Strait',
        'South Sea', 'Disability', 'NESB'],
       dtype='object')

df.columns[28:49]

Index(['Professional Development', 'Opportunities for promotion',
        'Staff morale', 'Workplace issue', 'Physical environment',
        'Worklife balance', 'Stress and pressure support',
        'Performance of supervisor', 'Peer support', 'Initiative',
'Skills',
```

```
        'Coach', 'Career Aspirations', 'Feedback', 'Further PD',
        'Communication', 'My say', 'Information', 'Kept informed',
        'Wellness programs', 'Health & Safety'],
      dtype='object')
```

```
df['Staff morale'].unique()    # for the analysis we need to know the
meaning of N,DS, A, D....
```

```
array(['N', 'SD', 'A', 'D', 'SA', 'M', nan], dtype=object)
```

```
dete_survey_updated.columns =
dete_survey_updated.columns.str.lower().str.strip().str.replace(' ',
'_')
```

```
# Check that the column names were updated correctly
dete_survey_updated.columns
```

```
Index(['id', 'separationtype', 'cease_date', 'dete_start_date',
       'role_start_date', 'position', 'classification', 'region',
       'business_unit', 'employment_status',
'career_move_to_public_sector',
       'career_move_to_private_sector', 'interpersonal_conflicts',
       'job_dissatisfaction', 'dissatisfaction_with_the_department',
       'physical_work_environment', 'lack_of_recognition',
       'lack_of_job_security', 'work_location',
'employment_conditions',
       'maternity/family', 'relocation', 'study/travel', 'ill_health',
       'traumatic_incident', 'work_life_balance', 'workload',
       'none_of_the_above', 'gender', 'age', 'aboriginal',
'torres_strait',
       'south_sea', 'disability', 'nesb'],
      dtype='object')
```

```
tafe_survey_updated.head(1)
```

```
      Record ID                            Institute  \
0  6.341330e+17  Southern Queensland Institute of TAFE

                   WorkArea  CESSATION YEAR Reason for ceasing
employment  \
0  Non-Delivery (corporate)          2010.0              Contract
Expired

  Contributing Factors. Career Move - Public Sector   \
0                                               NaN

  Contributing Factors. Career Move - Private Sector   \
0                                               NaN

  Contributing Factors. Career Move - Self-employment  \
0                                               NaN
```

```
   Contributing Factors. Ill Health Contributing Factors.
Maternity/Family  \
0                          NaN
NaN

   Contributing Factors. Dissatisfaction  \
0                                    NaN

   Contributing Factors. Job Dissatisfaction  \
0                                        NaN

   Contributing Factors. Interpersonal Conflict Contributing Factors.
Study  \
0                                        NaN
NaN

   Contributing Factors. Travel Contributing Factors. Other  \
0                          NaN                          NaN

   Contributing Factors. NONE Gender. What is your Gender?  \
0                          NaN                      Female

   CurrentAge. Current Age Employment Type. Employment Type  \
0                      26  30              Temporary Full-time

   Classification. Classification  \
0            Administration (AO)

   LengthofServiceOverall. Overall Length of Service at Institute (in
years)  \
0                                                1-2


   LengthofServiceCurrent. Length of Service at current workplace (in
years)
0                                                1-2


dete_survey_updated.head(1)

   id       separationtype cease_date  dete_start_date
role_start_date  \
0   1  Ill Health Retirement    08/2012            1984.0
2004.0

        position classification          region  \
0  Public Servant        A01-A04  Central Office

                    business_unit    employment_status  \
0  Corporate Strategy and Peformance  Permanent Full-time
```

```
    career_move_to_public_sector  career_move_to_private_sector  \
0                            True                          False

    interpersonal_conflicts  job_dissatisfaction  \
0                      False                 True

    dissatisfaction_with_the_department  physical_work_environment  \
0                                  False                      False

    lack_of_recognition  lack_of_job_security  work_location  \
0                   True                 False          False

    employment_conditions  maternity/family  relocation
study/travel  \
0                    False             False       False         False


    ill_health  traumatic_incident  work_life_balance  workload  \
0       False               False              False     False

    none_of_the_above gender    age aboriginal  torres_strait  south_sea
\
0                True   Male  56-60       NaN            NaN        NaN


  disability nesb
0        NaN  Yes
mapping = {'Record ID': 'id', 'CESSATION YEAR': 'cease_date', 'Reason
for ceasing employment': 'separationtype', 'Gender. What is your
Gender?': 'gender', 'CurrentAge. Current Age': 'age',
        'Employment Type. Employment Type': 'employment_status',
        'Classification. Classification': 'position',
        'LengthofServiceOverall. Overall Length of Service at Institute
(in years)': 'institute_service',
        'LengthofServiceCurrent. Length of Service at current workplace
(in years)': 'role_service'}
tafe_survey_updated = tafe_survey_updated.rename(mapping, axis = 1)
# Check that the specified column names were updated correctly
tafe_survey_updated.columns

