

# My PetStore Data Analysis Project

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CPS 3320\*16

## TASK 1:

```
OUTPUT PROBLEMS PORTS TERMINAL DEBUG CONSOLE

• safia@Safias-Air Pet Project % python3 pet.py
Missing values per column:
140      0
Unnamed: 1  0
Unnamed: 2  0
Unnamed: 3  0
Unnamed: 4  0
dtype: int64

Missing values details:
Series([], dtype: int64)

DataFrame before filling missing values:
   140 Unnamed: 1  Unnamed: 2  Unnamed: 3      Unnamed: 4
Luna  2/14/2020    57.81        Bird       flies
Simba 1/8/2022     36.23      Reptile  cold-blooded
Max   7/17/2021    46.94  Small Animal      yes
Ginger 11/21/2018   181.16        Dog      Foxhound
Shadow 3/12/2022    52.72        Cat      Burmilla
Charlie 9/2/2019   163.06  Small Animal      yes
Bella  6/5/2019    43.02        Rabbit      no
Lucky  2/1/2022    145.88  Small Animal      yes
Oliver 12/7/2020    85.52        Cat      Cymric
Daisy  1/15/2023    9.47        Rabbit      no
Rocky  12/27/2018   107.71      Reptile      warm
Molly  4/19/2021   84.87  Small Animal      yes
Tucker 2/14/2023   30.01        Cat      Korat
Lucy  7/28/2020    121.19        Rabbit      no
Leo   11/6/2022    59.33  Small Animal      yes
Sadio  5/22/2019   42.22      Reptile      warm
Coco   12/4/2018   129.60        Cat      Siberian Forest
Buddy  5/11/2020    80.43  Small Animal      yes
Daisy  1/3/2022    77.96        Bird      walks
Pepper 8/29/2022   108.48        Rabbit      yes
Zeus   6/19/2020    70.92        Dog      Havaneise
Baloo  5/27/2021   96.55        Bird       flies
Ruby  12/28/2022   180.27        Rabbit      no
Thor   3/28/2023   150.20  Small Animal      yes
Rosie 10/14/2018   94.70      Reptile      warm
Bandit 1/31/2019   101.44  Small Animal      yes
Chloe  1/23/2020   137.74        Cat      Dragon Li
Duke   5/7/2021    117.52        Rabbit      yes
Maggie 3/28/2023   22.81        Dog      Keeshond
Milo   9/12/2018   19.76  Small Animal      yes
Ginger 8/8/2020    29.17      Reptile      warm
Blue   9/16/2021   53.06  Small Animal      yes
Lola   7/21/2019   39.19        Rabbit      yes
Harley 7/1/2022    133.89        Cat      Peterbald
Abby   9/19/2020   160.15  Small Animal      yes
Finn   4/2/2023    88.10        Bird      walks
Roxy  5/10/2022   121.56  Small Animal      yes
Winston 12/14/2018  25.44      Reptile      warm
Mia   4/1/2019    78.83        Rabbit      no
Bear   10/30/2021   137.12      Cat Colorpoint Shorthair
Stella 1/2/2023   40.95  Small Animal      yes
Jack   4/27/2020   73.57        Dog      Dalmatian
Nala   9/11/2022   60.23        Rabbit      yes
Rusty  6/24/2019   137.79  Small Animal      yes
Gatsby  11/1/2018  140.63      Reptile  cold-blooded
Koda   2/18/2021   111.36  Small Animal      yes
Marley 1/28/2023   31.76        Cat      Selkirk Rex
Gigi   2/14/2019   152.37        Rabbit      yes
Samson 11/11/2022   129.66  Small Animal      yes
Phoebe 6/8/2022    45.08        Bird      walks
Baxter 10/3/2018   83.01        Rabbit      no
Cisco  6/23/2021   127.47  Small Animal      yes
Bruno  11/17/2019  83.63        Dog      Collie
Luna   4/4/2022   189.10        Cat      Highlander
Zeus   2/7/2023   53.14  Small Animal      yes
Jasper 2/23/2020   86.02      Reptile  cold-blooded
Poppy  1/11/2021   17.36  Small Animal      yes
Cleo  9/24/2018   109.97        Rabbit      yes
Zeus   1/25/2022   56.38        Cat      Sokoke
Sadie  7/9/2020   18.83        Bird       flies
Mimi   3/24/2021   147.15  Small Animal      no
Max   9/16/2019   136.24      Reptile      warm
Taz   3/6/2023    74.33        Rabbit      yes
Poppy 11/19/2022   87.60        Dog      Chow Chow
Sashy  12/9/2018   56.94  Small Animal      yes
Lulu   5/25/2020   37.72        Cat      Javanese
Thor   11/3/2021   98.18        Bird       flies
Peanut 5/18/2019   60.44  Small Animal      no
Oscar  8/13/2022   106.46        Rabbit      no
Piper  9/1/2020   179.24      Reptile  cold-blooded
Luna  2/14/2020   152.53        Cat      Kurilian Bobtail
Simba 1/8/2022   55.69  Small Animal      yes
Max   7/17/2021   82.38      Reptile      warm
Ginger 11/21/2018  198.25        Bird      walks
Shadow 3/12/2022   61.67        Rabbit      yes
Charlie 9/2/2019   144.10  Small Animal      no
Bella  6/5/2019   97.36        Dog      Basenji
Lucky  2/1/2022   144.87  Small Animal      no
Oliver 12/17/2020   57.67        Rabbit      no
Daisy  1/15/2023   82.79      Reptile  cold-blooded
Rocky  12/27/2018   88.67  Small Animal      yes
Molly  4/19/2021   143.48        Bird      walks
Tucker 2/14/2023   75.03  Small Animal      no
```

OUTPUT	PROBLEMS	PORTS	TERMINAL	DEBUG CONSOLE
Lucy	7/28/2020	133.89	Cat	American Curl
Leo	11/6/2022	19.90	Rabbit	yes
Sadie	5/22/2019	135.08	Reptile	cold-blooded
Coco	12/4/2018	114.53	Small Animal	yes
Buddy	5/11/2020	115.72	Dog	Afghan Hound
Pepper	3/9/2021	125.88	Small Animal	no
Zeus	8/29/2022	123.09	Rabbit	yes
Bailey	6/10/2020	38.62	Cat	Tiffany
Ruby	12/2/2021	181.41	Small Animal	yes
Thor	12/20/2022	110.49	Reptile	cold-blooded
Rosie	3/28/2023	71.60	Small Animal	yes
Bandit	10/14/2018	94.17	Bird	flies
Chloe	1/31/2019	177.52	Rabbit	no
Duke	1/23/2020	132.52	Small Animal	yes
Maggie	5/7/2021	39.33	Dog	Scottish Terrier
Milo	3/20/2023	81.05	Cat	Khao Manee
Blue	9/12/2018	30.69	Small Animal	yes
Lola	8/8/2020	86.05	Reptile	warm
Harley	9/16/2021	120.53	Rabbit	yes
Abby	7/21/2019	34.60	Small Animal	yes
Finn	7/1/2022	59.41	Bird	walks
Roxy	9/19/2020	48.81	Small Animal	yes
Winston	4/2/2023	64.76	Rabbit	no
Mia	5/10/2022	57.81	Reptile	warm
Bear	12/14/2018	36.23	Small Animal	yes
Stella	4/1/2019	46.94	Cat	Oriental Shorthair
Jack	10/30/2021	181.16	Small Animal	yes
Nala	1/2/2023	52.72	Dog	Lhasa Apso
Rusty	4/27/2020	163.06	Small Animal	yes
Gatsby	9/11/2022	43.02	Rabbit	yes
Koda	6/24/2019	145.88	Reptile	cold-blooded
Marley	11/1/2018	85.52	Small Animal	yes
Gigi	2/18/2021	9.47	Cat	Siberian
Samson	1/28/2023	107.71	Small Animal	yes
Phoebe	2/14/2019	84.87	Bird	flies
Baxter	11/11/2020	30.01	Rabbit	no
Cleo	6/8/2022	121.19	Small Animal	yes
Bruno	10/3/2018	59.33	Reptile	warm
Luna	6/23/2021	42.22	Small Animal	yes
Zeus	11/17/2019	129.60	Cat	Toyger
Jasper	4/4/2022	80.43	Rabbit	yes
Poppy	2/7/2023	77.96	Small Animal	yes
Cleo	2/23/2020	108.48	Dog	Bloodhound
Zeus	1/11/2021	70.92	Small Animal	yes
Sadie	9/24/2018	96.55	Reptile	warm
Mimi	1/25/2022	180.27	Small Animal	yes
Max	7/9/2020	150.20	Rabbit	no
Taz	3/24/2021	94.70	Bird	walks
Poppy	9/16/2019	101.44	Small Animal	yes
Sasha	3/6/2023	137.74	Cat	Aegean
Lulu	11/19/2022	117.52	Reptile	cold-blooded
Thor	12/9/2018	22.81	Small Animal	yes
Peanut	5/25/2020	19.76	Rabbit	yes
Oscar	11/3/2021	29.17	Small Animal	yes
Piper	5/10/2019	53.06	Dog	English Mastiff
Shadow	8/13/2022	39.19	Small Animal	yes
Bella	9/1/2020	133.89	Bird	walks

Cleaned DataFrame:

PetID	Name	Birthdate	Price	Species	SpecialFeature
0	Luna	2/14/2020	57.81	Bird	flies
1	Simba	1/8/2022	36.23	Reptile	cold-blooded
2	Max	7/17/2021	46.94	Small Animal	yes
3	Ginger	11/21/2018	181.16	Dog	Foxhound
4	Shadow	3/12/2022	52.72	Cat	Burmilla
5	Charlie	9/2/2019	163.06	Small Animal	yes
6	Bella	6/5/2019	43.02	Rabbit	no
7	Lucky	2/1/2022	145.88	Small Animal	yes
8	Oliver	12/7/2020	85.52	Cat	Cymric
9	Daisy	1/15/2023	9.47	Rabbit	no
10	Rocky	12/27/2018	107.71	Reptile	warm
11	Molly	4/19/2021	84.87	Small Animal	yes
12	Tucker	2/14/2023	30.01	Cat	Korat
13	Lucy	7/28/2020	121.19	Rabbit	no
14	Leo	11/6/2022	59.33	Small Animal	yes
15	Sadie	5/22/2019	42.22	Reptile	warm
16	Coco	12/4/2018	129.60	Cat	Siberian Forest Cat
17	Buddy	5/11/2020	80.43	Small Animal	yes
18	Daisy	3/9/2021	77.96	Bird	walks
19	Pepper	8/29/2022	108.48	Rabbit	yes
20	Zeus	6/10/2020	70.92	Dog	Havanese
21	Bailey	12/2/2021	96.55	Bird	flies
22	Ruby	12/20/2022	180.27	Rabbit	no
23	Thor	3/28/2023	150.20	Small Animal	yes
24	Rosie	10/14/2018	94.70	Reptile	warm
25	Bandit	1/31/2019	101.44	Small Animal	yes
26	Chloe	1/23/2020	137.74	Cat	Dragon Li
27	Duke	5/7/2021	117.52	Rabbit	yes
28	Maggie	3/20/2023	22.81	Dog	Keeshond
29	Milo	9/12/2018	19.76	Small Animal	yes
30	Ginger	8/8/2020	29.17	Reptile	warm
31	Blue	9/16/2021	53.06	Small Animal	yes
32	Lola	7/21/2019	39.19	Rabbit	yes
33	Harley	7/1/2022	133.89	Cat	Peterbald
34	Abby	9/19/2020	160.15	Small Animal	yes
35	Finn	4/2/2023	88.10	Bird	walks
36	Roxy	5/10/2022	121.56	Small Animal	yes

