

Virtual Zoo Guide

Team Members:

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1.0 Scope

1.1 Identification

This written document was written for the program called ‘Virtual Zoo Guide[.]’ Any and all information provided here will only be for this specific program and version. Please see other documentation for the appropriate version as applicable.

1.2 System Overview

‘Virtual Zoo Guide’ was made to be a virtual tour guide of Hattiesburg Zoo. The idea was to create a program that could allow someone to view the zoo and all of its animals from home, or use it as a guide while in the zoo and have all the facts they might want to know just a few taps away.

If this project were to actually be available to the public, it should be published on the Hattiesburg Zoo website. One would logically think that it would be placed as an option in a menu available on their homepage. When the option is selected from the menu, it would load what we have as the homepage for ‘Virtual Zoo Guide[.]’

1.3 Document Overview

The purpose of this document is to go over the requirements, design and test plan for ‘Virtual Zoo Guide[.]’ The requirements will be put into a table format with referenced to the design, test plan, and test results for each portion. The design will detail how the requirements will be fulfilled. The test plan will detail how the design is tested. After all of that there will be the appendix which will include the test results for the program.

2.0 Referenced Documents

The project can be found for download at the following web address:

<https://github.com/rgrantland/CSC424/blob/master/CapstoneProject/ProjectCode/ZooGuide.zip>

Here is a video guide on how to run our project:

<https://youtu.be/P9GN6hb8AsA>

The following web addresses were found useful during the development of this project:

- Software download links

1. MySQL Community Server*: <https://dev.mysql.com/downloads/mysql/>
2. MySQL Workbench*: <https://dev.mysql.com/downloads/workbench/>
3. XAMPP localhost server: <https://www.apachefriends.org/download.html>
4. Android Studio: <https://developer.android.com/studio>

* We were unable to get MySQL Community Server and MySQL Workbench to work on a computer with Mac OS. Supposedly there is a way to do this as MySQL has documentation for being able to use their software on Macs, but, again, we were unable to do so.

- XAMPP:

1. Port 3306 in use:
 - a. <https://stackoverflow.com/questions/51467371/mysql-port-already-in-use>
 - b. <https://stackoverflow.com/questions/6136389/cant-start-mysql-port-3306-busy>
2. Installation guide and how to run PHP files from localhost:
<https://www.edureka.co/blog/how-to-run-a-php-program-in-xampp/>

- Loading Virtual Zoo Guide in Android Studio emulator:

1. Troubleshooting visualization in Windows 10 OS:
<https://store.hp.com/us/en/tech-takes/how-to-enter-bios-setup-windows-pcs>
2. Starting the emulator from Android Studio:
<https://developer.android.com/studio/run/emulator>
3. Finding IPv4:
<https://lifehacker.com/how-to-find-your-local-and-external-ip-address-5833108>

- Code examples:

1. HTML:
 - a. Interactive map:
https://www.w3schools.com/html/html_images_imagemap.asp
2. CSS:
 - a. Online color picker:
https://www.google.com/search?client=firefox-b-1-d&sxsrf=ALeKk01CitH6BGpRXvSRygvME6ubQPP4kA%3A1615431318467&lei=loZJYKaGHIbr_QbF6oqwBw&q=color%20picker%20tool&ved=2ahUKEwimqZXPNqfvAhWGdd8KHUW1AnYQsKwBKAB6BAGwEAE&biw=1920&bih=966
 - b. Styling according to screen width:
<https://www.thewizard.com/css/mobile-friendly-responsive-design.shtml>
3. JavaScript/HTML functions:
 - a. Using browser history for back button:
https://www.w3schools.com/jsref/met_his_back.asp
4. PHP:
 - a. Display row options with link to new page for row:
<https://forums.mysql.com/read.php?52,574889>
 - b. How to make unique URL for each row result:
<https://stackoverflow.com/questions/5175588/how-do-i-create-a-unique-php-page-for-each-row-in-a-mysql-database/5175673>

3.0 Requirements

Requirement Identifier	Requirement Statements	Design Section Identifier	Test Section Identifier	Pass/Fail
1.00	Technical Requirements			
1.01	A working browser	1.01	1.01	P
1.02	A database to store animal information	1.02	1.02	P
1.03	A way to populate the database	1.03	1.03	P
1.04	A localhost server to serve the files we create and allow them to interact with the database	1.04	1.04	P
1.05	A way to serve the files through the localhost server (most likely a file path)	1.05	1.05	P
1.06	Some way to load our work onto a mobile screen	1.06	1.06	P
2.00	General Requirements			
2.01	the page shall display a map with general directions upon opening of the application	2.01	2.01 3.01	P P
2.02	when a region of the map is selected, the application shall load a list menu of the animals in that region	2.02	2.02 3.02	P P
2.03	when an animal is selected from the list menu, the application shall load the photos and facts associated with that animal	2.03	2.03 3.03	P P
2.04	there will be 'back' buttons on the animal list menu and the animal facts page that shall lead to the previous screen (the beginning map and animal list menu as applicable)	2.04	2.04 3.04	P P
2.05	When an animal is selected from the list menu, the map will zoom in to show where the animal is. This will be displayed by the animals information.			
2.06	On the home page there should be a search bar to search for a desired animal to see if it is in the zoo. It should show all animals that could match the result. For example, if 'owl' is searched it should pull up every variety of animal with 'owl' in the name such as eastern screech owl, or great horned	2.06	2.06 3.06	P P