Index(['id', 'Institute', 'WorkArea', 'cease_date', 'separationtype',
        'Contributing Factors. Career Move - Public Sector ',
        'Contributing Factors. Career Move - Private Sector ',
        'Contributing Factors. Career Move - Self-employment',
        'Contributing Factors. Ill Health',
        'Contributing Factors. Maternity/Family',
        'Contributing Factors. Dissatisfaction',
        'Contributing Factors. Job Dissatisfaction',
        'Contributing Factors. Interpersonal Conflict',
```

```
       'Contributing Factors. Study', 'Contributing Factors. Travel',
       'Contributing Factors. Other', 'Contributing Factors. NONE',
'gender',
       'age', 'employment_status', 'position', 'institute_service',
       'role_service'],
      dtype='object')
```

dete_survey_updated.head(1)

```
   id          separationtype cease_date  dete_start_date
role_start_date  \
0   1  Ill Health Retirement    08/2012          1984.0
2004.0

        position classification          region  \
0  Public Servant        A01-A04  Central Office


                       business_unit    employment_status  \
0  Corporate Strategy and Peformance  Permanent Full-time

   career_move_to_public_sector  career_move_to_private_sector  \
0                          True                          False

   interpersonal_conflicts  job_dissatisfaction  \
0                    False                 True

   dissatisfaction_with_the_department  physical_work_environment  \
0                                False                      False

   lack_of_recognition  lack_of_job_security  work_location  \
0                 True                 False          False

   employment_conditions  maternity/family  relocation
study/travel  \
0                  False             False       False         False


   ill_health  traumatic_incident  work_life_balance  workload  \
0       False               False              False     False

   none_of_the_above gender    age aboriginal torres_strait south_sea
\
0               True   Male  56-60        NaN           NaN        NaN


  disability nesb
0        NaN  Yes
```

tafe_survey_updated.head(1)

```
              id                              Institute  \
0  6.341330e+17  Southern Queensland Institute of TAFE

                   WorkArea  cease_date    separationtype  \
0  Non-Delivery (corporate)      2010.0  Contract Expired

   Contributing Factors. Career Move - Public Sector   \
0                                               NaN

   Contributing Factors. Career Move - Private Sector   \
0                                               NaN

   Contributing Factors. Career Move - Self-employment  \
0                                               NaN

   Contributing Factors. Ill Health Contributing Factors.
Maternity/Family  \
0                             NaN
NaN

   Contributing Factors. Dissatisfaction  \
0                                    NaN

   Contributing Factors. Job Dissatisfaction  \
0                                        NaN

   Contributing Factors. Interpersonal Conflict Contributing Factors.
Study  \
0                                           NaN
NaN

   Contributing Factors. Travel Contributing Factors. Other  \
0                      NaN                             NaN

   Contributing Factors. NONE  gender    age    employment_status  \
0                         NaN  Female  26  30  Temporary Full-time

             position institute_service role_service
0  Administration (AO)               1-2          1-2

tafe_survey_updated['separationtype'].value_counts()

separationtype
Resignation                340
Contract Expired           127
Retrenchment/ Redundancy   104
Retirement                  82
Transfer                    25
Termination                 23
Name: count, dtype: int64
```

```
dete_survey_updated['separationtype'].value_counts()

separationtype
Age Retirement                    285
Resignation-Other reasons         150
Resignation-Other employer         91
Resignation-Move overseas/interstate   70
Voluntary Early Retirement (VER)   67
Ill Health Retirement              61
Other                              49
Contract Expired                   34
Termination                        15
Name: count, dtype: int64

# Update all separation types containing the word "resignation" to
'Resignation'
dete_survey_updated['separationtype'] =
dete_survey_updated['separationtype'].str.split('-').str[0]

# Check the values in the separationtype column were updated correctly
dete_survey_updated['separationtype'].value_counts()

separationtype
Resignation                       311
Age Retirement                    285
Voluntary Early Retirement (VER)   67
Ill Health Retirement              61
Other                              49
Contract Expired                   34
Termination                        15
Name: count, dtype: int64

# Select only the resignation separation types from each dataframe
dete_resignations =
dete_survey_updated[dete_survey_updated['separationtype'] ==
'Resignation'].copy()
tafe_resignations =
tafe_survey_updated[tafe_survey_updated['separationtype'] ==
'Resignation'].copy()

dete_resignations.head(1)

   id separationtype cease_date  dete_start_date  role_start_date
position  \
3   4    Resignation    05/2012          2005.0           2006.0
Teacher

  classification              region business_unit
employment_status  \
3        Primary  Central Queensland          NaN  Permanent Full-
time
```