OUTPUT	PROBLEMS	PORTS	TERMINAL	DEBUG CONSOLE
37 Winston	12/14/2018	25.44	Reptile	warm
38 Mia	4/1/2019	78.83	Rabbit	no
39 Bear	10/30/2021	137.12	Cat	Colorpoint Shorthair
40 Stella	1/2/2023	40.95	Small Animal	yes
41 Jack	4/27/2020	73.57	Dog	Dalmatian
42 Nala	9/11/2022	60.23	Rabbit	yes
43 Rusty	6/24/2019	137.79	Small Animal	cold-blooded
44 Gatsby	11/1/2018	140.63	Reptile	yes
45 Koda	2/18/2021	111.36	Small Animal	yes
46 Marley	1/28/2023	31.76	Cat	Selkirk Rex
47 Gigi	2/14/2019	152.37	Rabbit	yes
48 Samson	11/11/2020	129.66	Small Animal	yes
49 Phoebe	6/8/2022	45.08	Bird	walks
50 Baxter	10/3/2018	83.01	Rabbit	no
51 Cleo	6/23/2021	127.47	Small Animal	yes
52 Bruno	11/17/2019	83.63	Dog	Collie
53 Luna	4/4/2022	159.10	Cat	Highlander
54 Zeus	2/7/2023	53.14	Small Animal	yes
55 Jasper	2/23/2020	86.02	Reptile	cold-blooded
56 Poppy	1/11/2021	17.36	Small Animal	yes
57 Cleo	9/24/2018	109.97	Rabbit	yes
58 Zeus	1/25/2022	56.38	Cat	Sokoke
59 Sadie	7/9/2020	18.83	Bird	flies
60 Mimi	3/24/2021	147.15	Small Animal	no
61 Max	9/16/2019	136.24	Reptile	warm
62 Taz	3/6/2023	74.33	Rabbit	yes
63 Poppy	11/19/2022	87.60	Dog	Chow Chow
64 Sasha	12/9/2018	56.94	Small Animal	yes
65 Lulu	5/25/2020	37.72	Cat	Javanese
66 Thor	11/3/2021	98.18	Bird	flies
67 Peanut	5/10/2019	60.44	Small Animal	no
68 Oscar	8/13/2022	106.46	Rabbit	no
69 Piper	9/1/2020	179.24	Reptile	cold-blooded
70 Luna	2/14/2020	152.53	Cat	Kurilian Bobtail
71 Simba	1/8/2022	55.69	Small Animal	yes
72 Max	7/17/2021	82.38	Reptile	warm
73 Ginger	11/21/2018	198.25	Bird	walks
74 Shadow	3/12/2022	61.67	Rabbit	yes
75 Charlie	9/2/2019	144.10	Small Animal	no
76 Bella	6/5/2019	97.36	Dog	Basenji
77 Lucky	2/1/2022	144.87	Small Animal	no
78 Oliver	12/7/2020	57.67	Rabbit	no
79 Daisy	1/15/2023	82.79	Reptile	cold-blooded
80 Rocky	12/27/2018	88.67	Small Animal	yes
81 Molly	4/19/2021	143.48	Bird	walks
82 Tucker	2/14/2023	75.03	Small Animal	no
83 Lucy	7/28/2020	133.89	Cat	American Curl
84 Leo	11/6/2022	19.90	Rabbit	yes
85 Sadie	5/22/2019	135.08	Reptile	cold-blooded
86 Coco	12/4/2018	114.53	Small Animal	yes
87 Buddy	5/11/2020	115.72	Dog	Afghan Hound
88 Pepper	3/9/2021	125.88	Small Animal	no
89 Zeus	8/29/2022	123.09	Rabbit	yes
90 Bailey	6/10/2020	38.62	Cat	Tiffany
91 Ruby	12/2/2021	181.41	Small Animal	yes
92 Thor	12/20/2022	110.49	Reptile	cold-blooded
93 Rosie	3/28/2023	71.60	Small Animal	yes
94 Bandit	10/14/2018	94.17	Bird	flies
95 Chloe	1/31/2019	177.52	Rabbit	no
96 Duke	1/23/2020	132.52	Small Animal	yes
97 Maggie	5/7/2021	39.33	Dog	Scottish Terrier
98 Milo	3/20/2023	81.05	Cat	Khao Manee
99 Blue	9/12/2018	30.69	Small Animal	yes
100 Lola	8/8/2020	86.05	Reptile	warm
101 Harley	9/16/2021	120.53	Rabbit	yes
102 Abby	7/21/2019	34.60	Small Animal	yes
103 Finn	7/1/2022	59.41	Bird	walks
104 Roxy	9/19/2020	48.81	Small Animal	yes
105 Winston	4/2/2023	64.76	Rabbit	no
106 Mia	5/10/2022	57.81	Reptile	warm
107 Bear	12/14/2018	36.23	Small Animal	yes
108 Stella	4/1/2019	46.94	Cat	Oriental Shorthair
109 Jack	10/30/2021	181.16	Small Animal	yes
110 Nala	1/2/2023	52.72	Dog	Lhasa Apso
111 Rusty	4/27/2020	163.06	Small Animal	yes
112 Gatsby	9/11/2022	43.02	Rabbit	yes
113 Koda	6/24/2019	145.88	Reptile	cold-blooded
114 Marley	11/1/2018	85.52	Small Animal	yes
115 Gigi	2/18/2021	9.47	Cat	Siberian
116 Samson	1/28/2023	107.71	Small Animal	yes
117 Phoebe	2/14/2019	84.87	Bird	flies
118 Baxter	11/11/2020	30.01	Rabbit	no
119 Cleo	6/8/2022	121.19	Small Animal	yes
120 Bruno	10/3/2018	59.33	Reptile	warm
121 Luna	6/23/2021	42.22	Small Animal	yes
122 Zeus	11/17/2019	129.60	Cat	Toyger
123 Jasper	4/4/2022	80.43	Rabbit	yes
124 Poppy	2/7/2023	77.96	Small Animal	yes
125 Cleo	2/23/2020	108.48	Dog	Bloodhound
126 Zeus	1/11/2021	70.92	Small Animal	yes
127 Sadie	9/24/2018	96.55	Reptile	warm
128 Mimi	1/25/2022	180.27	Small Animal	yes
129 Max	7/9/2020	150.20	Rabbit	no
130 Taz	3/24/2021	94.70	Bird	walks
131 Poppy	9/16/2019	101.44	Small Animal	yes
132 Sasha	3/6/2023	137.74	Cat	Aegean
133 Lulu	11/19/2022	117.52	Reptile	cold-blooded

OUTPUT	PROBLEMS	PORTS	<u>TERMINAL</u>	DEBUG CONSOLE	
134	Thor	12/9/2018	22.81	Small Animal	yes
135	Peanut	5/25/2020	19.76	Rabbit	yes
136	Oscar	11/3/2021	29.17	Small Animal	yes
137	Piper	5/10/2019	53.06	Dog	English Mastiff
138	Shadow	8/13/2022	39.19	Small Animal	yes
139	Bella	9/1/2020	133.89	Bird	walks

