

COMP/EECE 7012

# Exam 1

Spring 2016

Name: Solutions \_\_\_\_\_ , \_\_\_\_\_  
Last name First name

## Rules:

- No potty breaks.
- Turn off cell phones/devices.
- Closed book, closed note, closed neighbor.
- WEIRD! Do not write on the backs of pages. If you need more pages, ask me for some.

## Reminders:

- Verify that you have all pages.
- Don't forget to write your name.
- Read each question carefully.
- Don't forget to answer every question.

1. [2pts] Which of these terms best describes Git?

- a) Integrated Development Environment
- b) Distributed Version Control System
- c) Issue Tracking System
- d) Web-Based Repository Hosting Service
- e) None of the above

2. [2pts] Which of the following problems does Git help solve?

- a) Recovering older versions of a software project
- b) Developing multiple versions of a software project in parallel
- c) Merging changes to a software project made by collaborating developers working in parallel
- d) All of the above
- e) None of the above

3. [2pts] Which of these terms best describes GitHub?

- a) Integrated Development Environment
- b) Distributed Version Control System
- c) Issue Tracking System
- d) Web-Based Repository Hosting Service
- e) None of the above

Consider the following list of Git commands:

- |                            |                              |
|----------------------------|------------------------------|
| a) <code>git init</code>   | f) <code>git branch</code>   |
| b) <code>git push</code>   | g) <code>git clone</code>    |
| c) <code>git add</code>    | h) <code>git checkout</code> |
| d) <code>git merge</code>  | i) <code>git status</code>   |
| e) <code>git commit</code> | j) <code>git pull</code>     |

Giada has just joined a team of developers collaboratively working on a restaurant management web app called *DineOh*. The code for the project is housed in a GitHub repo. All work for the project is being done on the “master” branch (no other branches).

4. [2pts] Giada wants to get a local copy of the code and repo, so she can begin contributing to the project. Which command(s) from the above list should she run?

g

5. [2pts] Giada does some work on the project, but then, she is suddenly called upon to fix a critical bug in another project. She is distracted by this debugging task for a couple days. When she finally returns to the DineOh project, she cannot remember if she saved her edits to the local repo. Which command(s) from the above list should she run to determine whether or not she saved her edits?

i

6. [2pts] The command tells her that she had only edited the files, but not run any other Git commands since doing so. Which command(s) from the above list should she run to save her edits to the local repo?

c, e

7. [2pts] Having saved to her local repo, she would now like to share her work with the rest of the team (via GitHub). Which command(s) from the above list should she run?