```
    career_move_to_public_sector  career_move_to_private_sector  \
3                           False                           True

    interpersonal_conflicts  job_dissatisfaction  \
3                     False                False

    dissatisfaction_with_the_department  physical_work_environment  \
3                                 False                      False

    lack_of_recognition  lack_of_job_security  work_location  \
3                False                 False          False

    employment_conditions  maternity/family  relocation
study/travel  \
3                  False             False       False          False


    ill_health  traumatic_incident  work_life_balance  workload  \
3       False               False              False     False

    none_of_the_above  gender    age aboriginal torres_strait south_sea
\
3              False  Female  36-40        NaN           NaN        NaN


  disability nesb
3        NaN  NaN

tafe_resignations.head(1)

              id                  Institute                 WorkArea
\
3  6.341399e+17  Mount Isa Institute of TAFE  Non-Delivery (corporate)


   cease_date separationtype  \
3      2010.0    Resignation

  Contributing Factors. Career Move - Public Sector   \
3                                                  -

  Contributing Factors. Career Move - Private Sector   \
3                                                   -

  Contributing Factors. Career Move - Self-employment  \
3                                                   -

  Contributing Factors. Ill Health Contributing Factors.
Maternity/Family  \
3                                               -
```

```
-

  Contributing Factors. Dissatisfaction  \
3                                        -

  Contributing Factors. Job Dissatisfaction  \
3                                            -

  Contributing Factors. Interpersonal Conflict Contributing Factors.
Study  \
3                                                                  -
-

  Contributing Factors. Travel Contributing Factors. Other  \
3                         Travel                           -

  Contributing Factors. NONE gender   age employment_status position  \
3                           -    NaN  NaN                 NaN      NaN

   institute_service role_service
3                NaN          NaN
```

```
dete_resignations['cease_date'].value_counts()
```

```
cease_date
2012        126
2013         74
01/2014      22
12/2013      17
06/2013      14
09/2013      11
07/2013       9
11/2013       9
10/2013       6
08/2013       4
05/2012       2
05/2013       2
07/2012       1
2010          1
09/2010       1
07/2006       1
Name: count, dtype: int64
```

```python
# Extract the years and convert them to a float type
dete_resignations['cease_date'] =
dete_resignations['cease_date'].str.split('/').str[-1]
dete_resignations['cease_date'] =
dete_resignations['cease_date'].astype("float")

# Check the values again and look for outliers
dete_resignations['cease_date'].value_counts()
```

```
cease_date
2012        126
2013         74
01/2014      22
12/2013      17
06/2013      14
09/2013      11
07/2013       9
11/2013       9
10/2013       6
08/2013       4
05/2012       2
05/2013       2
07/2012       1
2010          1
09/2010       1
07/2006       1
Name: count, dtype: int64

dete_resignations['dete_start_date'].value_counts().sort_values()

dete_start_date
1987.0      1
1975.0      1
1984.0      1
1971.0      1
1973.0      1
1972.0      1
1963.0      1
1977.0      1
1982.0      1
1974.0      2
1983.0      2
1976.0      2
1985.0      3
2001.0      3
1986.0      3
1995.0      4
1988.0      4
1991.0      4
1989.0      4
1993.0      5
1980.0      5
1990.0      5
1997.0      5
2002.0      6
1998.0      6
1996.0      6
1992.0      6
2003.0      6
```

```
1994.0      6
1999.0      8
2000.0      9
2013.0     10
2006.0     13
2009.0     13
2004.0     14
2005.0     15
2010.0     17
2007.0     21
2012.0     21
2008.0     22
2011.0     24
Name: count, dtype: int64
```

```python
tafe_resignations['cease_date'].value_counts().sort_values()
```

```
cease_date
2009.0      2
2013.0     55
2010.0     68
2012.0     94
2011.0    116
Name: count, dtype: int64
```

```python
dete_resignations['institute_service'] =
dete_resignations['cease_date'] -dete_resignations['dete_start_date']

# Quick check of the result
dete_resignations['institute_service'].head()
```

```
3       7.0
5      18.0
8       3.0
9      15.0
11      3.0
Name: institute_service, dtype: float64
```

```python
dete_resignations.head()
```

```
    id separationtype  cease_date  dete_start_date  role_start_date  \
3    4     Resignation      2012.0           2005.0           2006.0
5    6     Resignation      2012.0           1994.0           1997.0
8    9     Resignation      2012.0           2009.0           2009.0
9   10     Resignation      2012.0           1997.0           2008.0
11  12     Resignation      2012.0           2009.0           2009.0


             position  classification              region  \
3             Teacher         Primary   Central Queensland
5    Guidance Officer             NaN       Central Office
8             Teacher       Secondary     North Queensland
```

```
9       Teacher Aide                NaN                           NaN
11          Teacher          Secondary  Far North Queensland

            business_unit     employment_status
career_move_to_public_sector  \
3                     NaN  Permanent Full-time
False
5   Education Queensland  Permanent Full-time
False
8                     NaN  Permanent Full-time
False
9                     NaN  Permanent Part-time
False
11                    NaN  Permanent Full-time
False

    career_move_to_private_sector  interpersonal_conflicts  \
3                            True                    False
5                            True                    False
8                            True                    False
9                           False                     True
11                          False                    False

    job_dissatisfaction  dissatisfaction_with_the_department  \
3                  False                                False
5                  False                                False
8                  False                                False
9                   True                                 True
11                 False                                False

    physical_work_environment  lack_of_recognition
lack_of_job_security  \
3                      False                   False
False
5                      False                   False
False
8                      False                   False
False
9                      False                   False
False
11                     False                   False
False

    work_location  employment_conditions  maternity/family  relocation
\
3           False                  False             False       False