○ safia@Safias-Air Pet Project % █

# TASK 2

OUTPUT PROBLEMS PORTS TERMINAL DEBUG CONSOLE

```
/dev/fd/13:18: command not found: compdef
● safia@Safias-Air ~ Pet Project % python3 pet.py
Missing values per column:
140      0
Unnamed: 1  0
Unnamed: 2  0
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dtype: int64

Missing values details:
Series([], dtype: int64)

DataFrame before filling missing values:
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Ginger 11/21/2018  181.16     Dog Foxhound
Shadow 3/12/2022    52.72     Cat Burmilla
Charlie 9/2/2019   163.06 Small Animal   yes
Bella  6/5/2019    43.02     Rabbit  no
Lucky  2/1/2022   145.88 Small Animal   yes
Oliver 12/7/2020    85.52     Cat Cymric
Daisy  1/15/2023    9.47      Rabbit  no
Rocky  12/27/2018  107.71    Reptile warm
Molly  4/19/2021   84.87 Small Animal   yes
Tucker 2/14/2023   30.01      Cat Korat
Lucy   7/28/2020   121.19     Rabbit  no
Leo    11/6/2022    59.33 Small Animal   yes
Sadie  5/22/2019   42.22    Reptile warm
Coco   12/4/2018   129.60     Cat Siberian Forest Cat
Buddy  5/11/2020    80.43 Small Animal   yes
Daisy  3/9/2021    77.96     Bird walks
Pepper 8/29/2022   108.48     Rabbit  yes
Zeus   6/10/2020   70.92      Dog Havanese
Bailey 12/2/2021   96.55     Bird flies
Ruby  12/20/2022  180.27     Rabbit  no
Thor   3/28/2023   150.20 Small Animal   yes
Rosie 10/14/2018   94.70    Reptile warm
Bandit 1/31/2019   101.44 Small Animal   yes
Chloe  1/23/2020   137.74     Cat Dragon Li
Duke   5/7/2021    117.52     Rabbit  yes
Maggie 3/28/2023   22.81      Dog Keeshond
Milo   9/12/2018   19.76 Small Animal   yes
Ginger 8/8/2020    29.17    Reptile warm
Blue   9/16/2021   53.06 Small Animal   yes
Lola   7/21/2019   39.19     Rabbit  yes
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Taz   3/6/2023    74.33     Rabbit  yes
Poppy 11/19/2022   87.60      Dog Chow Chow
Sasha 12/9/2018   56.94 Small Animal   yes
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Thor  11/3/2021   98.18     Bird flies
Peanut 5/10/2019   60.44 Small Animal   no
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Blue	9/12/2018	30.69	Small Animal	yes
Lola	8/8/2020	86.05	Reptile	warm
Harley	9/16/2021	120.53	Rabbit	yes
Abby	7/21/2019	34.60	Small Animal	yes
Finn	7/1/2022	59.41	Bird	walks
Roxy	9/19/2020	48.81	Small Animal	yes
Winston	4/2/2023	64.76	Rabbit	no
Mia	5/10/2022	57.81	Reptile	warm
Bear	12/14/2018	36.23	Small Animal	yes
Stella	4/1/2019	46.94	Cat	Oriental Shorthair
Jack	10/30/2021	181.16	Small Animal	yes
Nala	1/2/2023	52.72	Dog	Lhasa Apso
Rusty	4/27/2020	163.06	Small Animal	yes
Gatsby	9/11/2022	43.02	Rabbit	yes
Koda	6/24/2019	145.88	Reptile	cold-blooded
Marley	11/1/2018	85.52	Small Animal	yes
Gigi	2/18/2021	9.47	Cat	Siberian
Samson	1/28/2023	107.71	Small Animal	yes
Phoebe	2/14/2019	84.87	Bird	flies
Baxter	11/11/2020	30.01	Rabbit	no
Cleo	6/8/2022	121.19	Small Animal	yes
Bruno	10/3/2018	59.33	Reptile	warm
Luna	6/23/2021	42.22	Small Animal	yes
Zeus	11/17/2019	129.60	Cat	Toyger
Jasper	4/4/2022	80.43	Rabbit	yes
Poppy	2/7/2023	77.96	Small Animal	yes
Cleo	2/23/2020	108.48	Dog	Bloodhound
Zeus	1/11/2021	70.92	Small Animal	yes
Sadie	9/24/2018	96.55	Reptile	warm
Mimi	1/25/2022	180.27	Small Animal	yes
Max	7/9/2020	150.20	Rabbit	no
Taz	3/24/2021	94.70	Bird	walks
Poppy	9/16/2019	101.44	Small Animal	yes
Sasha	3/6/2023	137.74	Cat	Aegean
Lulu	11/19/2022	117.52	Reptile	cold-blooded
Thor	12/9/2018	22.81	Small Animal	yes
Peanut	5/25/2020	19.76	Rabbit	yes
Oscar	11/3/2021	29.17	Small Animal	yes
Piper	5/10/2019	53.06	Dog	English Mastiff
Shadow	8/13/2022	39.19	Small Animal	yes
Bella	9/1/2020	133.89	Bird	walks

Cleaned DataFrame:

PetID	Name	Birthdate	Price	Species	SpecialFeature
0	Luna	2/14/2020	57.81	Bird	flies
1	Simba	1/8/2022	36.23	Reptile	cold-blooded
2	Max	7/17/2021	46.94	Small Animal	yes
3	Ginger	11/21/2018	181.16	Dog	Foxhound
4	Shadow	3/12/2022	52.72	Cat	Burmilla
5	Charlie	9/2/2019	163.06	Small Animal	yes
6	Bella	6/5/2019	43.02	Rabbit	no
7	Lucky	2/1/2022	145.88	Small Animal	yes
8	Oliver	12/7/2020	85.52	Cat	Cymric
9	Daisy	1/15/2023	9.47	Rabbit	no
10	Rocky	12/27/2018	107.71	Reptile	warm
11	Molly	4/19/2021	84.87	Small Animal	yes
12	Tucker	2/14/2023	30.01	Cat	Korat
13	Lucy	7/28/2020	121.19	Rabbit	no
14	Leo	11/6/2022	59.33	Small Animal	yes
15	Sadie	5/22/2019	42.22	Reptile	warm
16	Coco	12/4/2018	129.60	Cat	Siberian Forest Cat
17	Buddy	5/11/2020	80.43	Small Animal	yes
18	Daisy	3/9/2021	77.96	Bird	walks
19	Pepper	8/29/2022	108.48	Rabbit	yes
20	Zeus	6/10/2020	70.92	Dog	Havanese
21	Bailey	12/2/2021	96.55	Bird	flies
22	Ruby	12/20/2022	180.27	Rabbit	no
23	Thor	3/28/2023	150.20	Small Animal	yes
24	Rosie	10/14/2018	94.70	Reptile	warm
25	Bandit	1/31/2019	101.44	Small Animal	yes
26	Chloe	1/23/2020	137.74	Cat	Dragon Li
27	Duke	5/7/2021	117.52	Rabbit	yes
28	Maggie	3/20/2023	22.81	Dog	Keeshond
29	Milo	9/12/2018	19.76	Small Animal	yes
30	Ginger	8/8/2020	29.17	Reptile	warm
31	Blue	9/16/2021	53.06	Small Animal	yes
32	Lola	7/21/2019	39.19	Rabbit	yes
33	Harley	7/1/2022	133.89	Cat	Peterbald
34	Abby	9/19/2020	160.15	Small Animal	yes
35	Finn	4/2/2023	88.10	Bird	walks

OUTPUT PROBLEMS PORTS TERMINAL DEBUG CONSOLE

36	Roxy	5/10/2022	121.56	Small Animal	yes
37	Winston	12/14/2018	25.44	Reptile	warm
38	Mia	4/1/2019	78.83	Rabbit	no
39	Bear	10/30/2021	137.12	Cat	Colorpoint Shorthair
40	Stella	1/2/2023	40.95	Small Animal	yes
41	Jack	4/27/2020	73.57	Dog	Dalmatian
42	Nala	9/11/2022	60.23	Rabbit	yes
43	Rusty	6/24/2019	137.79	Small Animal	yes
44	Gatsby	11/1/2018	140.63	Reptile	cold-blooded
45	Koda	2/18/2021	111.36	Small Animal	yes
46	Marley	1/28/2023	31.76	Cat	Selkirk Rex
47	Gigi	2/14/2019	152.37	Rabbit	yes
48	Samson	11/11/2020	129.66	Small Animal	yes
49	Phoebe	6/8/2022	45.08	Bird	walks
50	Baxter	10/3/2018	83.01	Rabbit	no
51	Cleo	6/23/2021	127.47	Small Animal	yes
52	Bruno	11/17/2019	83.63	Dog	Collie
53	Luna	4/4/2022	159.10	Cat	Highlander
54	Zeus	2/7/2023	53.14	Small Animal	yes
55	Jasper	2/23/2020	86.02	Reptile	cold-blooded
56	Poppy	1/11/2021	17.36	Small Animal	yes
57	Cleo	9/24/2018	109.97	Rabbit	yes
58	Zeus	1/25/2022	56.38	Cat	Sokoke
59	Sadie	7/9/2020	18.83	Bird	flies
60	Mimi	3/24/2021	147.15	Small Animal	no
61	Max	9/16/2019	136.24	Reptile	warm
62	Taz	3/6/2023	74.33	Rabbit	yes
63	Poppy	11/19/2022	87.60	Dog	Chow Chow
64	Sasha	12/9/2018	56.94	Small Animal	yes
65	Lulu	5/25/2020	37.72	Cat	Javanese
66	Thor	11/3/2021	98.18	Bird	flies
67	Peanut	5/10/2019	60.44	Small Animal	no
68	Oscar	8/13/2022	106.46	Rabbit	no
69	Piper	9/1/2020	179.24	Reptile	cold-blooded
70	Luna	2/14/2020	152.53	Cat	Kurilian Bobtail
71	Simba	1/8/2022	55.69	Small Animal	yes
72	Max	7/17/2021	82.38	Reptile	warm
73	Ginger	11/21/2018	198.25	Bird	walks
74	Shadow	3/12/2022	61.67	Rabbit	yes
75	Charlie	9/2/2019	144.10	Small Animal	no
76	Bella	6/5/2019	97.36	Dog	Basenji
77	Lucky	2/1/2022	144.87	Small Animal	no
78	Oliver	12/7/2020	57.67	Rabbit	no
79	Daisy	1/15/2023	82.79	Reptile	cold-blooded
80	Rocky	12/27/2018	88.67	Small Animal	yes
81	Molly	4/19/2021	143.48	Bird	walks
82	Tucker	2/14/2023	75.03	Small Animal	no
83	Lucy	7/28/2020	133.89	Cat	American Curl
84	Leo	11/6/2022	19.90	Rabbit	yes
85	Sadie	5/22/2019	135.08	Reptile	cold-blooded
86	Coco	12/4/2018	114.53	Small Animal	yes
87	Buddy	5/11/2020	115.72	Dog	Afghan Hound
88	Pepper	3/9/2021	125.88	Small Animal	no
89	Zeus	8/29/2022	123.09	Rabbit	yes
90	Bailey	6/10/2020	38.62	Cat	Tiffany
91	Ruby	12/2/2021	181.41	Small Animal	yes
92	Thor	12/20/2022	110.49	Reptile	cold-blooded
93	Rosie	3/28/2023	71.60	Small Animal	yes
94	Bandit	10/14/2018	94.17	Bird	flies
95	Chloe	1/31/2019	177.52	Rabbit	no
96	Duke	1/23/2020	132.52	Small Animal	yes
97	Maggie	5/7/2021	39.33	Dog	Scottish Terrier
98	Milo	3/20/2023	81.05	Cat	Khao Manee
99	Blue	9/12/2018	30.69	Small Animal	yes
100	Lola	8/8/2020	86.05	Reptile	warm
101	Harley	9/16/2021	120.53	Rabbit	yes
102	Abby	7/21/2019	34.60	Small Animal	yes
103	Finn	7/1/2022	59.41	Bird	walks
104	Roxy	9/19/2020	48.81	Small Animal	yes
105	Winston	4/2/2023	64.76	Rabbit	no
106	Mia	5/10/2022	57.81	Reptile	warm
107	Bear	12/14/2018	36.23	Small Animal	yes
108	Stella	4/1/2019	46.94	Cat	Oriental Shorthair
109	Jack	10/30/2021	181.16	Small Animal	yes
110	Nala	1/2/2023	52.72	Dog	Lhasa Apso
111	Rusty	4/27/2020	163.06	Small Animal	yes
112	Gatsby	9/11/2022	43.02	Rabbit	yes
113	Koda	6/24/2019	145.88	Reptile	cold-blooded
114	Marley	11/1/2018	85.52	Small Animal	yes
115	Gigi	2/18/2021	9.47	Cat	Siberian
116	Samson	1/28/2023	107.71	Small Animal	yes
117	Phoebe	2/14/2019	84.87	Bird	flies
118	Baxter	11/11/2020	30.01	Rabbit	no
119	Cleo	6/8/2022	121.19	Small Animal	yes
120	Bruno	10/3/2018	59.33	Reptile	warm
121	Luna	6/23/2021	42.22	Small Animal	yes
122	Zeus	11/17/2019	129.60	Cat	Toyger
123	Jasper	4/4/2022	80.43	Rabbit	yes
124	Poppy	2/7/2023	77.96	Small Animal	yes
125	Cleo	2/23/2020	108.48	Dog	Bloodhound
126	Zeus	1/11/2021	70.92	Small Animal	yes
127	Sadie	9/24/2018	96.55	Reptile	warm
128	Mimi	1/25/2022	180.27	Small Animal	yes
129	Max	7/9/2020	150.20	Rabbit	no
130	Taz	3/24/2021	94.70	Bird	walks
131	Poppy	9/16/2019	101.44	Small Animal	yes
132	Sasha	3/6/2023	137.74	Cat	Aegean

OUTPUT	PROBLEMS	PORTS	<u>TERMINAL</u>	DEBUG CONSOLE	
133	Lulu	11/19/2022	117.52	Reptile	cold-blooded
134	Thor	12/9/2018	22.81	Small Animal	yes
135	Peanut	5/25/2020	19.76	Rabbit	yes
136	Oscar	11/3/2021	29.17	Small Animal	yes
137	Piper	5/10/2019	53.06	Dog	English Mastiff
138	Shadow	8/13/2022	39.19	Small Animal	yes
139	Bella	9/1/2020	133.89	Bird	walks

Average price of Rabbit: \$85.88

Names of pets with special feature 'flies': Luna, Bailey, Sadie, Thor, Bandit, Phoebe  
 safia@Safias-Air Pet Project % █

## HERE'S THE CROPPED VERSION SPECIFICALLY FOR TASK 2:

OUTPUT	PROBLEMS	PORTS	<u>TERMINAL</u>	DEBUG CONSOLE	zsh + ~
Average price of Rabbit: \$85.88					
Names of pets with special feature 'flies': Luna, Bailey, Sadie, Thor, Bandit, Phoebe <input type="radio"/> safia@Safias-Air Pet Project % █					

# TASK 3

OUTPUT PROBLEMS PORTS TERMINAL DEBUG CONSOLE