	owl.			
2.07	When a region is selected from the map, the new page will display a photo of which region the user selected with the list of animals.	2.07	2.07	P
			3.07	P

4.0 Design

Design Identifier	Design Statements
1.00	Technical Requirements
1.01	FireFox, Chrome, or Microsoft Edge up to date as of the end of 2020 are all acceptable.
1.02	MySQL Community Server version 8.0.23 MySQL Workbench version 8.0.23 - used with MySQL to create and run .sql scripts
1.03	ZooGuide.sql will run in MySQL Workbench to populate the entire database of animals that are currently at Hattiesburg Zoo.
1.04	XAMPP version 7.4.16 or 8.0.3
1.05	XAMPP requires that any files that one wishes to load in browser must be in file path xampp/htdocs
1.06	Android Studio version 4.1.2 - android mobile emulator to load files with localhost server on PC. One could also use their own cell phone as long as it is connected to the same network as the PC.
2.00	General Requirements
2.01	When loaded to http://localhost/ZooGuide/index.php or http://localhost/ZooGuide , the page displays an image map of Hattiesburg Zoo.
2.02	The image map on index.php is covered in svg shapes (clear colored so they are not visible) that when clicked, link to a new page ZooGuide_Region_.php where # is the number assigned to the region. The new page selects animals from the database based on a column called zoo_region where the number in zoo region corresponds to the region number assigned on the map.

2.03	When an animal is selected from the list on the ZooGuide_Region_#.php page, it links to a new page called ZooGuide_AnimalResults.php. This page selects the row of animal facts of the selected animal using the 'common_name'. 'common_name' was made key in the database so that it cannot return null. The ZooGuide_AnimalResults.php page will then use the selected row of information to generate an easy to look at page of information where information will not display if it is equal to null.
2.04	A nav bar is present on all pages. It includes a back button that is tied to the browser history. When the back button is selected, it will return to the last page in browser memory.
2.06	The search bar is present in the nav bar. When used it loads a new page of animal results according to if the combination of characters entered matches any part of the animal's common names. If there are no results, the page will display a message saying there are no results for the user's entry.
2.07	The ZooGuide_Region_#.php pages also include a PNG of the region that was selected from the map.

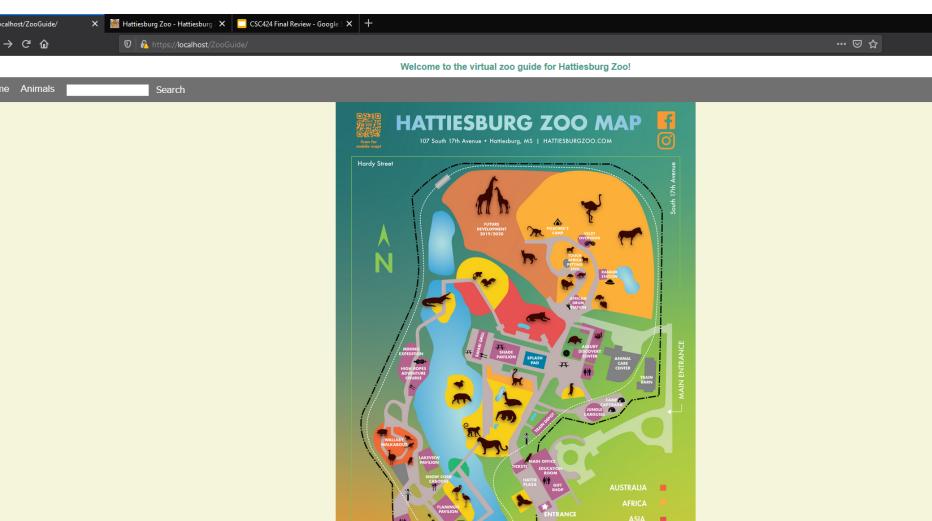
5.0 Test Plan

Test Identifier	Test Statements	Tested by (initials)	Test Result
1.00	Technical Requirements		
1.01	Load browser to a search page. After starting XAMPP with Apache and MySQL servers (test 1.04), load the page http://localhost/ZooGuide .	ZJ	Pass
1.02	Load the MySQL server with no error. Test connection with MySQL Workbench	ZJ	Pass
1.03	Run ZooGuide.sql script in MySQL Workbench without error. Visually check the table after to see if animals are in the table.	HP	Pass
1.04	Load XAMPP with no errors, and start MySQL and Apache servers with no error.	HP	Pass
1.05	Check to make sure the files are in the file path xampp/htdocs.	CC	Pass
1.06	Make sure Android Studio can load without error. Load the emulator by going to tools -> AVD manager then press the	CC	Pass