b

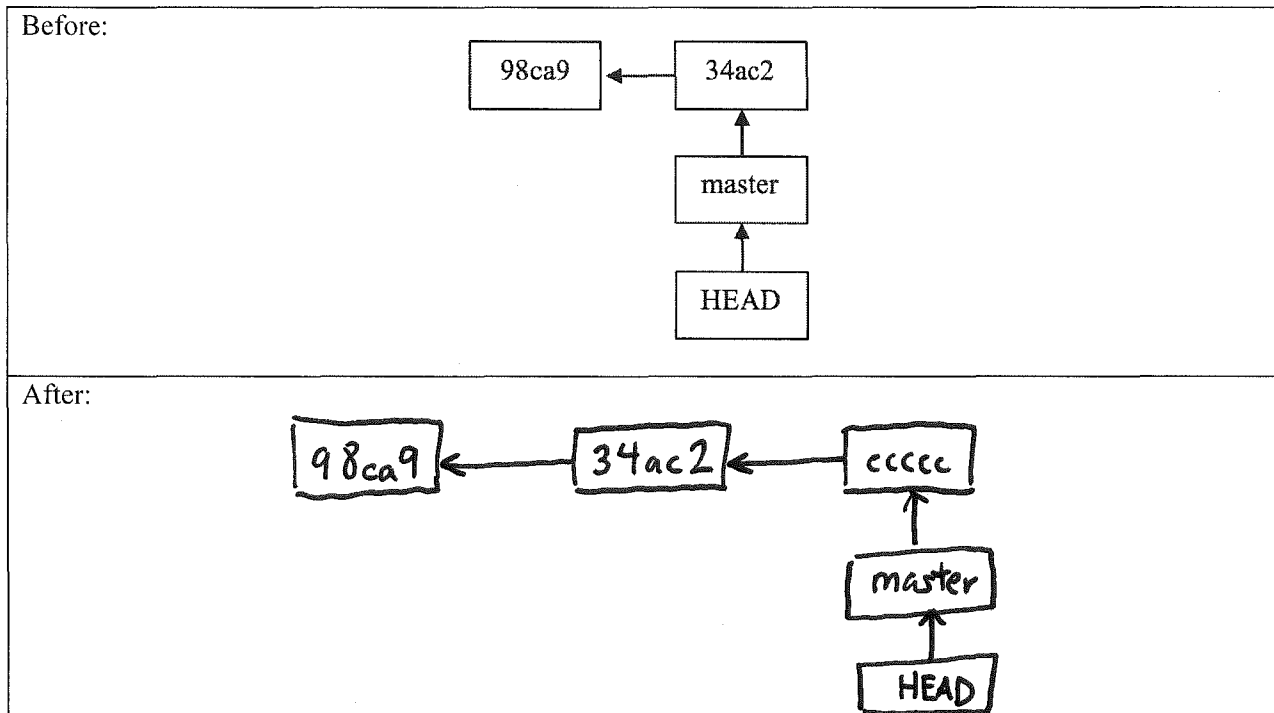
When she runs the command(s), she gets this message (with words that give away the answers hidden):

```
To https://github.com/.../dineoh.git
! [rejected]      master -> master (fetch first)
error: failed to ████████ some refs to 'https://github.com/.../dineoh.git'
hint: Updates were rejected because the remote contains work that you do
hint: not have locally. This is usually caused by another repository ████████ing
hint: to the same ref. You may want to first integrate the remote changes
hint: (e.g., 'git ████████ ...') before ████████ing again.
hint: See the 'Note about fast-forwards' in 'git ████████ --help' for details.
```

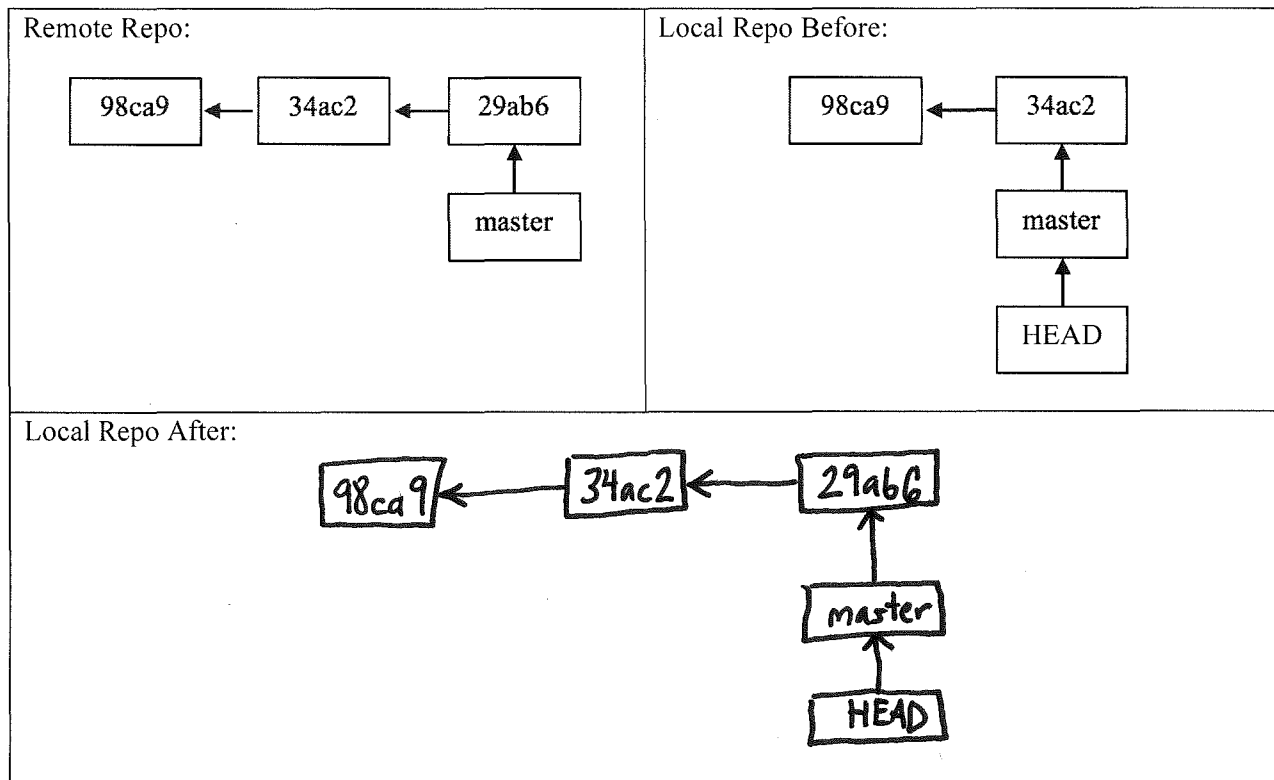
8. [2pts] Giada wants to resolve this issue, so she can upload her changes. Which (one) command from the above list should she run next?