```
● safia@Safias-Air Pet Project % python3 pet.py
Missing values per column:
 140      0
Unnamed: 1  0
Unnamed: 2  0
Unnamed: 3  0
Unnamed: 4  0
dtype: int64

Missing values details:
Series([], dtype: int64)

DataFrame before filling missing values:
   140 Unnamed: 1  Unnamed: 2  Unnamed: 3      Unnamed: 4
Luna  2/14/2020    57.81     Bird       flies
Simba 1/8/2022    36.23    Reptile  cold-blooded
Max   7/17/2021    46.94  Small Animal      yes
Ginger 11/21/2018  181.16     Dog     Foxhound
Shadow 3/12/2022    52.72     Cat     Burmilla
Charlie 9/2/2019   163.06  Small Animal      yes
Bella  6/5/2019    43.02     Rabbit      no
Lucky  2/1/2022   145.88  Small Animal      yes
Oliver 12/7/2020    85.52     Cat      Cymric
Daisy  1/15/2023    9.47      Rabbit      no
Rocky  12/27/2018   107.71    Reptile      warm
Molly  4/19/2021    84.87  Small Animal      yes
Tucker 2/14/2023    30.01     Cat      Korat
Lucy   7/28/2020   121.19     Rabbit      no
Leo    11/6/2022    59.33  Small Animal      yes
Sadie  5/22/2019   42.22    Reptile      warm
Coco   12/4/2018   129.60     Cat  Siberian Forest Cat
Buddy  5/11/2020    80.43  Small Animal      yes
Daisy  3/9/2021    77.96     Bird      walks
Pepper 8/29/2022   108.48     Rabbit      yes
Zeus   6/10/2020    70.92     Dog      Havanese
Bailey 12/2/2021    96.55     Bird       flies
Ruby   12/20/2022   180.27     Rabbit      no
Thor   3/28/2023   150.20  Small Animal      yes
Rosie  10/14/2018   94.70    Reptile      warm
Bandit 1/31/2019   101.44  Small Animal      yes
Chloe  1/23/2020   137.74     Cat      Dragon Li
Duke   5/7/2021    117.52     Rabbit      yes
Maggie 3/20/2023   22.81      Dog      Keeshond
Milo   9/12/2018    19.76  Small Animal      yes
Ginger 8/8/2020    29.17    Reptile      warm
Blue   9/16/2021    53.06  Small Animal      yes
Lola   7/21/2019    39.19     Rabbit      yes
Harley 7/1/2022   133.89     Cat      Peterbald
Abby   9/19/2020   160.15  Small Animal      yes
Finn   4/2/2023    88.10      Bird      walks
Roxy   5/10/2022   121.56  Small Animal      yes
Winston 12/14/2018   25.44    Reptile      warm
Mia   4/1/2019    78.83     Rabbit      no
Bear   10/30/2021   137.12     Cat Colorpoint Shorthair
Stella 1/2/2023   40.95  Small Animal      yes
Jack   4/27/2020   73.57      Dog      Dalmatian
Nala   9/11/2022   60.23     Rabbit      yes
Rusty  6/24/2019   137.79  Small Animal      yes
Gatsby 11/1/2018   140.63    Reptile  cold-blooded
Koda   2/18/2021   111.36  Small Animal      yes
Marley 1/28/2023   31.76     Cat      Selkirk Rex
Gigi   2/14/2019   152.37     Rabbit      yes
Samson 11/1/2020   129.66  Small Animal      yes
Phoebe 6/8/2022   45.08      Bird      walks
Baxter 10/3/2018   83.01     Rabbit      no
Cleo   6/23/2021   127.47  Small Animal      yes
Bruno  11/17/2019   83.63      Dog      Collie
Luna   4/4/2022   159.10     Cat      Highlander
Zeus   2/7/2023   53.14  Small Animal      yes
Jasper 2/23/2020   86.02    Reptile  cold-blooded
Poppy  1/11/2021   17.36  Small Animal      yes
Cleo   9/24/2018   109.97     Rabbit      yes
Zeus   1/25/2022   56.38     Cat      Sokoke
Sadie  7/9/2020    18.83      Bird       flies
Mimi   3/24/2021   147.15  Small Animal      no
Max   9/16/2019   136.24    Reptile      warm
Taz   3/6/2023    74.33     Rabbit      yes
Poppy 11/19/2022   87.60      Dog      Chow Chow
Sasha 12/9/2018   56.94  Small Animal      yes
Lulu  5/25/2020   37.72     Cat      Javanese
Thor   11/3/2021   98.18      Bird       flies
Peanut 5/10/2019   60.44  Small Animal      no
Oscar  8/13/2022   106.46     Rabbit      no
Piper  9/1/2020   179.24    Reptile  cold-blooded
Luna  2/14/2020   152.53     Cat      Kurilian Bobtail
Simba 1/8/2022   55.69  Small Animal      yes
Max   7/17/2021   82.38    Reptile      warm
Ginger 11/21/2018  198.25     Bird      walks
Shadow 3/12/2022   61.67     Rabbit      yes
Charlie 9/2/2019  144.10  Small Animal      no
Bella  6/5/2019   97.36      Dog      Basenji
Lucky  2/1/2022   144.87  Small Animal      no
Oliver 12/7/2020   57.67     Rabbit      no
Daisy  1/15/2023   82.79    Reptile  cold-blooded
Rocky  12/27/2018  88.67  Small Animal      yes
Molly  4/19/2021   143.48     Bird      walks
Tucker 2/14/2023   75.03  Small Animal      no
```

OUTPUT	PROBLEMS	PORTS	TERMINAL	DEBUG CONSOLE
Lucy	7/28/2020	133.89	Cat	American Curl
Leo	11/6/2022	19.90	Rabbit	yes
Sadie	5/22/2019	135.08	Reptile	cold-blooded
Coco	12/4/2018	114.53	Small Animal	yes
Buddy	5/11/2020	115.72	Dog	Afghan Hound
Pepper	3/9/2021	125.88	Small Animal	no
Zeus	8/29/2022	123.09	Rabbit	yes
Bailey	6/10/2020	38.62	Cat	Tiffany
Ruby	12/2/2021	181.41	Small Animal	yes
Thor	12/20/2022	110.49	Reptile	cold-blooded
Rosie	3/28/2023	71.60	Small Animal	yes
Bandit	10/14/2018	94.17	Bird	flies
Chloe	1/31/2019	177.52	Rabbit	no
Duke	1/23/2020	132.52	Small Animal	yes
Maggie	5/7/2021	39.33	Dog	Scottish Terrier
Milo	3/20/2023	81.05	Cat	Khao Manee
Blue	9/12/2018	30.69	Small Animal	yes
Lola	8/8/2020	86.05	Reptile	warm
Harley	9/16/2021	120.53	Rabbit	yes
Abby	7/21/2019	34.60	Small Animal	yes
Finn	7/1/2022	59.41	Bird	walks
Roxy	9/19/2020	48.81	Small Animal	yes
Winston	4/2/2023	64.76	Rabbit	no
Mia	5/10/2022	57.81	Reptile	warm
Bear	12/14/2018	36.23	Small Animal	yes
Stella	4/1/2019	46.94	Cat	Oriental Shorthair
Jack	10/30/2021	181.16	Small Animal	yes
Nala	1/2/2023	52.72	Dog	Lhasa Apsو
Rusty	4/27/2020	163.06	Small Animal	yes
Gatsby	9/11/2022	43.02	Rabbit	yes
Koda	6/24/2019	145.88	Reptile	cold-blooded
Marley	11/1/2018	85.52	Small Animal	yes
Gigi	2/18/2021	9.47	Cat	Siberian
Samson	1/28/2023	107.71	Small Animal	yes
Phoebe	2/14/2019	84.87	Bird	flies
Baxter	11/11/2020	30.01	Rabbit	no
Cleo	6/8/2022	121.19	Small Animal	yes
Bruno	10/3/2018	59.33	Reptile	warm
Luna	6/23/2021	42.22	Small Animal	yes
Zeus	11/17/2019	129.60	Cat	Toyger
Jasper	4/4/2022	80.43	Rabbit	yes
Poppy	2/7/2023	77.96	Small Animal	yes
Cleo	2/23/2020	108.48	Dog	Bloodhound
Zeus	1/11/2021	70.92	Small Animal	yes
Sadie	9/24/2018	96.55	Reptile	warm
Mimi	1/25/2022	180.27	Small Animal	yes
Max	7/9/2020	150.20	Rabbit	no
Taz	3/24/2021	94.70	Bird	walks
Poppy	9/16/2019	101.44	Small Animal	yes
Sasha	3/6/2023	137.74	Cat	Aegean
Lulu	11/19/2022	117.52	Reptile	cold-blooded
Thor	12/9/2018	22.81	Small Animal	yes
Peanut	5/25/2020	19.76	Rabbit	yes
Oscar	11/3/2021	29.17	Small Animal	yes
Piper	5/10/2019	53.06	Dog	English Mastiff
Shadow	8/13/2022	39.19	Small Animal	yes
Bella	9/1/2020	133.89	Bird	walks

Cleaned DataFrame:

PetID	Name	Birthdate	Price	Species	SpecialFeature
0	Luna	2/14/2020	57.81	Bird	flies
1	Simba	1/8/2022	36.23	Reptile	cold-blooded
2	Max	7/17/2021	46.94	Small Animal	yes
3	Ginger	11/21/2018	181.16	Dog	Foxhound
4	Shadow	3/12/2022	52.72	Cat	Burmilla
5	Charlie	9/2/2019	163.06	Small Animal	yes
6	Bella	6/5/2019	43.02	Rabbit	no
7	Lucky	2/1/2022	145.88	Small Animal	yes
8	Oliver	12/7/2020	85.52	Cat	Cymric