	triangle symbol that looks like a play button. Alternately, make sure your phone is connected to the same network as your PC and you have a working browser on your phone. For both of the above methods, load the project on the phone screen by using your PC's IPv4 in place of localhost.		
2.00	General Requirements on PC		
2.01	The index.php page will be loaded and visually assessed to be a map of Hattiesburg Zoo.	SW	Pass
2.02	Each region area will be manually clicked on to see if it loads the ZooGuide_Region_#.php page related to the selected region with a list of animals located in that region.	HP	Pass
2.03	Each animal will be manually clicked to see if the ZooGuide_AnimalResults page displays the correct information on the animal.	SW	Pass
2.04	The back button will be tested by navigating from index.php, to a ZooGuide_Region_#.php, then to a ZooGuide_AnimalResults.php page, and use only the back button to get all the way back to index.php. This will be repeated for each region since there are several different ZooGuide_Region_#.php pages.	HP	Pass
2.06	Random animals will be searched in specific and general forms (ex. Canadian Goose and Goose). We will also test to see if random capitalization matters in input. Lastly, there will be tests to see if random bad data pulls results or returns null.	RG	Pass
2.07	Each region will be selected to see if the map displays a photo of just that region on the ZooGuide_Region_#.php page	RG	Pass
3.00	General Requirements on Mobile Device		
3.01	The index.php page will be loaded and visually assessed to be a map of Hattiesburg Zoo.	ZJ	Pass
3.02	At least one region will be selected to see if it pulls up the appropriate ZooGuide_Region_#.php, and that it displays the appropriate animals for that region.	ZJ	Pass

3.03	At least one animal will be selected from the list in ZooGuide_Region_#.php to ensure it displays the information properly on a phone screen.	ZJ	Pass
3.04	The back button will be tested by navigating from index.php, to a ZooGuide_Region_#.php, then to a ZooGuide_AnimalResults.php page, and use only the back button to get all the way back to index.php. This only needs to be performed on one region just to ensure the links work properly.	CC	Pass
3.06	At least one random animal will be searched in general and specific formats, and one bad input will be tested.	CC	Pass
3.07	At least one random region will be selected to ensure that a picture will display on the ZooGuide_Region_#.php page.	CC	Pass

Appendix A. Test Results

Test Identifier	Evidence of Pass/Fail
1.00	Technical Requirements
1.01	 A screenshot of a web browser displaying the "HATTIESBURG ZOO MAP". The map shows the layout of the zoo with various exhibits color-coded by continent: Australia (red), Africa (orange), Asia (purple), The Americas (yellow), and Future Development (pink). Key exhibits labeled include African Savannah, Asian Forest, Australia Outback, and The Americas. The map also shows the Main Entrance, South 17th Avenue, and Hardy Street. A legend at the bottom right identifies the colors for each continent and future developments.

1.02

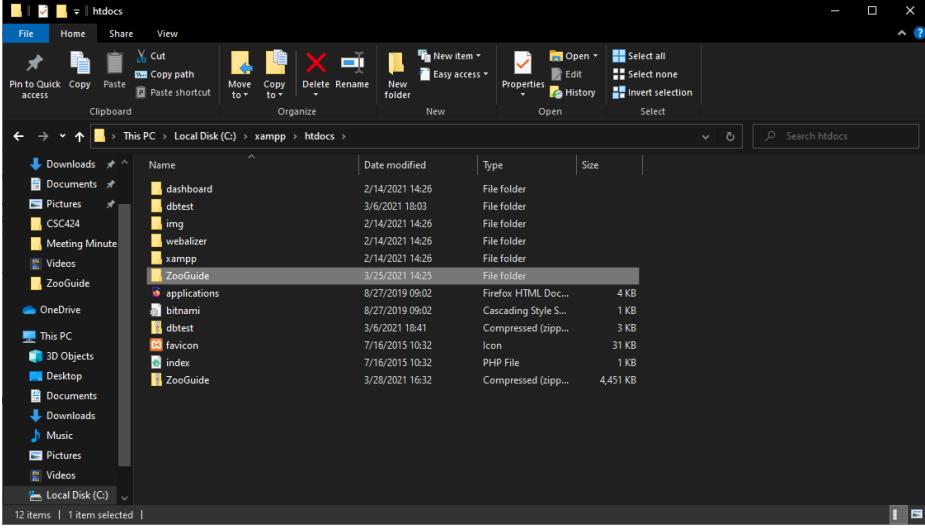
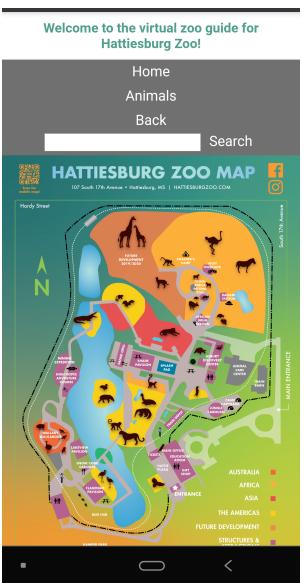
1.03

