THINKFUL Data Science

Capstone Project 1

Analysis on Employee Attrition Dataset and Underlying Trends

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Introduction



Source: https://medium.com/how-to-better-communicate-with-people/internal-communication-9c6da143d9e7

Employee Attrition

- Reduced Effectiveness of Workers at the Job.
- Low Productivity
- Reduced Motivation
- Employee Turnover

Dataset

35

Attributes

1470

Instances

Source

IBIV

```
PerformanceRating
Department Stock Option Level Hourly Rate Job Level Training Times Last Year
   OverTime YearsAtCompany MaritalStatus
  Gender Years Since Last Promotion Education
       Age Years With Curr Manager Daily Rate
EducationField YearsInCurrentRole
 Joblnvolvement Work Life Balance
     Attrition OverTotalWorkingYears
   Relationship Satisfaction Monthly Income
      MonthlyRate PercentSalaryHike
   JobSatisfaction
```

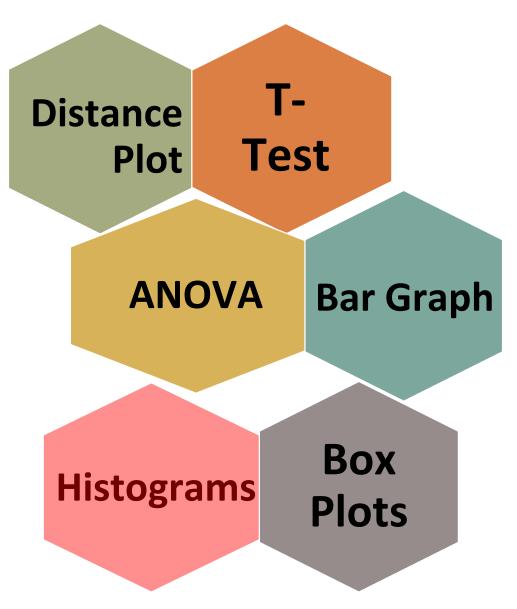
Heatmap(Section)

Total Working years	0.68	0.01	0	0.15	-0.01	-0	-0	-0.01	0.78	-0.02	0.77	0.03	0.24	-0.02	0.01	0.02	0.01	1	-0.04	0	0.63	0.46	0.4	0.46
TrainingTimesLastYear	-0.02	0	-0.04	-0.03	0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.02	0	-0.07	-0.01	-0.02	0	0.01	-0.04	1	0.03	0	-0.01	-0	-0
WorkLifeBalance	-0.02	-0.04	-0.03	0.01	0.01	0.03	-0	-0.01	0.04	-0.02	0.03	0.01	-0.01	-0	0	0.02	0	0	0.03	1	0.01	0.05	0.01	0
YearsAtCompany	0.31	-0.03	0.01	0.07	-0.01	0	-0.02	-0.02	0.53	-0	0.51	-0.02	-0.12	-0.04	0	0.02	0.02	0.63	0	0.01	1	0.76	0.62	0.77
YearsInCurrentRole	0.21	0.01	0.02	0.06	-0.01	0.02	-0.02	0.01	0.39	-0	0.36	-0.01	-0.09	-0	0.03	-0.02	0.05	0.46	-0.01	0.05	0.76	1	0.55	0.71
YearsSinceLastPromotion	0.22	-0.03	0.01	0.05	-0.01	0.02	-0.03	-0.02	0.35	-0.02	0.34	0	-0.04	-0.02	0.02	0.03	0.01	0.4	-0	0.01	0.62	0.55	1	0.51
YearsWithCurrManager	0.2	-0.03	0.01	0.07	-0.01	-0	-0.02	0.03	0.38	-0.03	0.34	-0.04	-0.11	-0.01	0.02	-0	0.02	0.46	-0	0	0.77	0.71	0.51	1
	Age	DailyRate	DistanceFromHome	Education	EmployeeNumber	EnvironmentSatisfaction	HourlyRate	Jobinvolvement	Job Level		Monthly Monthly Income	•	NumCompaniesWorked	PercentSalaryHike	PerformanceRating	RelationshipSatisfaction	StockOptionLevel	TotalWorkingYears	TrainingTimesLastYear		Years At Compan	YearsInCurrentRole	YearsSinceLastPromotion	YearsWithCurrManager

- 0.2

- 0.0

Hypothesis



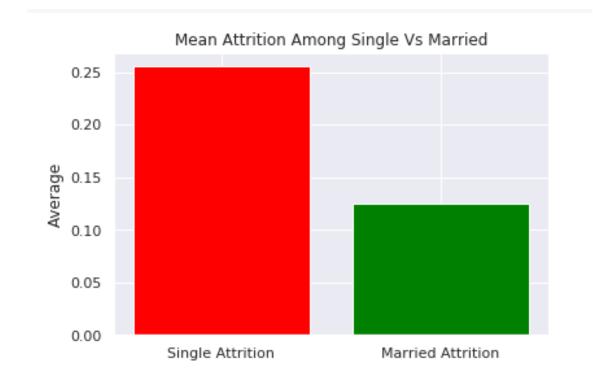
Are Married people more likely to be satisfied with their jobs compared to Single people?