5           False                   True              True       False

8           False                  False             False       False
```

	study/travel	ill_health	traumatic_incident	work_life_balance	workload

```
9              False                   False                   False            False

11             False                   False                    True             True


      study/travel  ill_health  traumatic_incident  work_life_balance  \
workload  \
3             False       False               False              False
False
5             False       False               False              False
False
8             False       False               False              False
False
9             False       False               False              False
False
11            False       False               False              False
False

      none_of_the_above  gender    age aboriginal torres_strait
south_sea  \
3                 False  Female  36-40        NaN           NaN
NaN
5                 False  Female  41-45        NaN           NaN
NaN
8                 False  Female  31-35        NaN           NaN
NaN
9                 False  Female  46-50        NaN           NaN
NaN
11                False    Male  31-35        NaN           NaN
NaN

   disability nesb  institute_service
3         NaN  NaN                7.0
5         NaN  NaN               18.0
8         NaN  NaN                3.0
9         NaN  NaN               15.0
11        NaN  NaN                3.0
```

dete_resignations.reset_index()

```
      index   id separationtype  cease_date  dete_start_date
role_start_date  \
0         3    4    Resignation      2012.0           2005.0
2006.0
1         5    6    Resignation      2012.0           1994.0
1997.0
2         8    9    Resignation      2012.0           2009.0
2009.0
3         9   10    Resignation      2012.0           1997.0
```

```
2008.0
4       11   12   Resignation     2012.0              2009.0
2009.0
..     ...  ...          ...        ...                 ...
...
306    808  810   Resignation     2013.0              2010.0
2010.0
307    815  817   Resignation     2014.0              2012.0
2012.0
308    816  818   Resignation     2014.0              2012.0
2012.0
309    819  821   Resignation     2014.0              2009.0
2009.0
310    821  823   Resignation     2013.0                 NaN
NaN

              position  classification                 region  \
0              Teacher         Primary      Central Queensland
1      Guidance Officer             NaN         Central Office
2              Teacher       Secondary        North Queensland
3         Teacher Aide             NaN                     NaN
4              Teacher       Secondary    Far North Queensland
..                 ...             ...                     ...
306       Teacher Aide             NaN                     NaN
307            Teacher         Primary    Far North Queensland
308            Teacher       Secondary             North Coast
309     Public Servant         A01-A04          Central Office
310       Teacher Aide             NaN            Metropolitan

            business_unit    employment_status
career_move_to_public_sector  \
0                     NaN  Permanent Full-time
False
1     Education Queensland  Permanent Full-time
False
2                     NaN  Permanent Full-time
False
3                     NaN  Permanent Part-time
False
4                     NaN  Permanent Full-time
False
..                    ...                  ...
...
306                   NaN  Permanent Part-time
False
307                   NaN  Permanent Full-time
False
308                   NaN  Permanent Full-time
False
```

```
309  Education Queensland  Permanent Full-time
False
310                        NaN                    NaN
False


     career_move_to_private_sector  interpersonal_conflicts  \
0                             True                    False
1                             True                    False
2                             True                    False
3                            False                     True
4                            False                    False
..                             ...                      ...
306                          False                    False
307                           True                    False
308                          False                    False
309                          False                    False
310                          False                    False

     job_dissatisfaction  dissatisfaction_with_the_department  \
0                  False                                False
1                  False                                False
2                  False                                False
3                   True                                 True
4                  False                                False
..                   ...                                  ...
306                False                                False
307                False                                False
308                False                                False
309                False                                False
310                False                                False

     physical_work_environment  lack_of_recognition
lack_of_job_security  \
0                        False                False
False
1                        False                False
False
2                        False                False
False
3                        False                False
False
4                        False                False
False
..                         ...                  ...
...
306                      False                False
False
307                      False                False
False
308                      False                False
```

```
False
309                             False                    False
False
310                             False                    False
False

     work_location  employment_conditions  maternity/family
relocation  \
0              False                    False                    False
False
1              False                     True                     True
False
2              False                    False                    False
False
3              False                    False                    False
False
4              False                    False                     True
True
..             ...                      ...                      ...        ..
.
306            False                    False                     True
False
307            False                    False                    False
False
308            False                    False                    False
False
309            False                    False                     True
True
310            False                    False                    False
False

     study/travel  ill_health  traumatic_incident
work_life_balance  \
0             False        False               False                 False

1             False        False               False                 False

2             False        False               False                 False

3             False        False               False                 False

4             False        False               False                 False

..             ...          ...                 ...                   ...

