

ENVIRONMENTAL JUSTICE

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OVERVIEW

- Topic
 - Why did we choose endangered species?
- Data set
- Description of Program
 - Insert data
 - Display data
 - Delete data
 - Search data
 - Sort data
- Individual functions

TOPIC

- Topic: Environmental Justice
- Focus: Endangered Species
- Why did we choose this topic?
 - When we thought of environmental justice, the two aspects we brainstormed were environment and wildlife. Because many of the topics we thought of for the environment were similar to climate change, we decided to focus on wildlife. Therefore, researchers and creating a program targeting endangered species felt like the perfect fit.

DATA SET

- Our data set is comprised of information gathered from the American National Park system
- The data collected focuses on the biodiversity of said National Parks.
- The information is organized by species ID, park name, taxonomic information, scientific name, one or more common names, record status, occurrence (verification of species presence in park), nativeness (species native or foreign to park), abundance (presence and visibility of species in park), seasonality (season and nature of presence in park), and conservation status (species classification according to US Fish & Wildlife Service).
- <https://www.kaggle.com/nationalparkservice/park-biodiversity/version/3?select=species.csv>

DESCRIPTION OF PROGRAM

- **Insert Data**
 - The program will include a function which will be able to pull information from the `species.csv`.
- **Display Data**
 - The program will include a function to display the entire data set.
- **Delete Data**
 - The program will include a function that will allow the user to delete a specific animal from the list.
- **Search Data**
 - The program will include a function that will allow the user to search for information regarding a specific animal.
- **Sort Data**
 - The program will include a function that will allow the user to sort the data by occurrence.

INDIVIDUAL FUNCTIONS

- Ideas:
 - Search for a list of animals by category (Greg)
 - Find the length of the list
 - Search for a list of animals by order (Devin)
 - Find the length of the list
 - Search for a list of animals by family (Greg)
 - Find the length of the list
 - Search for a list of animals by National Park
 - Find the length of the list
 - Check if an animal is native or not (Devin)
 - Enter scientific name and return common name (Tychicus)
 - Enter common name and return scientific name
 - Check if the animal is abundant or not (Tychicus)

PROJECT PRESENTATION: INTRODUCTION



- Purpose:

- This project was completed with the idea of looking at the topic of Environmental Justice from a different angle instead of focusing on areas like climate change and pollution. The application focuses on endangered species as a topic. The application allows the user to perform simple tasks such as displaying, searching, sorting, and deleting information. This project is to be used as starting point for future additions to the application to make it more advanced.



DESIGN

- The Design:
 - The application is designed in a user-friendly manner using a menu and text prompts.
- Data Structure Used and Why
 - A dynamic array is used as a skeleton for the entire application. Each column of information is inserted into a variable, and all the variables are inserted into a struct. Every struct represents an element in the array.
 - The dynamic array was chosen because of its versatility. We knew that the best way to organize the data was to insert the data into a struct. The question that we needed to answer was how do we use and manipulate the data? The dynamic array allows us to accomplish every one of our functions.
- <https://github.com/DJohnson2021/CSC-228-Data-Structures-and-Algorithms>

PERFORMANCE AND ALGORITHMS

- The algorithms within the application focus on allowing the user to search and find specific information about one or many animals.
- All of the algorithms used in the applications work as intended, but a couple of them have room for improvement in time constriction and the input they use. The application displays the time duration of each algorithm in ticks for the user. We had to compromise with some algorithms because it was not possible to manipulate the data set in the way we wanted. Further testing and improvement are required.

HOW TO?

- After running the application, a menu, as well as a text prompt, should be displayed.

```
> make -s
> ./main
*****
Menu
*****
1. Display Animal List
*****
2. Delete a Random Animal
*****
3. Sort by Occurence
*****
4. Search Conservation Status
*****
5. Nativeness Check
*****
6. Search by Order
*****
7. Scientific to Common Swap
*****
0. Exit Application
*****
Choose a task to complete, choose 0 to exit application: |
```

HOW TO?

- The is an operation corresponding to a number from zero to seven. The program should ask you to enter a number to complete a task. If a number outside the range given is chosen, the program will ask you again to select a task until a recognizable number is entered.
- After choosing a task for the program to complete, the program will execute the task.

```
make -s
./main
*****
|                               |
|                               | Menu |
|                               |-----|
|                               | 1. Display Animal List |
|                               |-----|
|                               | 2. Delete a Random Animal |
|                               |-----|
|                               | 3. Sort by Occurrence |
|                               |-----|
|                               | 4. Search Conservation Status |
|                               |-----|
|                               | 5. Nativeness Check |
|                               |-----|
|                               | 6. Search by Order |
|                               |-----|
|                               | 7. Scientific to Common Swap |
|                               |-----|
|                               | 8. Exit Application |
|                               |-----|
|                               |
|                               | Choose a task to complete, choose 0 to exit application: 3
|                               |
|                               | Sort took: 1114 ticks
|                               | Would you like to see the new list? (Y/N) |
|                               |
```

HOW TO?

