SIT384 Cyber security analytics

Pass Task 4.1P: Visualize data using matplotlib

Task description:

Cyber security attacks can be classified into 4 categories: DOS attack, PROBE attack, R2l attack, and U2R attack.

In file “attack-type-frequency.csv”, you can find how many attack types in each category. E.g. there are 11 attack types for DOS.

Attack_type	category	number_of_attack	frequency
apache2	dos	124	0.52
back	dos	432	1.8
mailbomb	dos	2563	10.68
processtable	dos	567	2.36
snmpgetattack	dos	88	0.37
teardrop	dos	312	1.3
smurf	dos	359	1.5
land	dos	82	0.34
neptune	dos	55	0.23
pod	dos	43	0.18
udpstorm	dos	96	0.4
ps	u2r	482	2.01
buffer_overflow	u2r	2625	10.93
perl	u2r	954	3.97
rootkit	u2r	679	2.83

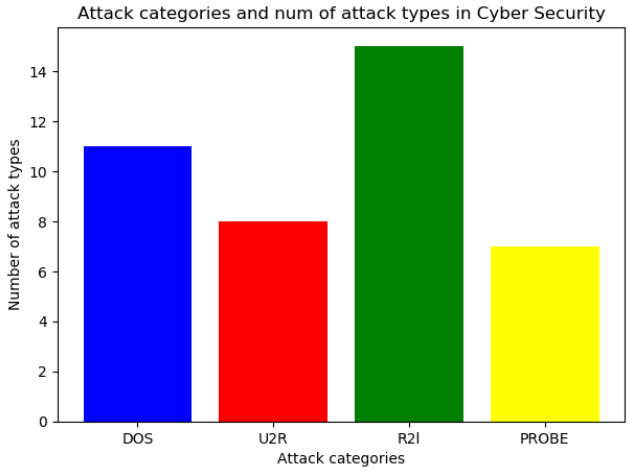
(The above data is for demonstration purposes only. Please download the full version of attack-type-frequency.csv)

You are asked to read the file data, **count** the number of attack types and number of attacks in each category and visualize the data using matplotlib’s bar chart and pie chart: (hints: use dataframe. DO NOT hard code the type numbers and attack numbers.)

Bar chart with the following settings:

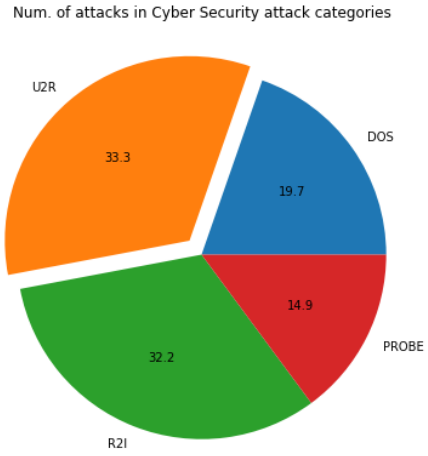
- pd.read_csv('file_name', index_col=0, engine='python')
- figsize=(7,5), dpi=100
- colors = ['blue', 'red', 'green', 'yellow'] for DOS, U2R, R2l and PROBE, respectively. Or you choose your preferred colors.
- labels: ['DOS', 'U2R', 'R2l', 'PROBE']
- X axis label: Attack categories
- Y axis label: Number of attack types in each category
- title: Attack categories and num of attack types in Cyber Security

Sample output as shown in the following figure is for demonstration purposes only.



Pie chart with the following settings:

- figsize=(10, 10)
- labels: ['DOS', 'U2R', 'R2l', 'PROBE']
- data: number_of_attack per category
- explode: explode the largest number by 0.1.
- title: Attack categories and num of attacks in Cyber Security



Submission:

Submit the following files to OnTrack:

1. Your program source code (e.g. task4-1.py)
2. A screen shot of your program running

Check the following things before submitting:

1. Add proper comments to your code