9	Daisy	1/15/2023	9.47	Rabbit	no
10	Rocky	12/27/2018	107.71	Reptile	warm
11	Molly	4/19/2021	84.87	Small Animal	yes
12	Tucker	2/14/2023	30.01	Cat	Korat
13	Lucy	7/28/2020	121.19	Rabbit	no
14	Leo	11/6/2022	59.33	Small Animal	yes
15	Sadie	5/22/2019	42.22	Reptile	warm
16	Coco	12/4/2018	129.60	Cat	Siberian Forest Cat
17	Buddy	5/11/2020	80.43	Small Animal	yes
18	Daisy	3/9/2021	77.96	Bird	walks
19	Pepper	8/29/2022	108.48	Rabbit	yes
20	Zeus	6/10/2020	70.92	Dog	Havanese
21	Bailey	12/2/2021	96.55	Bird	flies
22	Ruby	12/20/2022	180.27	Rabbit	no
23	Thor	3/28/2023	150.20	Small Animal	yes
24	Rosie	10/14/2018	94.70	Reptile	warm
25	Bandit	1/31/2019	101.44	Small Animal	yes
26	Chloe	1/23/2020	137.74	Cat	Dragon Li
27	Duke	5/7/2021	117.52	Rabbit	yes
28	Maggie	3/20/2023	22.81	Dog	Keeshond
29	Milo	9/12/2018	19.76	Small Animal	yes
30	Ginger	8/8/2020	29.17	Reptile	warm
31	Blue	9/16/2021	53.06	Small Animal	yes
32	Lola	7/21/2019	39.19	Rabbit	yes
33	Harley	7/1/2022	133.89	Cat	Peterbald
34	Abby	9/19/2020	160.15	Small Animal	yes
35	Finn	4/2/2023	88.10	Bird	walks
36	Roxy	5/10/2022	121.56	Small Animal	yes

OUTPUT	PROBLEMS	PORTS	TERMINAL	DEBUG CONSOLE
37	Winston	12/14/2018	25.44	Reptile warm
38	Mia	4/1/2019	78.83	Rabbit no
39	Bear	10/30/2021	137.12	Cat Colorpoint Shorthair
40	Stella	1/2/2023	40.95	Small Animal yes
41	Jack	4/27/2020	73.57	Dog Dalmatian
42	Nala	9/11/2022	60.23	Rabbit yes
43	Rusty	6/24/2019	137.79	Small Animal yes
44	Gatsby	11/1/2018	140.63	Reptile cold-blooded
45	Koda	2/18/2021	111.36	Small Animal yes
46	Marley	1/28/2023	31.76	Cat Selkirk Rex
47	Gigi	2/14/2019	152.37	Rabbit yes
48	Samson	11/11/2020	129.66	Small Animal yes
49	Phoebe	6/8/2022	45.08	Bird walks
50	Baxter	10/3/2018	83.01	Rabbit no
51	Cleo	6/23/2021	127.47	Small Animal yes
52	Bruno	11/17/2019	83.63	Dog Collie
53	Luna	4/4/2022	159.10	Cat Highlander
54	Zeus	2/7/2023	53.14	Small Animal yes
55	Jasper	2/23/2020	86.02	Reptile cold-blooded
56	Poppy	1/11/2021	17.36	Small Animal yes
57	Cleo	9/24/2018	189.97	Rabbit yes
58	Zeus	1/25/2022	56.38	Cat Sokoke
59	Sadie	7/9/2020	18.83	Bird flies
60	Mimi	3/24/2021	147.15	Small Animal no
61	Max	9/16/2019	136.24	Reptile warm
62	Taz	3/6/2023	74.33	Rabbit yes
63	Poppy	11/19/2022	87.60	Dog Chow Chow
64	Sasha	12/9/2018	56.94	Small Animal yes
65	Lulu	5/25/2020	37.72	Cat Javanese
66	Thor	11/3/2021	98.18	Bird flies
67	Peanut	5/10/2019	60.44	Small Animal no
68	Oscar	8/13/2022	106.46	Rabbit no
69	Piper	9/1/2020	179.24	Reptile cold-blooded
70	Luna	2/14/2020	152.53	Cat Kurilian Bobtail
71	Simba	1/8/2022	55.69	Small Animal yes
72	Max	7/17/2021	82.38	Reptile warm
73	Ginger	11/21/2018	198.25	Bird walks
74	Shadow	3/12/2022	61.67	Rabbit yes
75	Charlie	9/2/2019	144.10	Small Animal no
76	Bella	6/5/2019	97.36	Dog Basenji
77	Lucky	2/1/2022	144.87	Small Animal no
78	Oliver	12/7/2020	57.67	Rabbit no
79	Daisy	1/15/2023	82.79	Reptile cold-blooded
80	Rocky	12/27/2018	88.67	Small Animal yes
81	Molly	4/19/2021	143.48	Bird walks
82	Tucker	2/14/2023	75.03	Small Animal no
83	Lucy	7/28/2020	133.89	Cat American Curl
84	Leo	11/6/2022	19.90	Rabbit yes
85	Sadie	5/22/2019	135.08	Reptile cold-blooded
86	Coco	12/4/2018	114.53	Small Animal yes
87	Buddy	5/11/2020	115.72	Dog Afghan Hound
88	Pepper	3/9/2021	125.88	Small Animal no
89	Zeus	8/29/2022	123.09	Rabbit yes
90	Bailey	6/10/2020	38.62	Cat Tiffany
91	Ruby	12/2/2021	181.41	Small Animal yes
92	Thor	12/20/2022	110.49	Reptile cold-blooded
93	Rosie	3/28/2023	71.60	Small Animal yes
94	Bandit	10/14/2018	94.17	Bird flies
95	Chloe	1/31/2019	177.52	Rabbit no
96	Duke	1/23/2020	132.52	Small Animal yes
97	Maggie	5/7/2021	39.33	Dog Scottish Terrier
98	Milo	3/20/2023	81.05	Cat Khao Manee
99	Blue	9/12/2018	30.69	Small Animal yes
100	Lola	8/8/2020	86.05	Reptile warm
101	Harley	9/16/2021	120.53	Rabbit yes
102	Abby	7/21/2019	34.60	Small Animal yes
103	Finn	7/1/2022	59.41	Bird walks
104	Roxy	9/19/2020	48.81	Small Animal yes
105	Winston	4/2/2023	64.76	Rabbit no
106	Mia	5/10/2022	57.81	Reptile warm
107	Bear	12/14/2018	36.23	Small Animal yes
108	Stella	4/1/2019	46.94	Cat Oriental Shorthair
109	Jack	10/30/2021	181.16	Small Animal yes
110	Nala	1/2/2023	52.72	Dog Lhasa Apso
111	Rusty	4/27/2020	163.06	Small Animal yes
112	Gatsby	9/11/2022	43.02	Rabbit yes
113	Koda	6/24/2019	145.88	Reptile cold-blooded
114	Marley	11/1/2018	85.52	Small Animal yes
115	Gigi	2/18/2021	9.47	Cat Siberian
116	Samson	1/28/2023	107.71	Small Animal yes
117	Phoebe	2/14/2019	84.87	Bird flies
118	Baxter	11/11/2020	30.01	Rabbit no
119	Cleo	6/8/2022	121.19	Small Animal yes
120	Bruno	10/3/2018	59.33	Reptile warm
121	Luna	6/23/2021	42.22	Small Animal yes
122	Zeus	11/17/2019	129.60	Cat Toyger
123	Jasper	4/4/2022	80.43	Rabbit yes
124	Poppy	2/7/2023	77.96	Small Animal yes
125	Cleo	2/23/2020	108.48	Dog Bloodhound
126	Zeus	1/11/2021	70.92	Small Animal yes
127	Sadie	9/24/2018	96.55	Reptile warm
128	Mimi	1/25/2022	180.27	Small Animal yes
129	Max	7/9/2020	150.20	Rabbit no
130	Taz	3/24/2021	94.70	Bird walks
131	Poppy	9/16/2019	101.44	Small Animal yes
132	Sasha	3/6/2023	137.74	Cat Aegean
133	Lulu	11/19/2022	117.52	Reptile cold-blooded

OUTPUT PROBLEMS PORTS TERMINAL DEBUG CONSOLE

134	Thor	12/9/2018	22.81	Small Animal	yes
135	Peanut	5/25/2020	19.76	Rabbit	yes
136	Oscar	11/3/2021	29.17	Small Animal	yes
137	Piper	5/10/2019	53.06	Dog	English Mastiff
138	Shadow	8/13/2022	39.19	Small Animal	yes
139	Bella	9/1/2020	133.89	Bird	walks

Average price of Rabbit: \$85.88

Names of pets with special feature 'flies': Luna, Bailey, Sadie, Thor, Bandit, Phoebe

Species Statistics:

Species: Bird  
Average Price: \$92.23  
Average Age: 2.93 years

Species: Reptile  
Average Price: \$92.57  
Average Age: 3.50 years

Species: Small Animal  
Average Price: \$94.23  
Average Age: 2.96 years

Species: Dog  
Average Price: \$82.20  
Average Age: 3.25 years

Species: Cat  
Average Price: \$90.60  
Average Age: 2.68 years

Species: Rabbit  
Average Price: \$85.88  
Average Age: 2.62 years

Species: Small Animal  
Average Price: \$53.14  
Average Age: 1.00 years

○ safia@Safias-Air Pet Project % █

## HERE'S THE CROPPED VERSION SPECIFICALLY FOR TASK 3:

OUTPUT PROBLEMS PORTS TERMINAL DEBUG CONSOLE

### Species Statistics:

Species: Bird  
Average Price: \$92.23  
Average Age: 2.93 years

Species: Reptile  
Average Price: \$92.57  
Average Age: 3.50 years

Species: Small Animal  
Average Price: \$94.23  
Average Age: 2.96 years

Species: Dog  
Average Price: \$82.20  
Average Age: 3.25 years

Species: Cat  
Average Price: \$90.60  
Average Age: 2.68 years

Species: Rabbit  
Average Price: \$85.88  
Average Age: 2.62 years

Species: Small Animal  
Average Price: \$53.14  
Average Age: 1.00 years  
○ safia@Safias-Air Pet Project % ]

# TASK 4

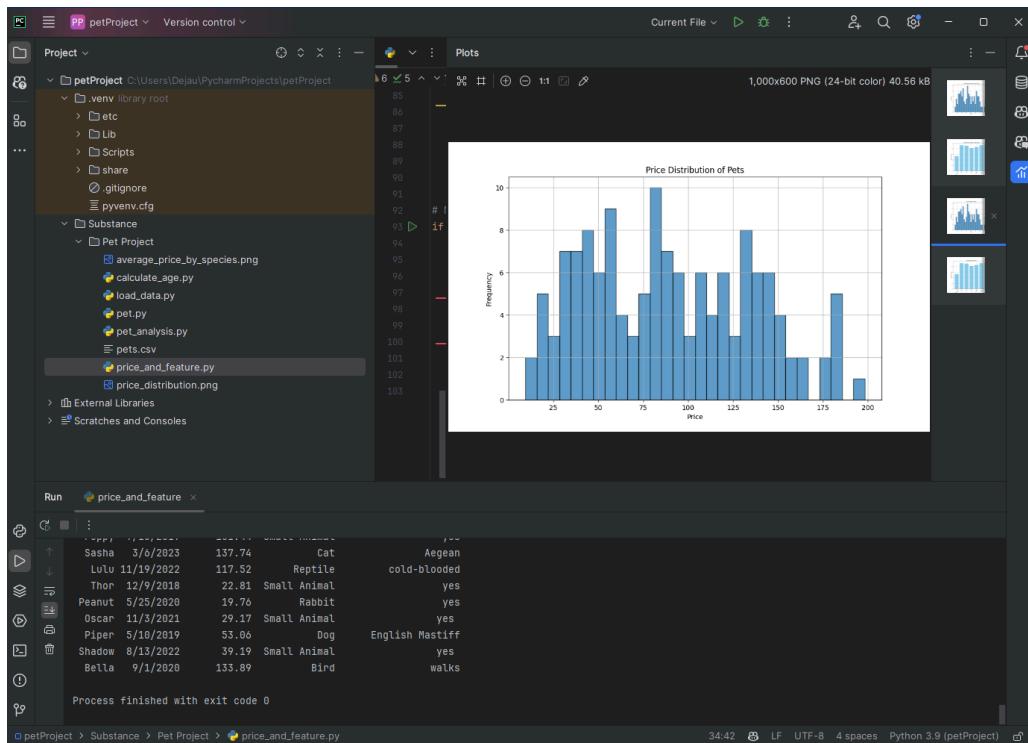
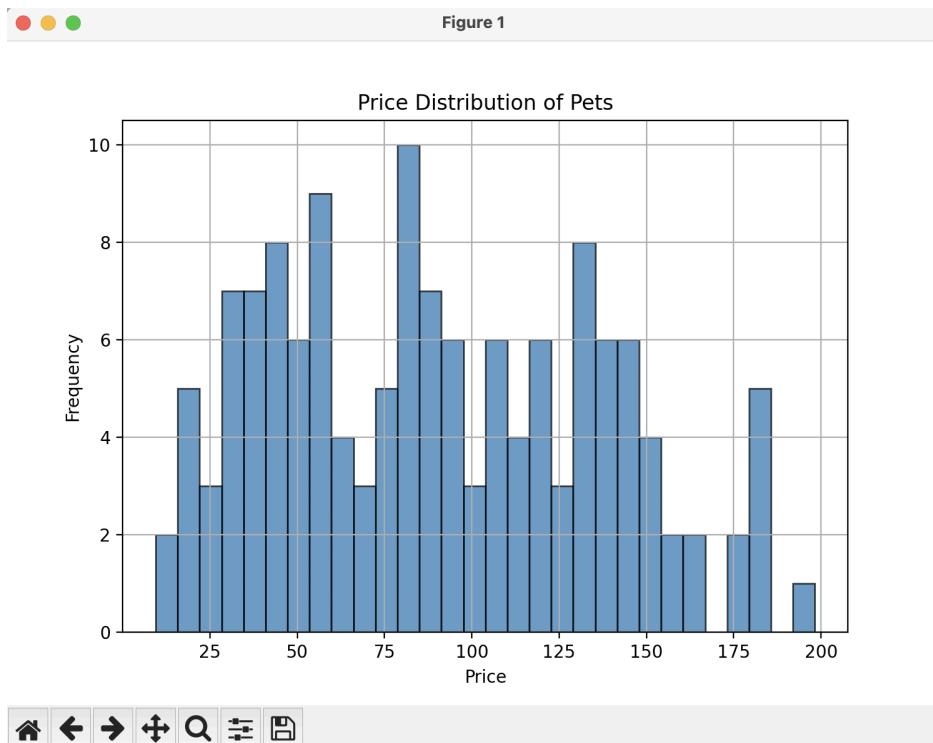


Figure 1



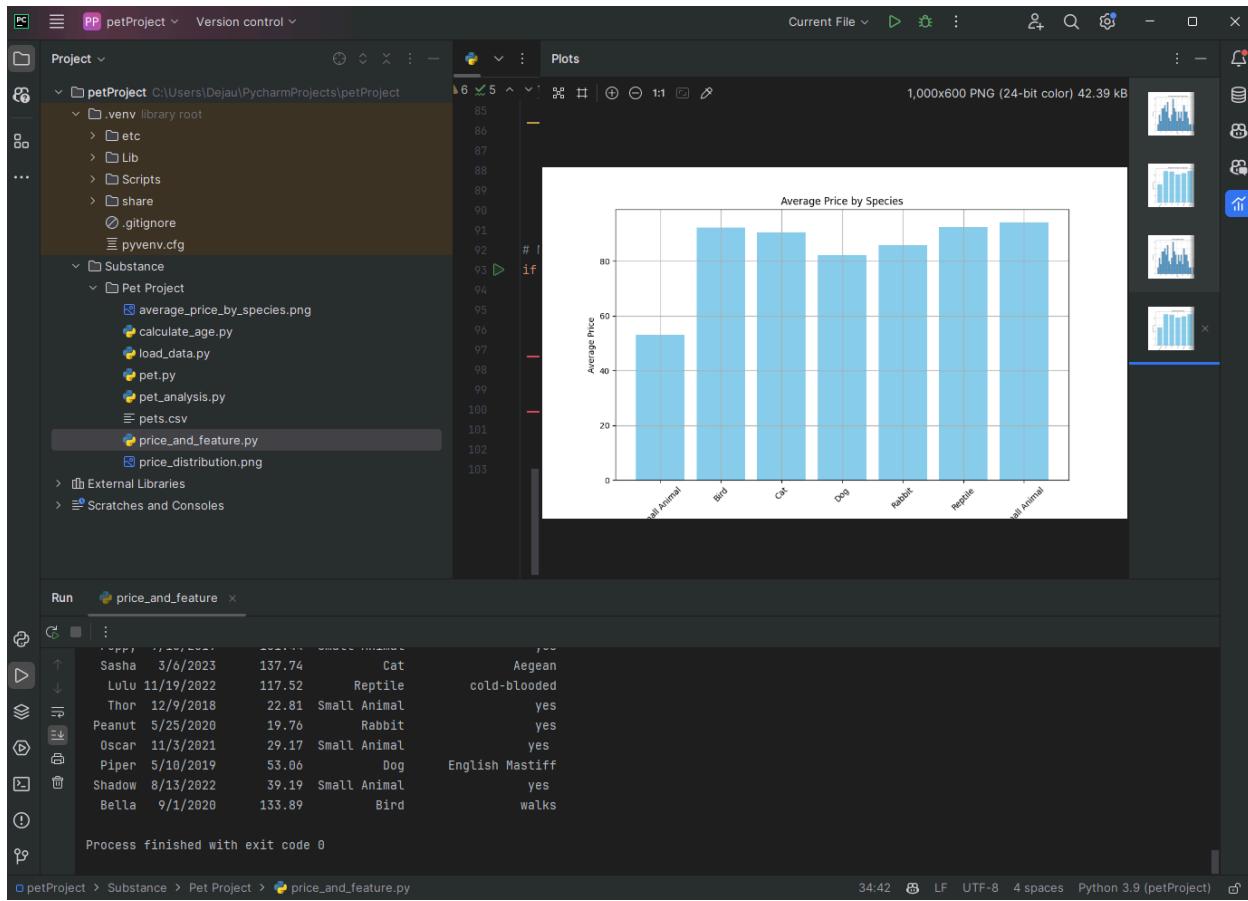
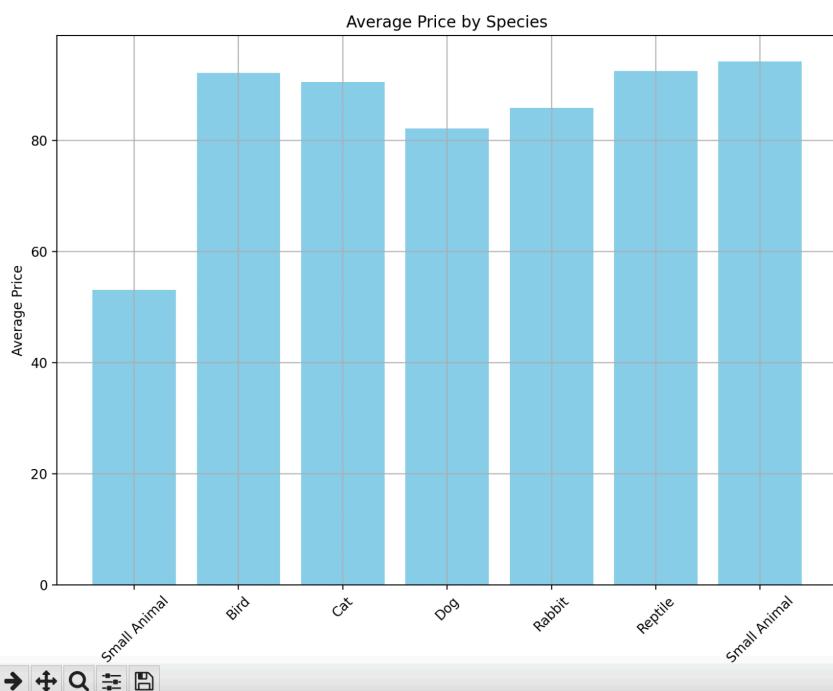


Figure 1