j

9. [4pts] Draw the state of the pictured repository after a Git **commit** operation (make up a hash).

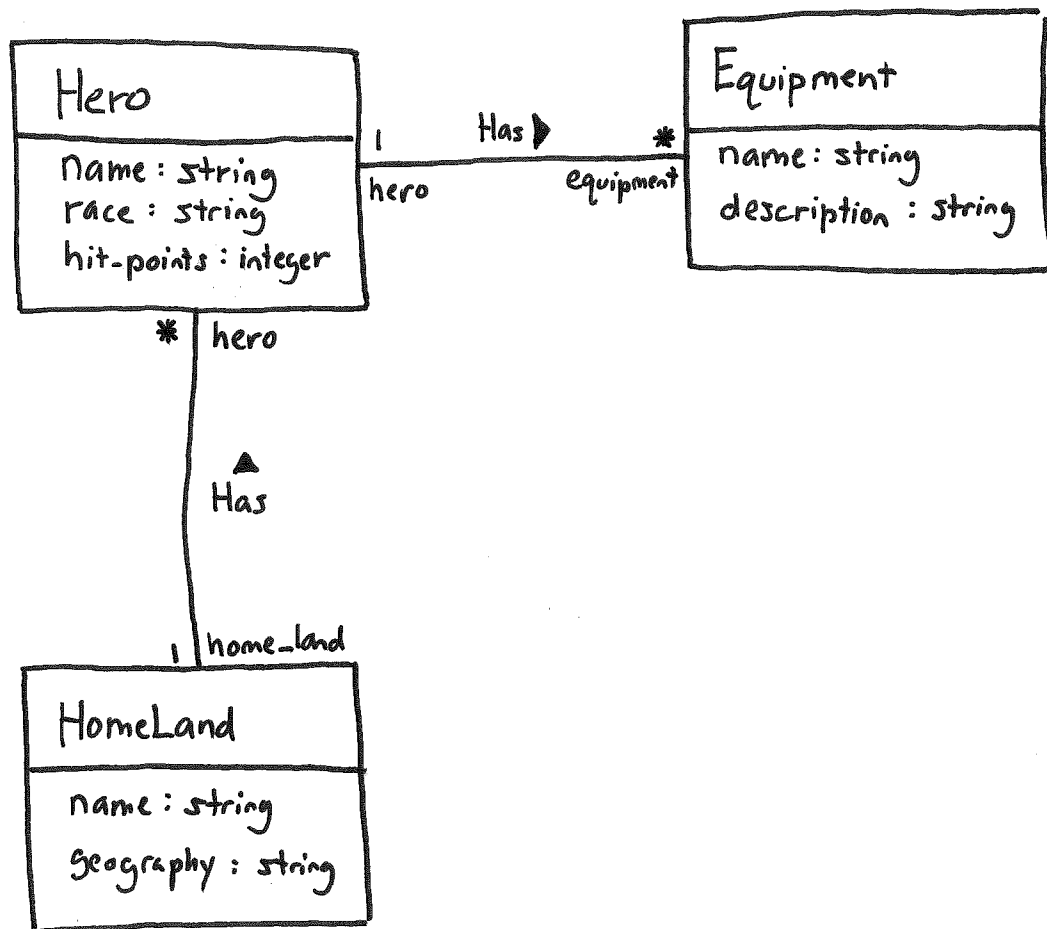


10. [4pts] Draw the state of the local repository after a Git **pull** operation.



