CIS 551: Databases Final Project
Database of Climbing Routes

Steven Walton

November 20, 2019

In this database we try to store information relevant to climbers when seeking out routes to climb. We also give climbers the ability to store which climbs they have done and to rate the climbs, both in difficulty and how much they enjoy it.

Information that we find relevant to climbers include the location of the routes – including the global location, what state it is in, and what climbing area it is (e.g. Smith Rock or Red Stone) – the difficulty of the climb, the type of climb, how other climbers think the climb is ("likeability"), a description of how to get there (approach), and a description of the climb itself, will be available and several attributes will be adjustable for climbers. This adjustable data will include climbers being able to vote on the difficulty of the climb, how much they like it, and allows users to upload pictures. Attributes like climbing difficulty and "likeability" are subjective and therefore it is best to aggregate this data and display the average result to users. Additionally, users will be able to submit new routes.

A single climbing route can be composed of one or more pitches, which are half the length of a standard rope. A route's overall difficulty is determined by the highest difficulty rating of a single pitch, but information about individual pitch difficulty is given so that climbers can best determine how to take breaks and if they have adequate endurance for the climb. A pitch may be shared between multiple routes. Some routes may be a single pitch, where a climber can then just lower back to the ground. Other routes may continue from that pitch into a more challenging route, or multiple routes my cross paths and share pitches. Additionally, climbers need information about what gear they need for the climb. There are three main subtypes: top-rope, sport, and trad.

We will be using the American standard of the Yosemite Decimal System to express the difficulty of climb. This database will only consider climbs that require a rope, which means that the leading integer value will always begin with a "5". The decimal values range from 1 (5.1) to 15 (5.15). Because of this we will only consider the range 1 to 15 given in a climbing rating and treat these values as integers. Difficulties above a 5.10 have sub alphabetic classifications ranging from "a" to "d", i.e. 5.10a, 5.10b, 5.10c, 5.10d express the entire range of 5.10 climbs. These alphabetic classifications will be expressed as the decimal representations within the database with a value of 0.25 each. In this manner we can express an average between

values that climbers rank. For example, one climber may rate a pitch as a 5.12a and another climber can rate the pitch as a 5.11c. These would respectively by 12.0 and 11.5, respectively, giving an average rating of 11.75, which will be converted to a 5.11d rating. We will use a ceiling function for the averages, so that we error on the side of assigning a more difficult rating to a pitch. Likeability of the climb will be expressed in the range of 1 to 10, and the floor of the average rating will be displayed.

With this information climbers will be able to determine which routes that they want to climb and what gear to bring. Climbers will also be able to use this database to search out climbs that they may find enjoyable. The website will enable climbers to search through the database, including: finding routes by area, finding routes by difficulty, likeability, number of pitches, or a combination of these. Additionally climbers will be able to navigate through the website based on the hierarchy of the routes. This hierarchy is the hemisphere, country, state, area, and route. These pages will themselves have information and links to the next element in the hierarchy. For example by clicking on Area climbers will be presented with a list of routes in that area or if a climber clicks on a country they will be given a list of states that have routes in the database. Pitches will not be given their own page.

Country
- idCountry INT
- hemisphere VARCHAR(45)
- Indexes

State
- idState INT
- idCountry VARCHAR(255)
- Country_idCountry INT
- Indexes

Site
- idSite INT
- idState INT
- name VARCHAR(255)
- State_idState INT
- Indexes

Route
- idRoute INT
- type VARCHAR(45)
- numPitches INT
- approach VARCHAR(255)
- description VARCHAR(255)
- name VARCHAR(255)
- idSite INT
- Area_idArea INT
- difficulty FLOAT
- likability INT
- Indexes

Users
- idUsers INT
- name VARCHAR(255)
- State_idState INT
- Indexes

Completed
- Route_idRoute INT
- Users_idUsers INT
- Indexes

Area
- idArea INT
- 2 more...
- Indexes

Route_has_Pitch
- Pitch_idPitch INT
- Route_idRoute INT
- Indexes

Pitch
- idPitch INT
- idRoute INT
- length INT
- difficulty FLOAT
- rating FLOAT
- pitchNum INT
- Indexes

Route_has_Pictures
- Route_idRoute INT
- Pictures_idPictures INT
- Indexes

Pictures
- idPictures INT
- pictureURL VARCHAR(255)
- uploadedBy INT
- Indexes

2