```

❶ price_and_feature.py ×
❷ price_and_feature.py > ...
1  # Pet Project
2  # price_and_feature.py
3  # CPS 3320x16
4  # Safia Abukasim, Dejaun Gayle
5
6  import pandas as pd
7  import matplotlib.pyplot as plt
8  import seaborn as sns
9  import plotly.express as px
10 from pet import clean_data
11 from load_data import load_data
12 from calculate_age import calculate_age
13
14
15 def calculate_average_price(df, species):
16     # Filter by species
17     filtered_df = df[df['Species'] == species]
18     # Check if empty
19     if filtered_df.empty:
20         # If there's no data then return None
21         return None
22     return filtered_df['Price'].mean()
23
24
25 def find_pets_with_feature(df, feature):
26     # Filter by special feature
27     filtered_df = df[df['SpecialFeature'] == feature]
28     # Return names
29     return filtered_df['Name'].tolist()
30
31
32 def plot_price_distribution(df):
33     plt.figure(figsize=(10, 6))
34     plt.hist(df['Price'], bins=30, edgecolor='k', alpha=0.7)
35     plt.title('Price Distribution of Pets')
36     plt.xlabel('Price')
37     plt.ylabel('Frequency')
38     plt.grid(True)
39     plt.savefig('price_distribution.png')
40     plt.show()
41
42
43 def plot_average_price_by_species(df):
44     avg_prices = df.groupby('Species')['Price'].mean().reset_index()
45
46     plt.figure(figsize=(10, 6))
47     plt.bar(avg_prices['Species'], avg_prices['Price'], color='skyblue')
48     plt.title('Average Price by Species')
49     plt.xlabel('Species')
50     plt.ylabel('Average Price')
51     plt.xticks(rotation=45)
52     plt.grid(True)
53     plt.savefig('average_price_by_species.png')
54     plt.show()
55
56
57 def plot_price_vs_age():
58     # Calculate age
59     df['Age'] = df['Birthdate'].apply(calculate_age)
60
61     plt.figure(figsize=(10, 6))
62     sns.scatterplot(x='Age', y='Price', data=df)
63     plt.title('Price vs Age of Pets')
64     plt.xlabel('Age (years)')
65     plt.ylabel('Price')
66     plt.grid(True)
67     plt.savefig('price_vs_age.png')
68     plt.show()
69
70
71 def plot_age_distribution_by_species(df):
72     df['Age'] = df['Birthdate'].apply(calculate_age)
73
74     fig = px.box(df, x='Species', y='Age', title='Age Distribution by Species', points="all")
75     fig.update_layout(
76         title={
77             'text': 'Age Distribution by Species',

```