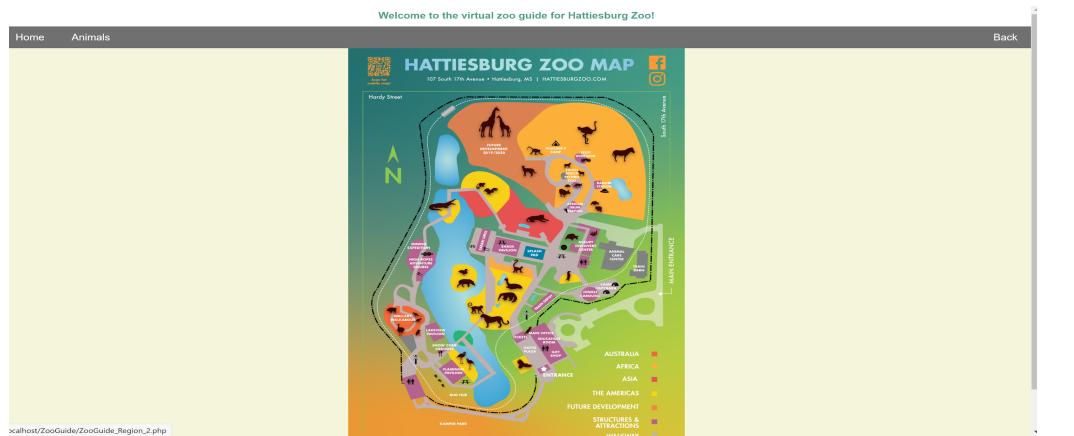
1.04

Service	Module	PID(s)	Port(s)	Actions
	Apache	3436 12076	80, 443	Stop Admin Config Logs
	MySQL	19288	3306	Stop Admin Config Logs
	FileZilla			Start Admin Config Logs
	Mercury			Start Admin Config Logs
	Tomcat			Start Admin Config Logs

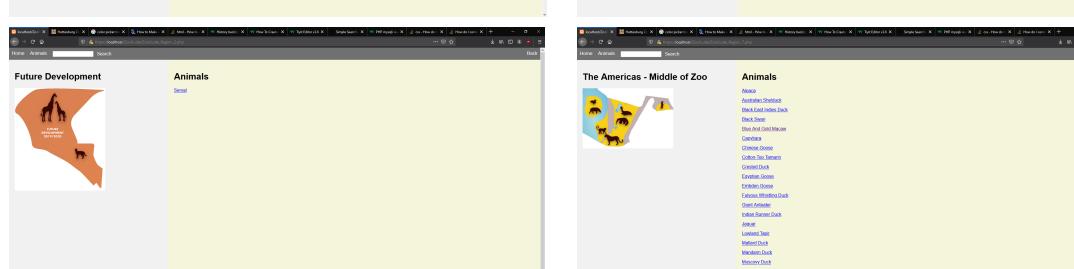
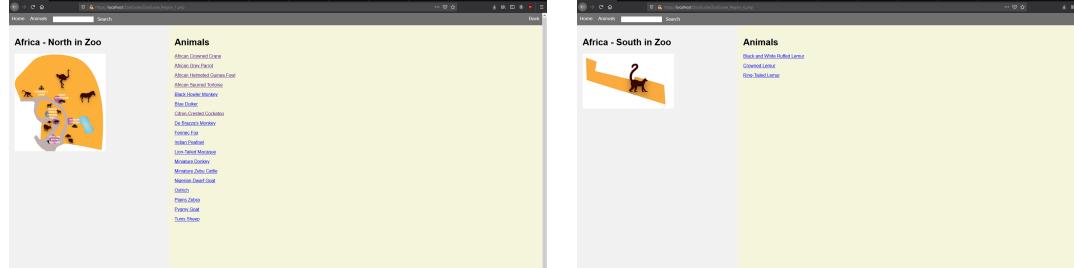
```

12:28:58 [Apache] Attempting to stop Apache (PID: 8640)
12:28:58 [Apache] Status change detected: stopped
12:28:58 [mysql] Attempting to stop MySQL app...
12:28:58 [mysql] Status change detected: stopped
12:28:59 [mysql] Attempting to start MySQL app...
12:28:59 [mysql] Status change detected: running
12:29:00 [Apache] Attempting to start Apache app...
12:29:00 [Apache] Status change detected: running
  