Analysis

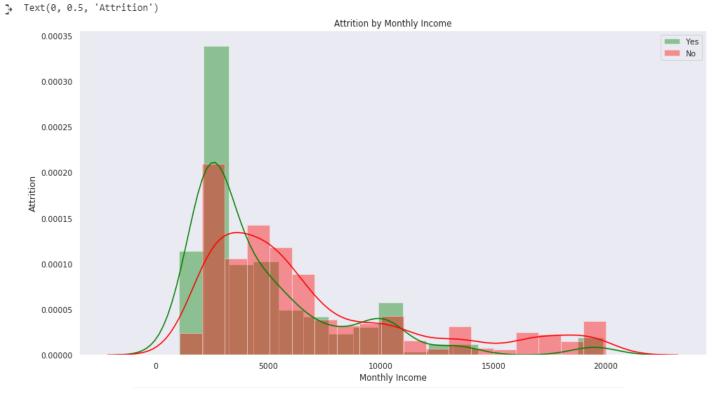
Groups	Sample Size	Attrition Rate						
Single	470	0.255						
Married	673	0.124						
Divorced	327	0.101						

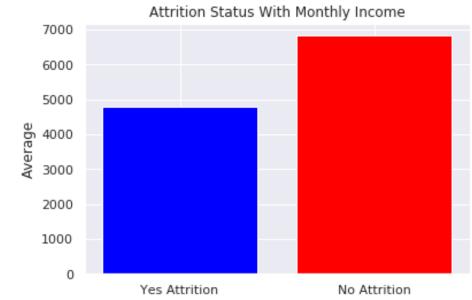
T-test Stats=5.75, **Pvalue**=1.17-08)

Is there a difference in Attrition rate between the single and married population?