```
78     'y': 0.9,
79     'x': 0.5,
80     'xanchor': 'center',
81     'yanchor': 'top'
82   },
83   title_font_size=24,
84   title_font_color='cyan',
85   plot_bgcolor='black',
86   paper_bgcolor='black',
87   font_color='white'
88 )
89 fig.write_image('age_distribution_by_species.png')
90 fig.show()
91
92
93 # Main execution for Task 4 and Task 5
94 if __name__ == "__main__":
95     # Load and clean data
96     file_path = 'pets.csv'
97     df = clean_data(load_data(file_path))
98
99     if df is not None:
100         # Task 4a: Plot Price Distribution
101         plot_price_distribution(df)
102
103         # Task 4b: Plot Average Price by Species
104         plot_average_price_by_species(df)
105
106         # Main execution for Task 5
107         # Task 5a: Plot Price vs Age (Seaborn)
108         plot_price_vs_age(df)
109
110         # Task 5b: Plot Age Distribution by Species (Plotly)
111         plot_age_distribution_by_species(df)
112     else:
113         print("Data loading and cleaning failed.")
```

# TASK 5

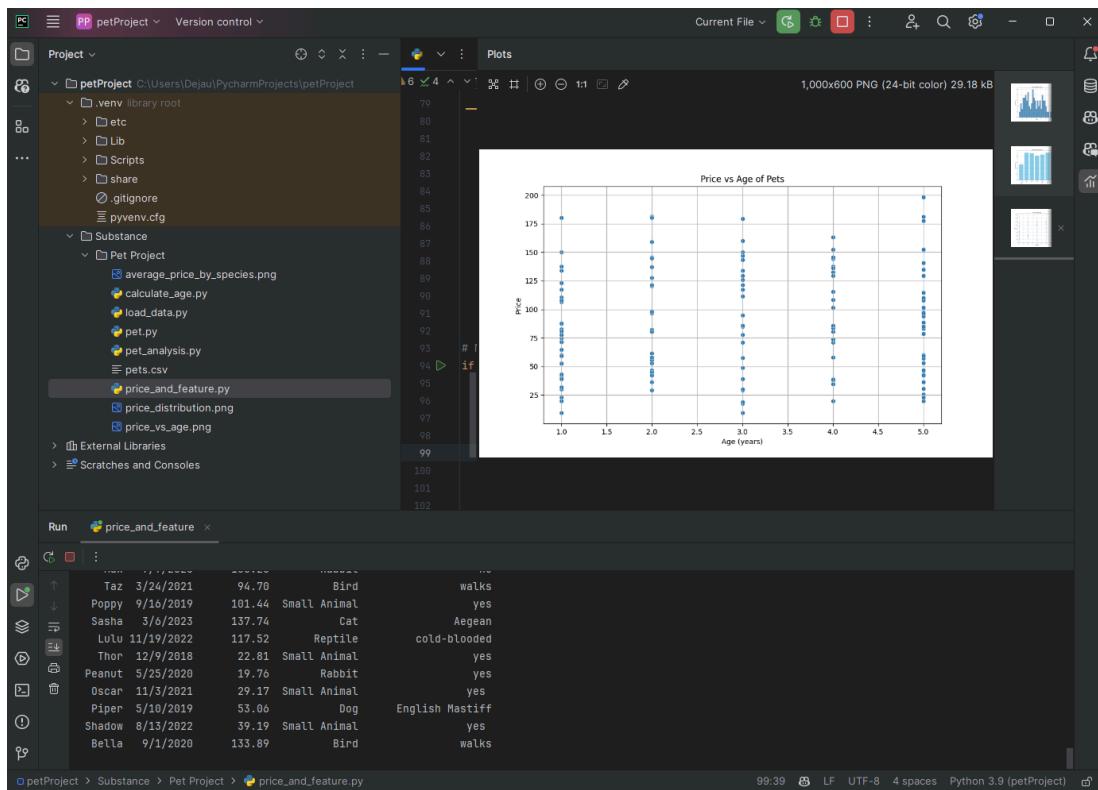
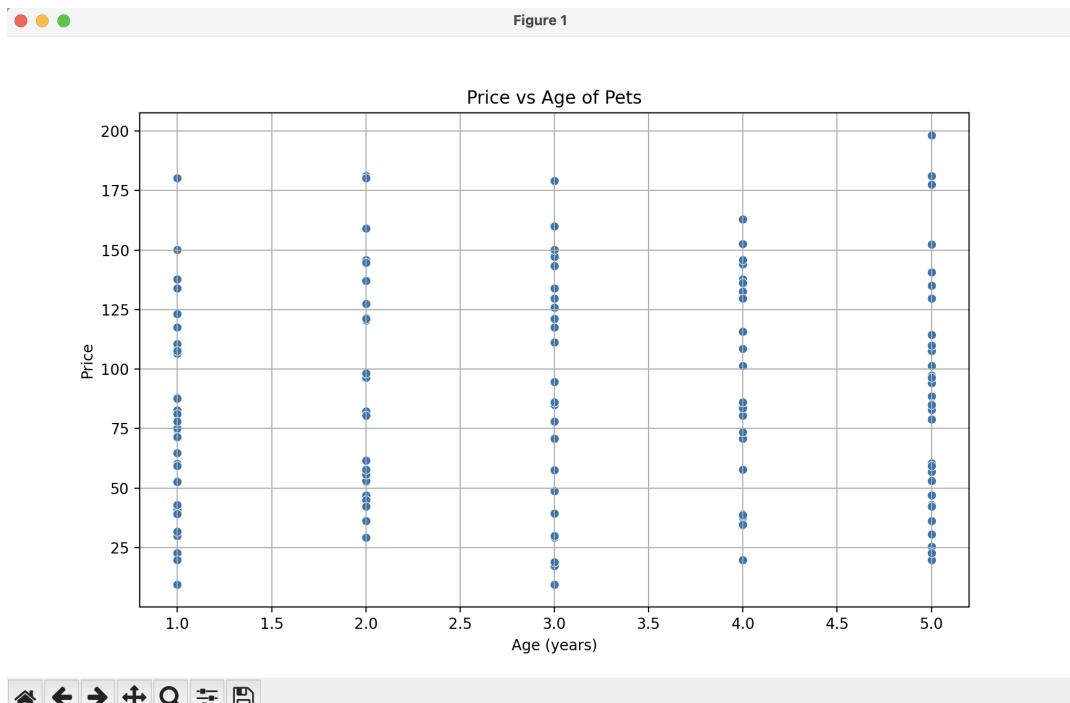
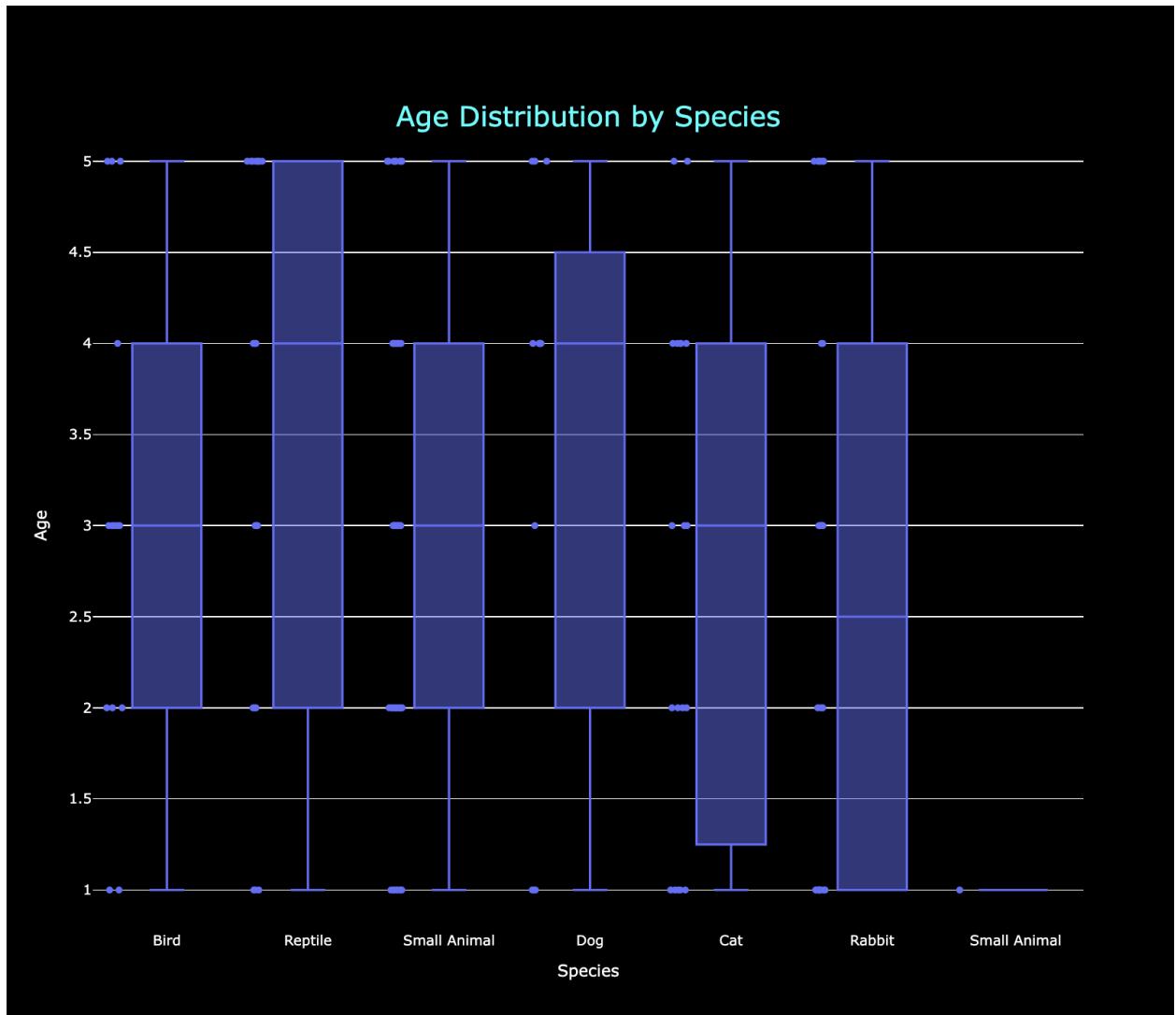


Figure 1





**(IN ORDER FOR THIS ONE TO SHOW UP, YOU MUST  
DO pip install -U kaleido)**