```

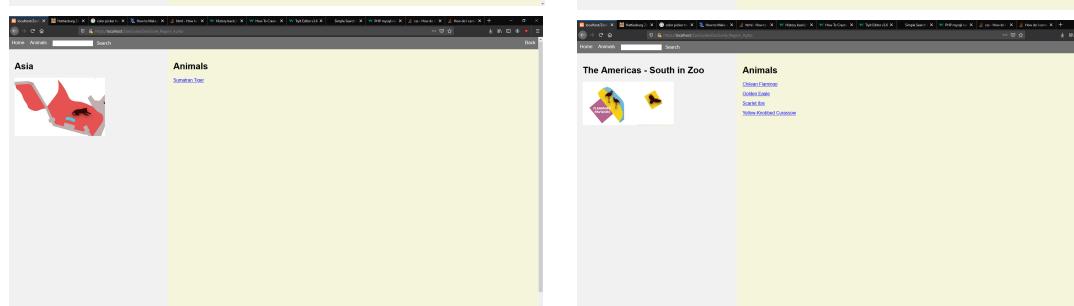
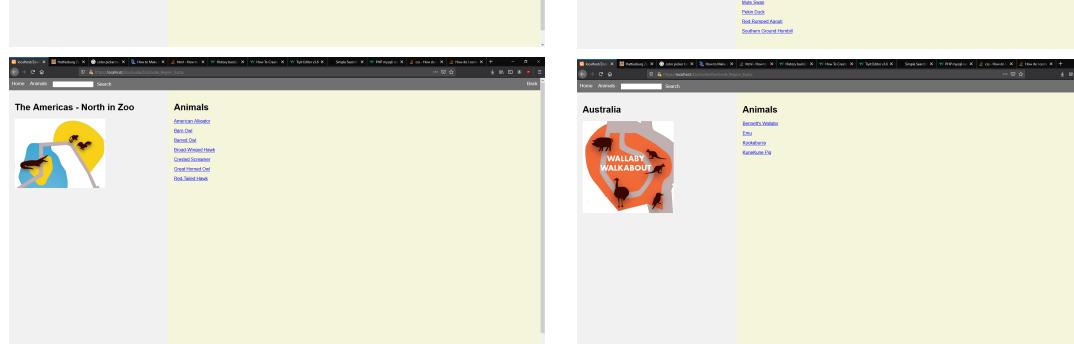
1.05	 <table border="1"> <thead> <tr> <th>Name</th><th>Date modified</th><th>Type</th><th>Size</th></tr> </thead> <tbody> <tr><td>dashboard</td><td>2/14/2021 14:26</td><td>File folder</td><td></td></tr> <tr><td>dbtest</td><td>3/6/2021 18:03</td><td>File folder</td><td></td></tr> <tr><td>img</td><td>2/14/2021 14:26</td><td>File folder</td><td></td></tr> <tr><td>webalizer</td><td>2/14/2021 14:26</td><td>File folder</td><td></td></tr> <tr><td>xampp</td><td>2/14/2021 14:26</td><td>File folder</td><td></td></tr> <tr><td>ZooGuide</td><td>3/25/2021 14:25</td><td>File folder</td><td></td></tr> <tr><td>applications</td><td>8/27/2019 09:02</td><td>Firefox HTML Doc...</td><td>4 KB</td></tr> <tr><td>bitnami</td><td>8/27/2019 09:02</td><td>Cascading Style S...</td><td>1 KB</td></tr> <tr><td>dbtest</td><td>3/6/2021 18:41</td><td>Compressed (zip...)</td><td>3 KB</td></tr> <tr><td>favicon</td><td>7/16/2015 10:32</td><td>Icon</td><td>31 KB</td></tr> <tr><td>index</td><td>7/16/2015 10:32</td><td>PHP File</td><td>1 KB</td></tr> <tr><td>ZooGuide</td><td>3/28/2021 16:32</td><td>Compressed (zip...)</td><td>4,451 KB</td></tr> </tbody> </table> <p>12 items 1 item selected</p>	Name	Date modified	Type	Size	dashboard	2/14/2021 14:26	File folder		dbtest	3/6/2021 18:03	File folder		img	2/14/2021 14:26	File folder		webalizer	2/14/2021 14:26	File folder		xampp	2/14/2021 14:26	File folder		ZooGuide	3/25/2021 14:25	File folder		applications	8/27/2019 09:02	Firefox HTML Doc...	4 KB	bitnami	8/27/2019 09:02	Cascading Style S...	1 KB	dbtest	3/6/2021 18:41	Compressed (zip...)	3 KB	favicon	7/16/2015 10:32	Icon	31 KB	index	7/16/2015 10:32	PHP File	1 KB	ZooGuide	3/28/2021 16:32	Compressed (zip...)	4,451 KB
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2.01	Testing for the page displaying a map with general directions:																																																				



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2.02





2.03

Australia

Animals

- [Bennett's Wallaby](#)
- [Emu](#)
- [Kookaburra](#)
- [KuneKune Pig](#)

Emu

Scientific name: *Dromaius novaehollandiae*
 Endangerment status: Least Concern
 Diet: Omnivore
 Animal Classification: Bird
 Region they live in: Australia
 Active time of day: Diurnal

Physical Description:
 Emus are soft-feathered, brown, flightless birds with long necks and legs, and can reach up to 1.9 metres (6.2 ft) in height.