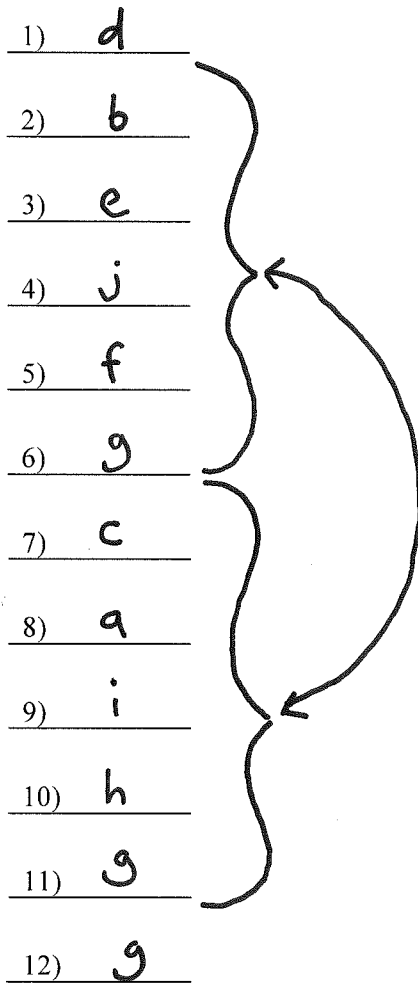
The questions on the following pages refer to the example figures. The figures show different aspects of the *Warrior World* web app that is a roleplaying adventure game thematically similar to *Dungeons & Dragons* and *World of Warcraft*. In the game, users play as heroes, each with his/her own back story (e.g., land of origin) and special weapons and equipment.

11. [10pts] Draw a UML class diagram that represents the three model classes given in Figure 1. Be sure to label all associations and association ends, and include all multiplicities. Don't include any "id" attributes (including foreign keys). You may also omit the "datetime" attributes that Rails provides by default.



12. [6pts] Consider the validations in the Hero class (Figure 1) and the Hero fixtures in Figure 2. Using the following lines of code, create a class with two test cases—one that tests that name is present and the other that tests that hit\_points are 0 or greater. You should use all lines at least once, and some lines may be used more than once.

- a) `archimonde = heros(:archimonde)`
- b) `test "hit points should be greater than or equal to 0" do`
- c) `test "name should not be empty" do`
- d) `class HeroTest < ActiveSupport::TestCase`
- e) `alice = heros(:alice)`
- f) `assert alice.invalid?`
- g) `end`
- h) `assert archimonde.invalid?`
- i) `archimonde.name = nil`
- j) `alice.hit_points = -1`



13. [9pts] Consider the Hero *show* page in Figure 3. Using the following lines of code, reverse engineer the view code that produced this page. You should use all lines at least once, and some lines may be used more than once.

- a) <%= @hero.race %>
- b) </h2>
- c) <li> <%= equipment.name %> </li>
- d) <ul>
- e) </ul>
- f) <h1><%= @hero.name %></h1>
- g) <p id="notice"><%= notice %></p>
- h) <% @hero.equipment.each do |equipment| %>
- i) from
- j) <%= link\_to 'Back', heros\_path %>
- k) (<%= @hero.hit\_points %> HP)
- l) <% end %>
- m) <%= @hero.home\_land.name %>
- n) Equipment:
- o) <h2>
- p) </h3>
- q) <h3>
- r) <%= link\_to 'Edit', edit\_hero\_path(@hero) %> |

1) g

10) n

2) F

11) P

3) O

12) d

4) a

13) h

5) i

14) c

6) m

15) l

7) K

16) e

8) b

17) r

9) q

18) j

14. [2pts] Which of the following routes corresponds to the *show* page in Figure 3?

- a) `get '/heros', to: 'heros#index', as: 'heros'`
- b) `get '/heros/:id/edit', to: 'heros#edit', as: 'edit_hero'`
- c) `get '/heros/:id', to: 'heros#show', as: 'hero'`
- d) `patch '/heros/:id', to: 'heros#update'`
- e) `post '/heros', to: 'heros#create'`

15. [2pts] Which of the following lines of code would the controller need to execute before rendering the view from Question 13?