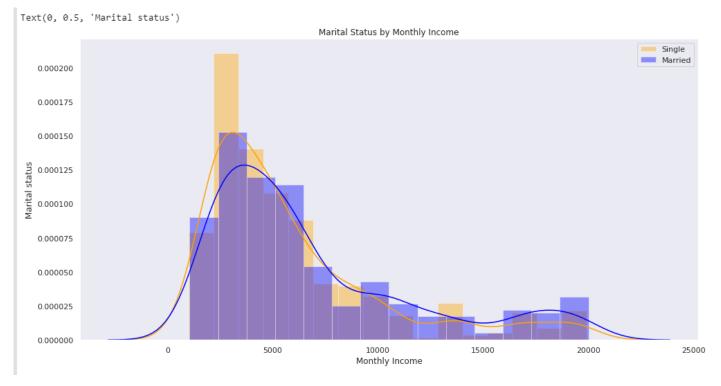


1. Why is the attrition rate higher among the single population?



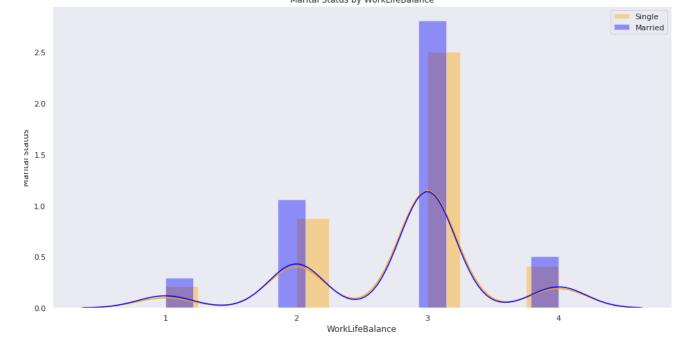


2. Why is the attrition rate higher among the single population?

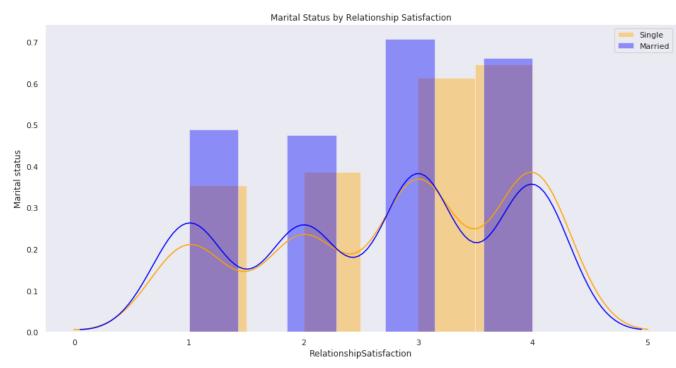




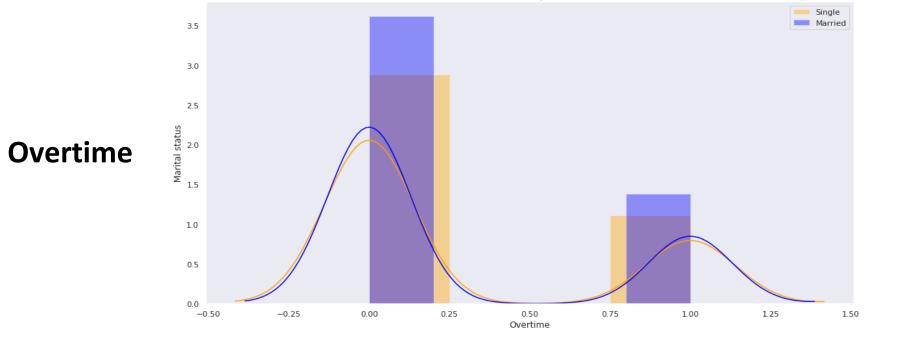
Relationship Satisfaction



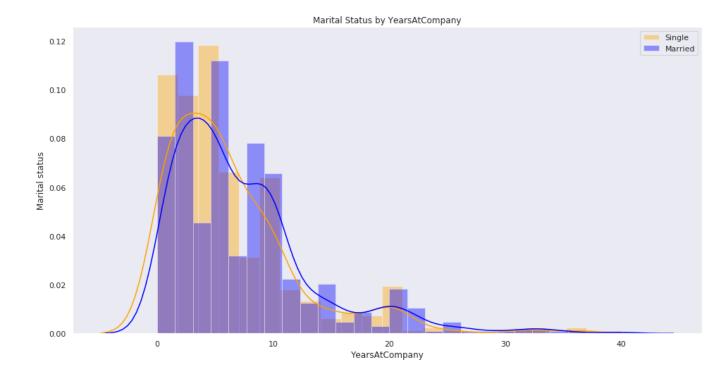
Work-Life Balance







Years At Company



ANOVA

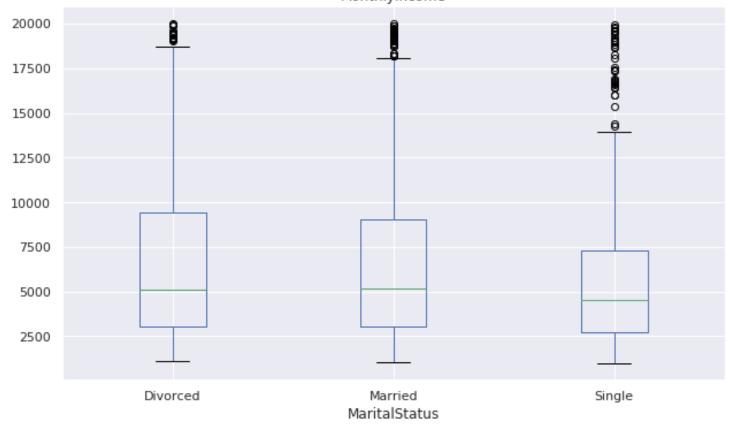
F_onewayResult(Statistic=5.9, pvalue=0.00279)

 Are there significant differences in means between the single vs married with respect to monthly income?

Observations

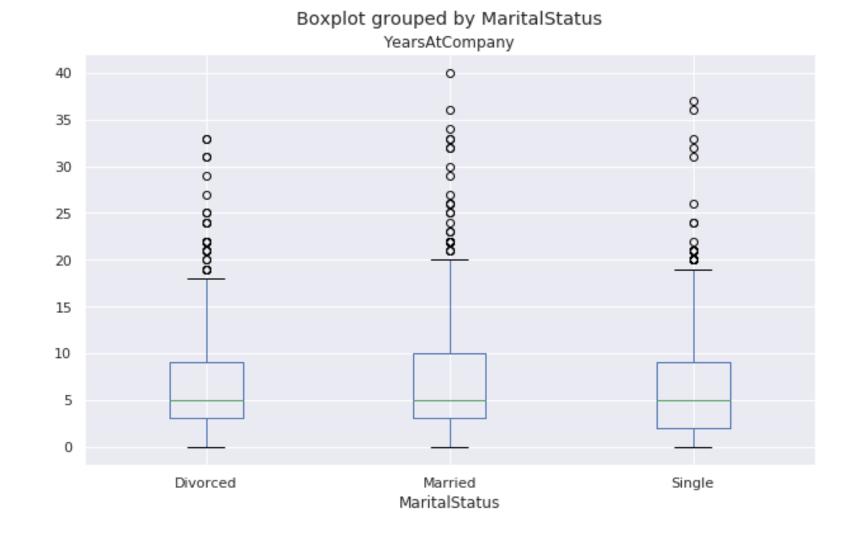
CONTRIBUTING FACTORS Monthly Income Percent Salary Hike Years at company

Boxplot grouped by MaritalStatus MonthlyIncome



Observations

Generally, people at the married status appeared to slightly have worked more years.



Conclusion and Recommendations

- Indeed Attrition Rate is higher among single vs married populations.
- Statistically significant differences in means between the 2 groups.
- Difference in attrition rate inadvertently related to other factors like years spent at company, salary increase, monthly income.
- Good example of a case where taking results at face value without digging into underlying statistics may be misleading.

Thanks

谢谢

Gracias