2.04

Going to an info page:

Back to home using only 'Back' button:

Serval

Scientific name: *Leptailurus serval*
 Endangerment status: Least Concern
 Diet: Carnivore
 Animal Classification: Mammal
 Region they live in: Central and Southern Africa
 Active time of day: Nocturnal

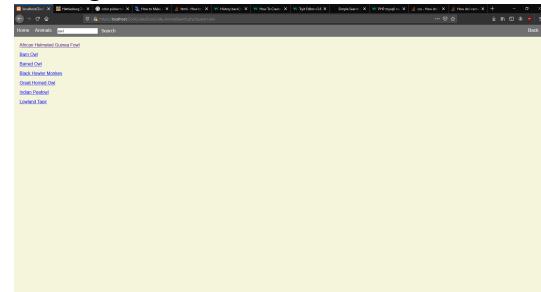
Physical Description:
 This is a medium-sized cat with long legs and a lean body. They also have a very long neck. Their coat is tawny and covered in both black lines and spots, while their bellies are soft white in color. It stands are 22 to 24 inches and weighs anywhere from 18 to 40 pounds.

What they eat:
 Small mammals, reptiles, frogs, and insects.

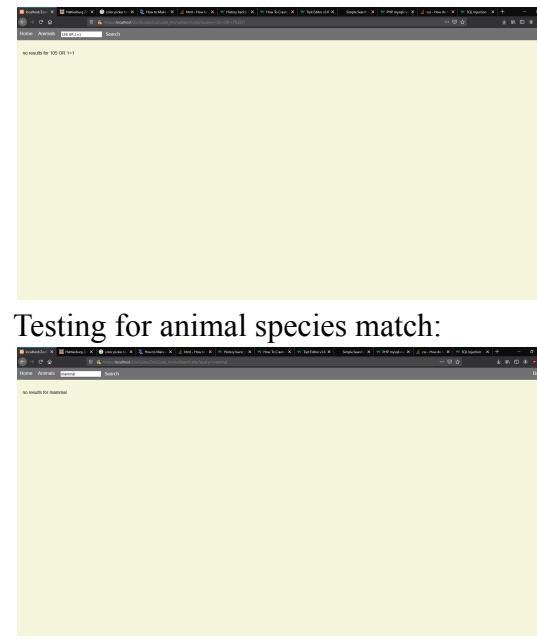
Unique Mating Habits:
 They do not have a specific breeding season. Gestation period is 68 to 72 days.

2.06

Testing normal search for ‘owl’:

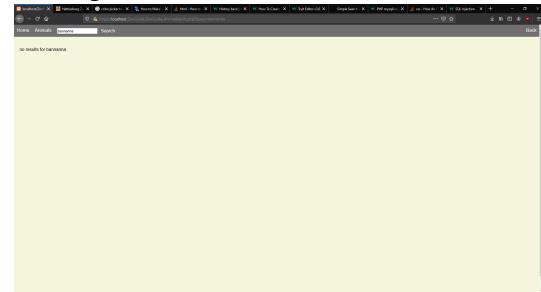


Testing to see if SQL injection will be an issue:

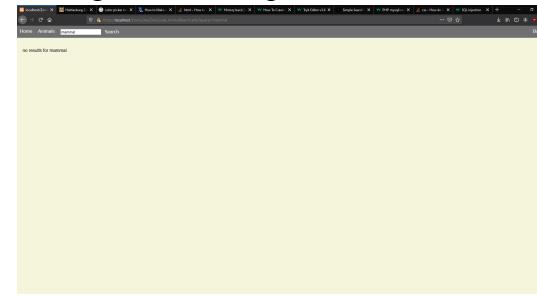


2.07

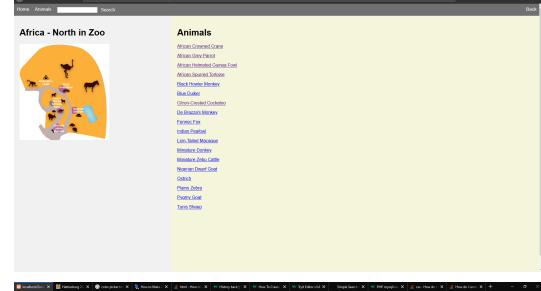
Testing for no animal match:



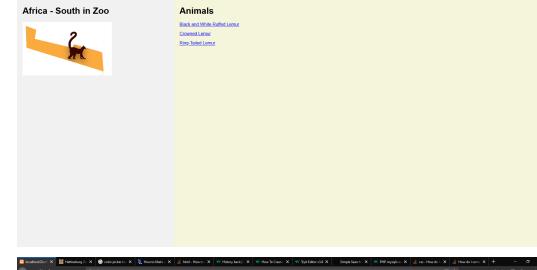
Testing for animal species match:



Index.html X NetLogo2.js X index.js



Home Animals



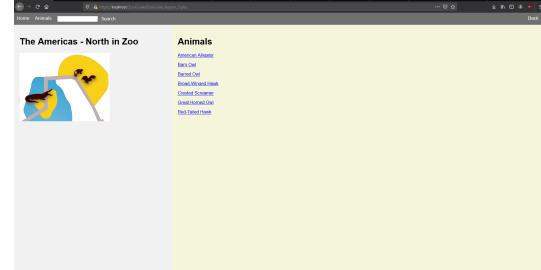
Home About



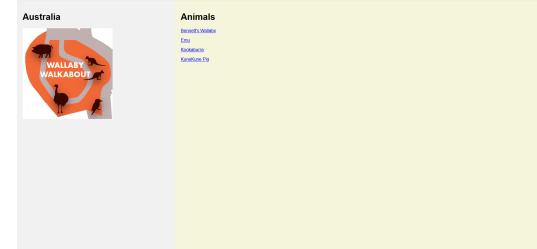
The Americas - Middle of Zoc



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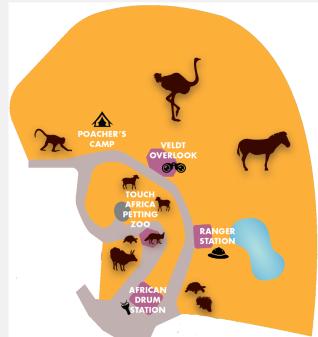
Home Animals



3.00	General Requirements on Mobile Device
3.01	

3.02

Africa - North in Zoo



Animals

[African Crowned Crane](#)

[African Grey Parrot](#)

[African Helmeted Guinea Fowl](#)

[African Spurred Tortoise](#)

3.03

African Grey Parrot



Scientific name: Psittacus erithacus

Endangerment status: Endangered

Diet: Herbivore

Animal Classification: Bird

Region they live in: Africa

Physical Description:

Their body is a dark gray color that is almost black. Their tails can vary in color from maroon to dark gray or black. They have a horn-colored beak. This parrot can be anywhere from 12 to 16 inches and weigh about its typical weight is about .88 pounds.

What they eat:

seeds, nuts, fruits, berries and vegetation

3.04

Welcome to the virtual zoo guide for Hattiesburg Zoo!

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HATTIESBURG ZOO MAP
107 South 17th Avenue • Hattiesburg, MS | HATTIESBURGZOO.COM

Adventure Awaits

Blue Duiker

Animals

- [African Crowned Crane](#)
- [African Grey Parrot](#)
- [African Helmeted Guinea Fowl](#)
- [African Spurred Tortoise](#)
- [Black Howler Monkey](#)
- [Blue Duiker](#)
- [Citron-Crested Cockatoo](#)
- [De Brazza's Monkey](#)
- [Fennec Fox](#)
- [Indian Peafowl](#)

Physical Description:
Females are slightly larger than the males. Their coloring can vary from one to another. They have short, spiky horns hidden in their hair tufts. Blue duikers have long tails, typically measuring slightly more than 10 centimeters.

What they eat:
Fallen fruits, foliage, flowers and pieces of bark

Unique Mating Habits:
The blue duiker will breed all throughout the year. Typically, they will remain paired for life.

Blue Duiker

Animals

- [African Crowned Crane](#)
- [African Grey Parrot](#)
- [African Helmeted Guinea Fowl](#)
- [African Pygmy Hedgehog](#)
- [African Spurred Tortoise](#)
- [Alpaca](#)
- [American Alligator](#)
- [Argentine Black and White Tegu](#)
- [Australian Shelduck](#)
- [Axolotl](#)
- [Ball \(Royal\) Python](#)
- [Barn Owl](#)
- [Barred Owl](#)
- [Bearded Barbet](#)
- [Bearded Dragon](#)
- [Bennett's Wallaby](#)
- [Black and White Ruffed Lemur](#)
- [Black East Indies Duck](#)

Welcome to the virtual zoo guide for Hattiesburg Zoo!