Choose a task to complete, choose 0 to exit application: 3

Sort took: 1114 ticks

Would you like to see the new list? (Y/N) y

Spec ID	Occurrence	Park Name	Native	Category	Order	Family	Scientific Name	Common Name	Rec
1. ACAD-1003	Approved	Acadia National Park	Native	Mammal	Carnivora	Canidae	Canis lupus	Eastern Timber Wolf; Gray Wolf; Timber Wolf	
2. ACAD-1005	Not Confirmed	Acadia National Park	Native	Mammal	Carnivora	Endangered, Felidae	Lynx canadensis	Canada Lynx	Approved
3. ACAD-1006	Native	Acadia National Park	Native	Mammal	Carnivora	Felidae	Lynx rufus	Bay Lynx; Bobcat; Red Lynx; Wild Cat	Approved
4. ACAD-1007	Not Present (Historical Report)	Acadia National Park	Not Native	Mammal	Carnivora	Vagant	Mephitis mephitis	Eastern Skunk; Polecat; Striped Skunk	Not Confirmed
5. ACAD-1010	Approved	Acadia National Park	Native	Mammal	Carnivora	Mephitidae	Mephitis mephitis	Eastern Skunk; Polecat; Striped Skunk	Approved
6. ACAD-1013	Not Present (Historical Report)	Acadia National Park	Not Native	Mammal	Carnivora	Mustelidae	Mustela	Weasel	In Review
7. ACAD-1015	Not Confirmed	Acadia National Park	Native	Mammal	Carnivora	Mustelidae	Mustela macroura	Ancient Sea Mink; Big Sea Mink; Sea Mink	Not Confirmed
8. ACAD-1016	Not Native	Acadia National Park	Native	Mammal	Carnivora	Odobenidae	Odobenus rosmarus	Walrus	Approved
9. ACAD-1017	Confirmed	Acadia National Park	Native	Mammal	Carnivora	Phocidae	Halichoerus grypus	Gray Seal	Approved
10. ACAD-1025	Not Confirmed	Acadia National Park	Native	Mammal	Carnivora	Phocidae	Phoca vitulina	Common Seal; Hair Seal; Harbor Seal	Not Confirmed
11. ACAD-1027	Approved	Acadia National Park	Native	Mammal	Chiroptera	Vespertilionidae	Myotis leibii	Eastern Small-Footed Myotis; Small-Footed Myotis	Approved
12. ACAD-1028	Not Present (False Report)	Acadia National Park	Not Native	Mammal	Chiroptera	Vespertilionidae	Pipistrellus hesperus	Eastern Pipistrelle; Northern Great Horned Owl	Not Confirmed
13. ACAD-1032	Approved	Acadia National Park	Native	Mammal	Rodentia	Cricetidae	Microtus pennsylvanicus	Field Mouse; Meadow Mouse; Meadow Mouse	Approved
14. ACAD-1039	Not Present (Historical Report)	Acadia National Park	Not Native	Mammal	Rodentia	Cricetidae	Ondatra zibethicus	Common Muskrat; Muskrat; Muskrat; Muskrat	Not Present
15. ACAD-1040	Not Confirmed	Acadia National Park	Native	Mammal	Rodentia	Muridae	Mus musculus	House Mouse	Approved
16. ACAD-1043	Not Native	Acadia National Park	Native	Mammal	Rodentia	Muridae	Rattus norvegicus	Brown Rat; Norway Rat	Approved
17. ACAD-1044	Not Confirmed	Acadia National Park	Native	Mammal	Rodentia	Sciuridae	Glaucocys	Glaucocys Sp.	In Review
18. ACAD-1054	Not Confirmed	Acadia National Park	Native	Mammal	Rodentia	Sciuridae	Glaucocys volans	Southern Flying Squirrel	Approved
19. ACAD-1054	Not Confirmed	Acadia National Park	Native	Mammal	Soricomorpha	Talpidae	Parascalops breweri	Brewer's Mole; Hairy-Tailed Mole	Approved

- After the task is completed, the program will display the time it took to complete the task in ticks.
- Some tasks manipulate the information within the data set. After the completion of these tasks, the program will ask you if you would like to view the new list. You as the user are required to enter either “y” or “n” in response to the prompt. The program will automatically capitalize the characters you enter for its use.

HOW TO?

- After printing the new list, the program will ask you if you would like the program to execute another task. You will need to enter “y” or “n” as a response. If “n” is entered the program will end. If “y” is entered, the program will prompt you to enter a number just like in the beginning.

```
Task completed. Would you like to choose another task?(Y/N) n  
Application Closed
```