```

⌚ price_and_feature.py ✘
⌚ price_and_feature.py > ...
1  # Pet Project
2  # price_and_feature.py
3  # CPS 3320x16
4  # Safia Abukasim, Dejaun Gayle
5
6  import pandas as pd
7  import matplotlib.pyplot as plt
8  import seaborn as sns
9  import plotly.express as px
10 from pet import clean_data
11 from load_data import load_data
12 from calculate_age import calculate_age
13
14
15 def calculate_average_price(df, species):
16     # Filter by species
17     filtered_df = df[df['Species'] == species]
18     # Check if empty
19     if filtered_df.empty:
20         # If there's no data then return None
21         return None
22     return filtered_df['Price'].mean()
23
24
25 def find_pets_with_feature(df, feature):
26     # Filter by special feature
27     filtered_df = df[df['SpecialFeature'] == feature]
28     # Return names
29     return filtered_df['Name'].tolist()
30
31
32 def plot_price_distribution(df):
33     plt.figure(figsize=(10, 6))
34     plt.hist(df['Price'], bins=30, edgecolor='k', alpha=0.7)
35     plt.title('Price Distribution of Pets')
36     plt.xlabel('Price')
37     plt.ylabel('Frequency')
38     plt.grid(True)
39     plt.savefig('price_distribution.png')
40     plt.show()
41
42
43 def plot_average_price_by_species(df):
44     avg_prices = df.groupby('Species')['Price'].mean().reset_index()
45
46     plt.figure(figsize=(10, 6))
47     plt.bar(avg_prices['Species'], avg_prices['Price'], color='skyblue')
48     plt.title('Average Price by Species')
49     plt.xlabel('Species')
50     plt.ylabel('Average Price')
51     plt.xticks(rotation=45)
52     plt.grid(True)
53     plt.savefig('average_price_by_species.png')
54     plt.show()
55
56
57 def plot_price_vs_age(df):
58     # Calculate age
59     df['Age'] = df['Birthdate'].apply(calculate_age)
60
61     plt.figure(figsize=(10, 6))
62     sns.scatterplot(x='Age', y='Price', data=df)
63     plt.title('Price vs Age of Pets')
64     plt.xlabel('Age (years)')
65     plt.ylabel('Price')
66     plt.grid(True)
67     plt.savefig('price_vs_age.png')
68     plt.show()
69
70
71 def plot_age_distribution_by_species(df):
72     df['Age'] = df['Birthdate'].apply(calculate_age)
73
74     fig = px.box(df, x='Species', y='Age', title='Age Distribution by Species', points="all")
75     fig.update_layout(
76         title={
77             'text': 'Age Distribution by Species',

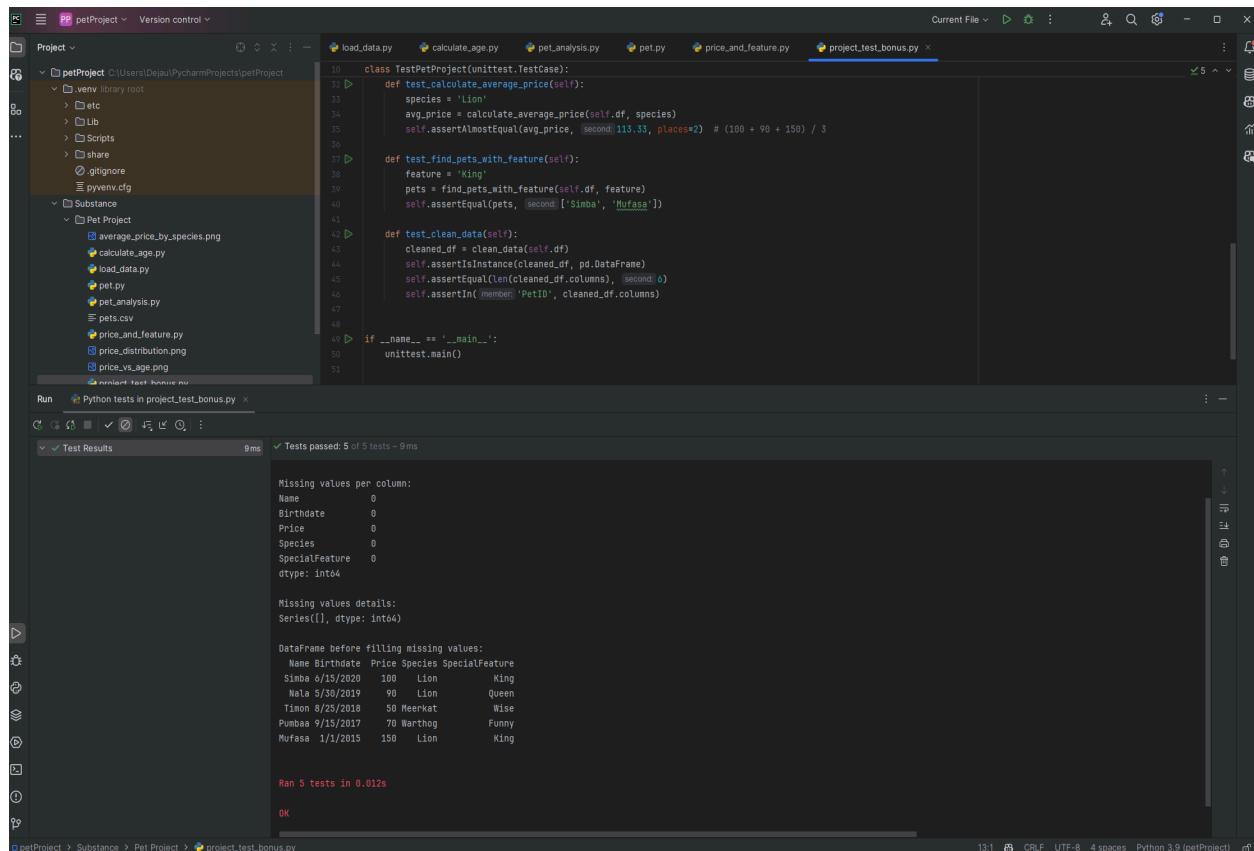
```

```
78     'y': 0.9,
79     'x': 0.5,
80     'xanchor': 'center',
81     'yanchor': 'top'
82   },
83   title_font_size=24,
84   title_font_color='cyan',
85   plot_bgcolor='black',
86   paper_bgcolor='black',
87   font_color='white'
88 )
89 fig.write_image('age_distribution_by_species.png')
90 fig.show()
91
92
93 # Main execution for Task 4 and Task 5
94 if __name__ == "__main__":
95     # Load and clean data
96     file_path = 'pets.csv'
97     df = clean_data(load_data(file_path))
98
99     if df is not None:
100         # Task 4a: Plot Price Distribution
101         plot_price_distribution(df)
102
103         # Task 4b: Plot Average Price by Species
104         plot_average_price_by_species(df)
105
106         # Main execution for Task 5
107         # Task 5a: Plot Price vs Age (Seaborn)
108         plot_price_vs_age(df)
109
110         # Task 5b: Plot Age Distribution by Species (Plotly)
111         plot_age_distribution_by_species(df)
112     else:
113         print("Data loading and cleaning failed.")
```

# BONUS

```
project_test_bonus.py X
project_test_bonus.py > ...
1  # Pet Project
2  # project_test_bonus.py
3  # CPS 3320*16
4  # Safia Abukasim, Dejaun Gayle
5
6  import unittest
7  from datetime import datetime
8  import pandas as pd
9  from load_data import load_data
10 from calculate_age import calculate_age
11 from pet_analysis import calculate_average_price, find_pets_with_feature
12 from price_and_feature import clean_data
13
14
15 class TestPetProject(unittest.TestCase):
16
17     # Setting up sample dataframe for testing
18     def setUp(self):
19         self.data = {
20             'Name': ['Simba', 'Nala', 'Timon', 'Pumbaa', 'Mufasa'],
21             'Birthdate': ['6/15/2020', '5/30/2019', '8/25/2018', '9/15/2017', '1/1/2015'],
22             'Price': [100, 90, 50, 70, 150],
23             'Species': ['Lion', 'Lion', 'Meerkat', 'Warthog', 'Lion'],
24             'SpecialFeature': ['King', 'Queen', 'Wise', 'Funny', 'King']
25         }
26         self.df = pd.DataFrame(self.data)
27
28     # Test loading dataframe of pets.csv
29     def test_load_data(self):
30         df = load_data('pets.csv')
31         self.assertIsInstance(df, pd.DataFrame)
32
33     # Test calculating age
34     def test_calculate_age(self):
35         birthdate_str = '6/15/2020'
36         age = calculate_age(birthdate_str)
37         expected_age = datetime.today().year - datetime.strptime(birthdate_str, "%m/%d/%Y").year
38         self.assertEqual(age, expected_age)
39
40     # Test calculating average price
41     def test_calculate_average_price(self):
42         species = 'Lion'
43         avg_price = calculate_average_price(self.df, species)
44         self.assertAlmostEqual(avg_price, 113.33, places=2) # (100 + 90 + 150) / 3
45
46     # Test finding pets with a specific feature
47     def test_find_pets_with_feature(self):
48         feature = 'King'
49         pets = find_pets_with_feature(self.df, feature)
50         self.assertEqual(pets, ['Simba', 'Mufasa'])
51
52     # Test cleaning data
53     def test_clean_data(self):
54         cleaned_df = clean_data(self.df)
55         self.assertIsInstance(cleaned_df, pd.DataFrame)
56         self.assertEqual(len(cleaned_df.columns), 6)
57         self.assertIn('PetID', cleaned_df.columns)
58
59
60 if __name__ == '__main__':
61     unittest.main()
```

## Look at terminal for the test:



The screenshot shows the PyCharm IDE interface with the following details:

- Project View:** Shows the project structure under "petProject".
- Code Editor:** Displays the file `project_test_bonus.py` containing a unit test class `TestPetProject` with three test methods: `test_calculate_average_price`, `test_find_pets_with_feature`, and `test_clean_data`.
- Run Tab:** Shows the command `Python tests in project_test_bonus.py` and the output:
  - Tests passed: 5 of 5 tests - 9 ms
  - Missing values per column:

Name	Count
Name	0
Birthdate	0
Price	0
Species	0
SpecialFeature	0
  - Missing values details:

Series	Count
Series[[]]	0
  - DataFrame before filling missing values:

Name	Birthdate	Price	Species	SpecialFeature
Simba	6/15/2020	100	Lion	King
Nala	5/30/2019	90	Lion	Queen
Timon	8/23/2018	50	Meerkat	Wise
Pumbaa	9/15/2017	70	Warthog	Funny
Mufasa	1/1/2015	150	Lion	King
  - Ran 5 tests in 0.012s
  - OK

## Analysis

### - Price Distribution of Pets

The price distribution histogram reveals that most pets are priced between \$50 and \$150, with Mufasa being the most expensive. This indicates the general affordability of pets within the dataset (relative), with characters like Simba and Mufasa having higher prices due to their significant roles (*as far as the Lion King movie is concerned which is where I got the test characters from*).

### - Average Price by Species

This is a bar chart of average prices by species that shows significant variation with Lions being the most expensive on average, which is expected given their royal status. Warthogs and Meerkats are generally more affordable, reflecting their roles as side characters. This pricing

trend aligns with the understanding that main characters tend to be a lot more expensive due to their popularity and importance in the storyline.

- **Age Distribution by Species**

The box plot of age distribution reveals the following insights: Lions have a wide age range, indicating the presence of both young and older characters. Meerkats and Warthogs exhibit a diverse age range, indicating availability across different life stages.

- **Special Features of Pets**

Analyzing special features, we find that unique traits like "King" for Simba and Mufasa add value and are likely correlated with higher prices. This emphasizes the importance of unique characteristics in determining pet value.

- **Conclusion**

The analysis of employee data provides valuable insights into pricing strategies and inventory management. With that being said understanding price distribution, species-specific pricing, and age demographics can help us in making informed decisions regarding marketing, pricing, and stocking.

**Github Repository Link: <https://github.com/DejaunG/petProject>**

**Both the pdf of this and the Zip file containing the codes are attached in Canvas!**