Home Animals Back Search

HATTIESBURG ZOO MAP
107 South 17th Avenue • Hattiesburg, MS | HATTIESBURGZOO.COM

Hardy Street South 17th Avenue
MAIN ENTRANCE
AUSTRALIA ■
AFRICA ■
ASIA ■
THE AMERICAS ■
FUTURE DEVELOPMENT ■
STRUCTURES & ATTRACTIONS ■
WALKWAY ■
RAILROAD TRACKS ■
PERIMETER ■
ADVENTURE AWAITS

3.06

Welcome to the virtual zoo guide for Hattiesburg Zoo!

Home Animals Back Search

Tiger

HATTIESBURG ZOO MAP
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Hardy Street South 17th Avenue
MAIN ENTRANCE
AUSTRALIA ■
AFRICA ■
ASIA ■
THE AMERICAS ■
FUTURE DEVELOPMENT ■
STRUCTURES & ATTRACTIONS ■
WALKWAY ■
RAILROAD TRACKS ■
PERIMETER ■
ADVENTURE AWAITS

Home Animals Back Search

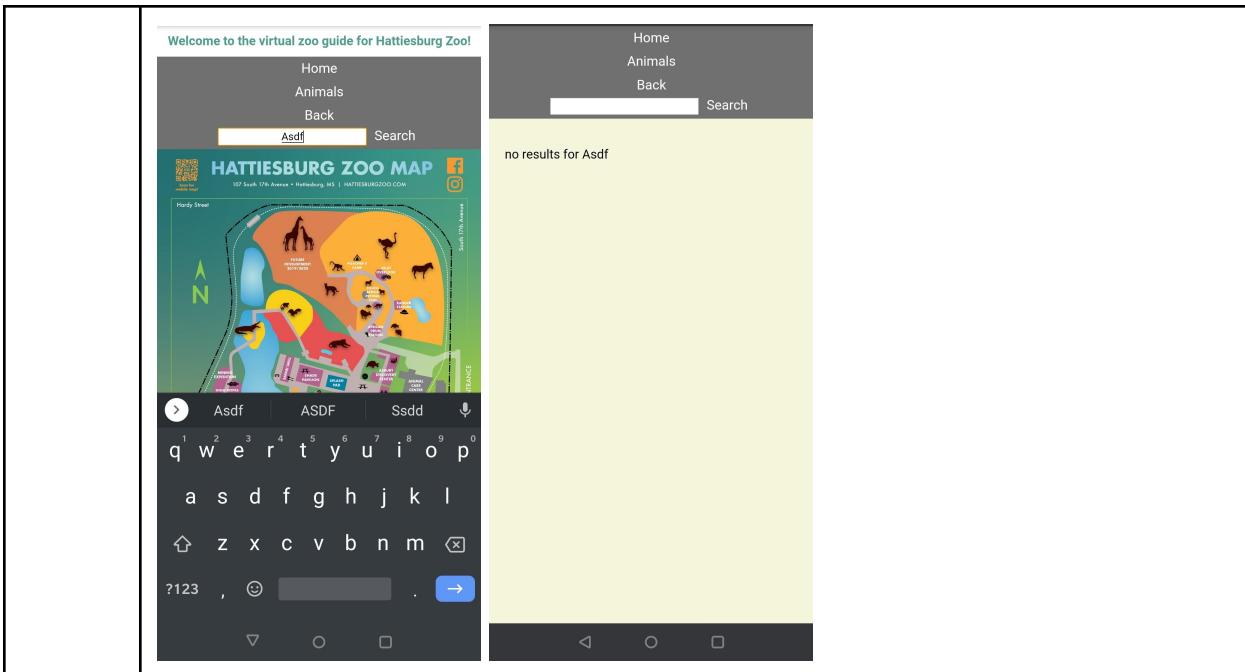
Sumatran Tiger

Scientific name: *Panthera tigris sumatrae*
Endangerment status: Critically Endangered
Diet: Carnivore
Animal Classification: Mammal
Region they live in: Indonesia
Environment they live in: sub-mountain and mountain forest to lowland forest and peat forest
Active time of day: Nocturnal

Physical Description:
This species of tiger is the smallest and darkest subspecies of the tigers. They tend to be more maned and bearded than other tiger species. Its coat is covered in very thin stripes which help it to camouflage itself.

What they eat:
fish, monkeys, wild boar, tapirs, deer, etc.

Unique Mating Habits:
Mating can take place at any time of the year, but most often it happens between November and April. Males and females will only meet with each other to mate, but



3.07

Animals	
African Crowned Crane	
African Grey Parrot	
African Helmeted Guinea Fowl	
African Spurred Tortoise	
Black Howler Monkey	
Blue Duiker	
Citron-Crested Cockatoo	
De Brazza's Monkey	
Fennec Fox	
Indian Peafowl	
Lion-Tailed Macaque	
Miniature Donkey	
Miniature Zebu Cattle	
Nigerian Dwarf Goat	
Ostrich	
Plains Zebra	
Pygmy Goat	
Tunis Sheep	

zoo_region	common_name	▲
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