306           False        False               False                 False

307           False        False               False                 False

308            True        False               False                 False
```

```
309           False       False               False               True

310           False       False               False               False


     workload  none_of_the_above  gender    age aboriginal
torres_strait  \
0       False               False  Female  36-40        NaN
NaN
1       False               False  Female  41-45        NaN
NaN
2       False               False  Female  31-35        NaN
NaN
3       False               False  Female  46-50        NaN
NaN
4       False               False    Male  31-35        NaN
NaN
..        ...                 ...     ...    ...        ...        .
..
306     False               False  Female  26-30        NaN
NaN
307     False               False    Male  21-25        NaN
NaN
308     False               False  Female  21-25        NaN
NaN
309     False               False  Female  31-35        NaN
NaN
310     False               False     NaN    NaN        NaN
NaN

     south_sea disability nesb  institute_service
0          NaN        NaN  NaN                7.0
1          NaN        NaN  NaN               18.0
2          NaN        NaN  NaN                3.0
3          NaN        NaN  NaN               15.0
4          NaN        NaN  NaN                3.0
..         ...        ...  ...                ...
306        NaN        NaN  NaN                3.0
307        NaN        NaN  NaN                2.0
308        NaN        NaN  NaN                2.0
309        NaN        NaN  NaN                5.0
310        NaN        NaN  NaN                NaN

[311 rows x 37 columns]

tafe_resignations['Contributing Factors.
Dissatisfaction'].value_counts()
```

```
Contributing Factors. Dissatisfaction
-                                                277
Contributing Factors. Dissatisfaction      55
Name: count, dtype: int64
```

```python
tafe_resignations['Contributing Factors. Job
Dissatisfaction'].value_counts()
```

```
Contributing Factors. Job Dissatisfaction
-                              270
Job Dissatisfaction       62
Name: count, dtype: int64
```

```python
# Update the values in the contributing factors columns to be either
True, False, or NaN
def update_vals(x):
    if x == '-':
        return False
    elif pd.isnull(x):
        return np.nan
    else:
        return True
tafe_resignations['dissatisfied'] = tafe_resignations[['Contributing
Factors. Dissatisfaction', 'Contributing Factors. Job
Dissatisfaction']].map(update_vals).any(axis=1)
tafe_resignations_up = tafe_resignations.copy()

# Check the unique values after the updates
tafe_resignations_up['dissatisfied'].value_counts(dropna=False)
```

```
dissatisfied
True      332
False       8
Name: count, dtype: int64
```

```python
# Define the function to update values
def update_vals(x):
    if x == '-':
        return False
    elif pd.isnull(x):
        return np.nan
    else:
        return True

# Apply the function to each of the contributing factor columns
individually
tafe_resignations['Contributing Factors. Dissatisfaction'] =
tafe_resignations['Contributing Factors.
Dissatisfaction'].apply(update_vals)
tafe_resignations['Contributing Factors. Job Dissatisfaction'] =
tafe_resignations['Contributing Factors. Job
```

```python
Dissatisfaction'].apply(update_vals)

# Combine the columns to create a new 'dissatisfied' column
tafe_resignations['dissatisfied'] = tafe_resignations[
    ['Contributing Factors. Dissatisfaction', 'Contributing Factors.
Job Dissatisfaction']
].any(axis=1, skipna=False)

# Make a copy of the updated DataFrame
tafe_resignations_up = tafe_resignations.copy()

# Check the unique values after the updates
print(tafe_resignations_up['dissatisfied'].value_counts(dropna=False))
```

```
dissatisfied
True     340
Name: count, dtype: int64
```

```python
# Update the values in columns related to dissatisfaction to be either
True, False, or NaN
dete_resignations['dissatisfied'] =
dete_resignations[['job_dissatisfaction',
        'dissatisfaction_with_the_department',
'physical_work_environment',
        'lack_of_recognition', 'lack_of_job_security', 'work_location',
        'employment_conditions', 'work_life_balance',
        'workload']].any(axis=1, skipna=False)
dete_resignations_up = dete_resignations.copy()
dete_resignations_up['dissatisfied'].value_counts(dropna=False)
```

```
dissatisfied
False     162
True      149
Name: count, dtype: int64
```

```python
# Add an institute column
dete_resignations_up['institute'] = 'DETE'
tafe_resignations_up['institute'] = 'TAFE'

# Combine the dataframes
combined = pd.concat([dete_resignations_up, tafe_resignations_up],
ignore_index=True)

# Verify the number of non null values in each column
combined.notnull().sum().sort_values()
```

```
torres_strait                                    0
south_sea                                        3
aboriginal                                       7
disability                                       8
nesb                                             9
```