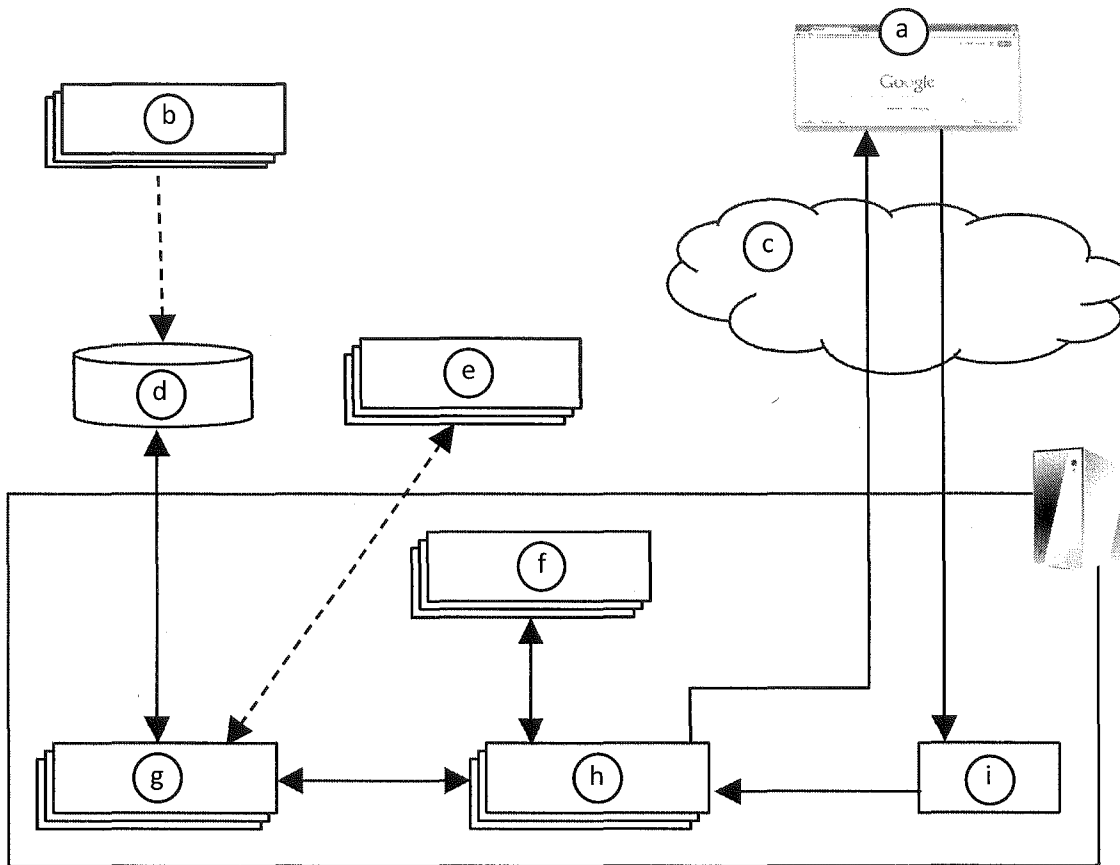
- a) `@heros = Hero.all`
- b) `@hero = Hero.new`
- c) `@hero = Hero.new(params.require(:hero).permit(:name, :race, :hit_points))`
- d) `@hero = Hero.find(params[:id])`
- e) None of the above

16. [1pt] True or false? State-affecting controller actions (such as create, update, and destroy) should always send an HTTP redirect response instead of rendering a view.

- a) True
- b) False



Consider this architectural diagram in answering the following questions.



17. [2pts] Which letter in the diagram corresponds to the code in Figure 1?

g

18. [2pts] Which letter in the diagram corresponds to the code in Question 12?

e

19. [2pts] Which letter in the diagram corresponds to the code in Question 13?

f

20. [2pts] Which letter in the diagram corresponds to the code in Question 14?

i

21. [2pts] Which letter in the diagram corresponds to the code in Question 15?

h (will also accept g,h)

22. [2pts] What are the M components in MVC responsible for?

- a) Responsible for user interface
- b) Responsible for security of the system
- c) Responsible for “business logic” and domain objects
- d) Responsible for translating between user interface actions/events and operations on the domain objects
- e) None of the above

23. [2pts] What are the V components in MVC responsible for?

- a) Responsible for user interface
- b) Responsible for security of the system
- c) Responsible for “business logic” and domain objects
- d) Responsible for translating between user interface actions/events and operations on the domain objects
- e) None of the above

24. [2pts] What are the C components in MVC responsible for?