```
business_unit                                           32
classification                                         161
region                                                 265
role_start_date                                        271
dete_start_date                                        283
role_service                                           290
none_of_the_above                                      311
work_life_balance                                      311
traumatic_incident                                     311
ill_health                                             311
study/travel                                           311
relocation                                             311
maternity/family                                       311
employment_conditions                                  311
workload                                               311
lack_of_job_security                                   311
career_move_to_public_sector                           311
career_move_to_private_sector                          311
interpersonal_conflicts                                311
work_location                                          311
dissatisfaction_with_the_department                    311
physical_work_environment                              311
lack_of_recognition                                    311
job_dissatisfaction                                    311
Contributing Factors. Job Dissatisfaction             332
Contributing Factors. Travel                           332
Contributing Factors. Maternity/Family                 332
Contributing Factors. Ill Health                       332
Contributing Factors. Career Move - Self-employment    332
Contributing Factors. Career Move - Private Sector     332
Contributing Factors. Career Move - Public Sector      332
Contributing Factors. Dissatisfaction                  332
Contributing Factors. Other                            332
Contributing Factors. Interpersonal Conflict           332
Contributing Factors. NONE                             332
Contributing Factors. Study                            332
Institute                                              340
WorkArea                                               340
institute_service                                      563
gender                                                 592
age                                                    596
employment_status                                      597
position                                               598
cease_date                                             635
dissatisfied                                           651
separationtype                                         651
institute                                              651
id                                                     651
dtype: int64
```

```python
# Combine the dataframes
combined = pd.concat([dete_resignations_up, tafe_resignations_up],
ignore_index=True)

# Verify the number of null values in each column
combined.isna().sum().sort_values()
```

```
id                                                      0
separationtype                                          0
dissatisfied                                            0
institute                                               0
cease_date                                             16
position                                               53
employment_status                                      54
age                                                    55
gender                                                 59
institute_service                                      88
Institute                                             311
WorkArea                                              311
Contributing Factors. Career Move - Public Sector     319
Contributing Factors. Career Move - Private Sector    319
Contributing Factors. Ill Health                      319
Contributing Factors. Maternity/Family                319
Contributing Factors. Dissatisfaction                 319
Contributing Factors. Job Dissatisfaction             319
Contributing Factors. Interpersonal Conflict          319
Contributing Factors. Study                           319
Contributing Factors. Travel                          319
Contributing Factors. Other                           319
Contributing Factors. Career Move - Self-employment   319
Contributing Factors. NONE                            319
none_of_the_above                                     340
workload                                              340
traumatic_incident                                    340
career_move_to_public_sector                          340
career_move_to_private_sector                         340
interpersonal_conflicts                               340
job_dissatisfaction                                   340
dissatisfaction_with_the_department                   340
physical_work_environment                             340
work_life_balance                                     340
lack_of_job_security                                  340
work_location                                         340
lack_of_recognition                                   340
maternity/family                                      340
relocation                                            340
study/travel                                          340
ill_health                                            340
employment_conditions                                 340
role_service                                          361
```

```
dete_start_date                                            368
role_start_date                                            380
region                                                     386
classification                                             490
business_unit                                              619
nesb                                                       642
disability                                                 643
aboriginal                                                 644
south_sea                                                  648
torres_strait                                              651
dtype: int64

combined['torres_strait']

0        NaN
1        NaN
2        NaN
3        NaN
4        NaN
        ...
646      NaN
647      NaN
648      NaN
649      NaN
650      NaN
Name: torres_strait, Length: 651, dtype: object

combined.drop(['torres_strait','south_sea'],axis=1)

              id separationtype   cease_date   dete_start_date  \
0     4.000000e+00    Resignation      2012.0           2005.0
1     6.000000e+00    Resignation      2012.0           1994.0
2     9.000000e+00    Resignation      2012.0           2009.0
3     1.000000e+01    Resignation      2012.0           1997.0
4     1.200000e+01    Resignation      2012.0           2009.0
..            ...            ...         ...              ...
646   6.350660e+17    Resignation      2013.0              NaN
647   6.350668e+17    Resignation      2013.0              NaN
648   6.350677e+17    Resignation      2013.0              NaN
649   6.350704e+17    Resignation      2013.0              NaN
650   6.350730e+17    Resignation      2013.0              NaN


     role_start_date                     position classification  \
0             2006.0                      Teacher        Primary
1             1997.0              Guidance Officer            NaN
2             2009.0                      Teacher      Secondary
3             2008.0                  Teacher Aide            NaN
4             2009.0                      Teacher      Secondary
..               ...                          ...            ...
646              NaN              Operational (OO)            NaN
```

```
647                   NaN  Teacher (including LVT)               NaN
648                   NaN                     NaN               NaN
649                   NaN  Teacher (including LVT)               NaN
650                   NaN       Administration (AO)               NaN

                    region           business_unit
employment_status  \
0          Central Queensland                   NaN  Permanent Full-time

1             Central Office  Education Queensland  Permanent Full-time

2           North Queensland                   NaN  Permanent Full-time

3                        NaN                   NaN  Permanent Part-time

4      Far North Queensland                   NaN  Permanent Full-time

..                       ...                   ...                  ...