- a) Responsible for user interface
- b) Responsible for security of the system
- c) Responsible for “business logic” and domain objects
- d) Responsible for translating between user interface actions/events and operations on the domain objects
- e) None of the above

## Figures

```
# == Schema Information
#
# Table name: heros
#
# id          :integer          not null, primary key
# name       :string
# race       :string
# hit_points  :integer
# created_at  :datetime         not null
# updated_at  :datetime         not null
# home_land_id :integer
#

class Hero < ActiveRecord::Base
  has_many :equipment
  belongs_to :home_land

  validates :name, presence: true
  validates :race, presence: true
  validates :hit_points, numericality: { greater_than_or_equal_to: 0 }
end

# == Schema Information
#
# Table name: equipment
#
# id          :integer          not null, primary key
# name       :string
# description :string
# created_at  :datetime         not null
# updated_at  :datetime         not null
# hero_id    :integer
#

class Equipment < ActiveRecord::Base
  belongs_to :hero

  validates :name, presence: true
  validates :description, presence: true
end

# == Schema Information
#
# Table name: home_lands
#
# id          :integer          not null, primary key
# name       :string
# geography   :string
# created_at  :datetime         not null
# updated_at  :datetime         not null
#

class HomeLand < ActiveRecord::Base
  has_many :hero

  validates :name, presence: true
  validates :geography, presence: true
end
```

Figure 1. Three model classes from Warrior World.

```
alice:
  name: Alice the Fire Angel
  race: Human
  hit_points: 88

archimonde:
  name: Archimonde the Defiler
  race: Orcs
  hit_points: 108
```

Figure 2. Test fixture for class Hero.

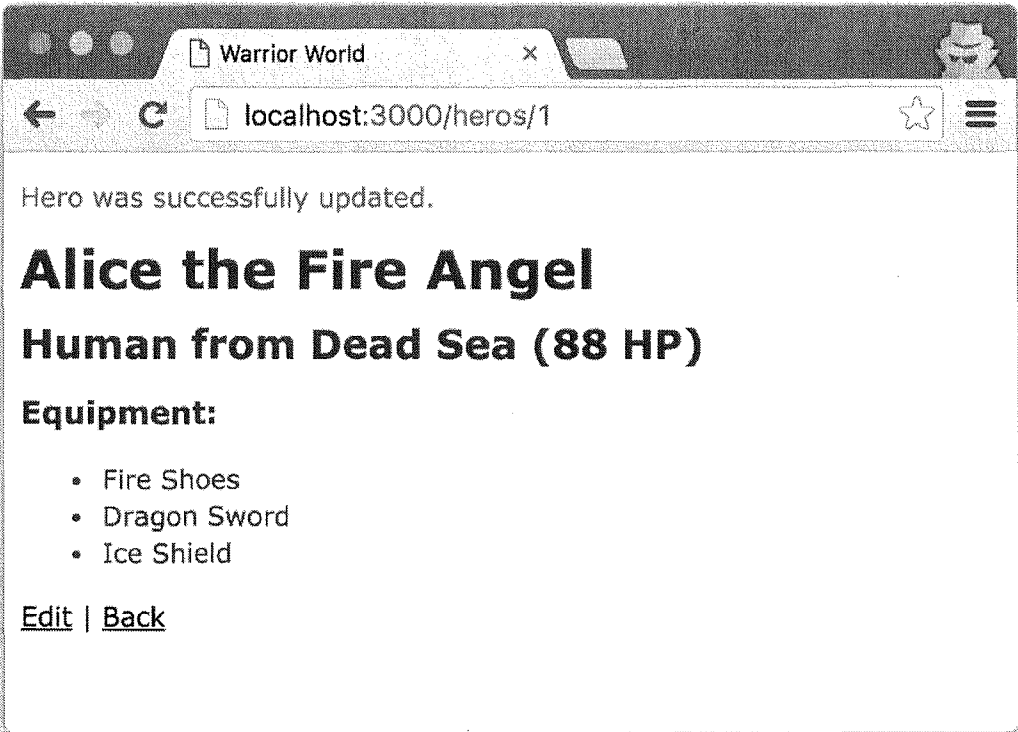


Figure 3. Hero show page.