646                      NaN                   NaN  Temporary Full-time

647                      NaN                   NaN  Temporary Full-time

648                      NaN                   NaN                  NaN

649                      NaN                   NaN  Permanent Full-time

650                      NaN                   NaN       Contract/casual


     career_move_to_public_sector career_move_to_private_sector  \
0                           False                          True
1                           False                          True
2                           False                          True
3                           False                         False
4                           False                         False
..                            ...                           ...
646                           NaN                           NaN
647                           NaN                           NaN
648                           NaN                           NaN
649                           NaN                           NaN
650                           NaN                           NaN

     interpersonal_conflicts job_dissatisfaction  \
0                      False               False
1                      False               False
2                      False               False
3                       True                True
4                      False               False
..                       ...                 ...
646                      NaN                 NaN
```

```
647                       NaN              NaN
648                       NaN              NaN
649                       NaN              NaN
650                       NaN              NaN

     dissatisfaction_with_the_department physical_work_environment  \
0                                  False                     False
1                                  False                     False
2                                  False                     False
3                                   True                     False
4                                  False                     False
..                                   ...                       ...
646                                  NaN                       NaN
647                                  NaN                       NaN
648                                  NaN                       NaN
649                                  NaN                       NaN
650                                  NaN                       NaN

     lack_of_recognition lack_of_job_security work_location  \
0                  False                False         False
1                  False                False         False
2                  False                False         False
3                  False                False         False
4                  False                False         False
..                   ...                  ...           ...
646                  NaN                  NaN           NaN
647                  NaN                  NaN           NaN
648                  NaN                  NaN           NaN
649                  NaN                  NaN           NaN
650                  NaN                  NaN           NaN

     employment_conditions maternity/family relocation study/travel
ill_health  \
0                    False            False      False         False
False
1                     True             True      False         False
False
2                    False            False      False         False
False
3                    False            False      False         False
False
4                    False             True       True         False
False
..                     ...              ...        ...           ...
...
646                    NaN              NaN        NaN           NaN
NaN
647                    NaN              NaN        NaN           NaN
NaN
648                    NaN              NaN        NaN           NaN
```

```
NaN
649                    NaN              NaN        NaN           NaN
NaN
650                    NaN              NaN        NaN           NaN
NaN

     traumatic_incident work_life_balance workload none_of_the_above
gender  \
0                   False            False    False             False
Female
1                   False            False    False             False
Female
2                   False            False    False             False
Female
3                   False            False    False             False
Female
4                   False            False    False             False
Male
..                    ...              ...      ...               ...
...
646                   NaN              NaN      NaN               NaN
Male
647                   NaN              NaN      NaN               NaN
Male
648                   NaN              NaN      NaN               NaN
NaN
649                   NaN              NaN      NaN               NaN
Female
650                   NaN              NaN      NaN               NaN
Female

       age aboriginal disability nesb institute_service  dissatisfied
\
0    36-40        NaN        NaN  NaN               7.0         False

1    41-45        NaN        NaN  NaN              18.0          True

2    31-35        NaN        NaN  NaN               3.0         False

3    46-50        NaN        NaN  NaN              15.0          True

4    31-35        NaN        NaN  NaN               3.0         False

..     ...        ...        ...  ...               ...           ...

646  21  25        NaN        NaN  NaN               5-6          True

647  51-55        NaN        NaN  NaN               1-2          True

648    NaN        NaN        NaN  NaN               NaN          True
```

```
649   51-55      NaN        NaN  NaN                 5-6          True

650   26  30      NaN        NaN  NaN                 3-4          True


     institute                                     Institute  \
0        DETE                                            NaN
1        DETE                                            NaN
2        DETE                                            NaN
3        DETE                                            NaN
4        DETE                                            NaN
..        ...                                            ...
646      TAFE   Southern Queensland Institute of TAFE
647      TAFE             Barrier Reef Institute of TAFE
648      TAFE   Southern Queensland Institute of TAFE
649      TAFE         Tropical North Institute of TAFE
650      TAFE         Tropical North Institute of TAFE


                         WorkArea  \
0                             NaN
1                             NaN
2                             NaN
3                             NaN
4                             NaN
..                            ...
646  Non-Delivery (corporate)
647       Delivery (teaching)
648  Non-Delivery (corporate)
649       Delivery (teaching)
650  Non-Delivery (corporate)

    Contributing Factors. Career Move - Public Sector    \
0                                                NaN
1                                                NaN
2                                                NaN
3                                                NaN
4                                                NaN
..                                               ...
646                                                -
647                    Career Move - Public Sector
648                    Career Move - Public Sector
649                                                -
650                                                -

    Contributing Factors. Career Move - Private Sector   \
0                                                NaN
1                                                NaN
2                                                NaN
3                                                NaN
```

```
4                                                        NaN
..                                                       ...
646                           Career Move - Private Sector
647                                                         -
648                                                         -
649                                                         -
650                                                         -

    Contributing Factors. Career Move - Self-employment  \
0                                                    NaN
1                                                    NaN
2                                                    NaN
3                                                    NaN
4                                                    NaN
..                                                   ...
646                                                    -
647                                                    -
648                                                    -
649                                                    -
650                        Career Move - Self-employment

     Contributing Factors. Ill Health Contributing Factors.
Maternity/Family  \
0                                   NaN
NaN
1                                   NaN
NaN
2                                   NaN
NaN
3                                   NaN
NaN
4                                   NaN
NaN
..                                  ...
...
646                                   -
-
647                                   -
-
648                                   -
-
649                                   -
-
650                                   -
-

    Contributing Factors. Dissatisfaction  \
0                                      NaN
1                                      NaN
2                                      NaN
```

```
3                                       NaN
4                                       NaN
..                                      ...
646                                    True
647                                    True
648                                    True
649                                    True
650                                    True

    Contributing Factors. Job Dissatisfaction  \
0                                         NaN
1                                         NaN
2                                         NaN
3                                         NaN
4                                         NaN
..                                        ...
646                                      True
647                                      True
648                                      True
649                                      True
650                                      True

    Contributing Factors. Interpersonal Conflict Contributing Factors.
Study  \
0                                            NaN
NaN
1                                            NaN
NaN
2                                            NaN
NaN
3                                            NaN
NaN
4                                            NaN
NaN
..                                           ...
...
646                                            -
-
647                                            -
-
648                                            -
-
649                                            -
-
650                                            -
-

    Contributing Factors. Travel Contributing Factors. Other  \
0                                  NaN                      NaN
1                                  NaN                      NaN
```

2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
..	...	...
646	-	-
647	-	-
648	-	-
649	-	Other
650	Travel	-

	Contributing Factors. NONE	role_service
0	NaN	NaN
1	NaN	NaN
2	NaN	NaN
3	NaN	NaN
4	NaN	NaN
..	...	...
646	-	5-6
647	-	1-2
648	-	NaN
649	-	1-2
650	-	1-2

[651 rows x 51 columns]

```python
# Drop columns with less than 500 non null values
combined_updated = combined.dropna(thresh = 500, axis =1).copy()

combined_updated.notnull().sum().sort_values()
```

```
institute_service    563
gender               592
age                  596
employment_status    597
position             598
cease_date           635
id                   651
separationtype       651
dissatisfied         651
institute            651
dtype: int64
```

```python
# Check the unique values
combined_updated['institute_service'].value_counts(dropna=False)
```

```
institute_service
NaN                 88
Less than 1 year    73
1-2                 64
3-4                 63
5-6                 33
```

```
11-20                  26
5.0                    23
1.0                    22
7-10                   21
3.0                    20
0.0                    20
6.0                    17
4.0                    16
9.0                    14
2.0                    14
7.0                    13
More than 20 years     10
13.0                    8
8.0                     8
15.0                    7
20.0                    7
10.0                    6
14.0                    6
12.0                    6
17.0                    6
22.0                    6
18.0                    5
16.0                    5
11.0                    4
23.0                    4
24.0                    4
32.0                    3
39.0                    3
19.0                    3
21.0                    3
36.0                    2
25.0                    2
30.0                    2
26.0                    2
28.0                    2
49.0                    1
41.0                    1
27.0                    1
42.0                    1
29.0                    1
34.0                    1
31.0                    1
33.0                    1
35.0                    1
38.0                    1
Name: count, dtype: int64
```

```python
# Extract the years of service and convert the type to float
combined_updated['institute_service_up'] =
combined_updated['institute_service'].astype('str').str.extract(r'(\
```

```
d+)')
combined_updated['institute_service_up'] =
combined_updated['institute_service_up'].astype('float')

# Check the years extracted are correct
combined_updated['institute_service_up'].value_counts()
```

```
institute_service_up
1.0      159
3.0       83
5.0       56
7.0       34
11.0      30
0.0       20
20.0      17
6.0       17
4.0       16
9.0       14
2.0       14
13.0       8
8.0        8
15.0       7
17.0       6
10.0       6
22.0       6
14.0       6
12.0       6
18.0       5
16.0       5
24.0       4
23.0       4
21.0       3
19.0       3
39.0       3
32.0       3
25.0       2
28.0       2
26.0       2
36.0       2
30.0       2
34.0       1
27.0       1
29.0       1
42.0       1
33.0       1
41.0       1
35.0       1
49.0       1
38.0       1
```

```
31.0      1
Name: count, dtype: int64

# Convert years of service to categories
def transform_service(val):
    if val >= 11:
        return "Veteran"
    elif 7 <= val < 11:
        return "Established"
    elif 3 <= val < 7:
        return "Experienced"
    elif pd.isnull(val):
        return np.nan
    else:
        return "New"
combined_updated['service_cat'] =
combined_updated['institute_service_up'].apply(transform_service)

# Quick check of the update
combined_updated['service_cat'].value_counts()

service_cat
New            193
Experienced    172
Veteran        136
Established     62
Name: count, dtype: int64

combined_updated['service_cat'].value_counts().plot(kind='bar')

<Axes: xlabel='service_cat'>
```