

Regional ICT Skills Championship 2020

Application Development

SAMPLE TASK

Regional ICT Skills Championship 2020

1 Instructions

1.1 Introduction

This document describes the tasks to be performed for the Regional ICT Skills Championship 2020 in the category Application Development. We advise you to read this document carefully and to have an overview of the provided media like attached images and text. To complete the tasks, you are free to use whichever of the provided tools you like.

You could find yourself in the situation that there is not enough time to complete all remaining tasks. You can skip the implementation of certain tasks in favor for others. However, it is expected that you deliver a smoothly running application at the end of the competition to facilitate the assessment of your work.

Unless it was specified otherwise by your supervisor, you should find the required data and documents on the **Desktop** of your virtual machine.

1.2 Rules

Please comply with the following rules throughout the competition:

- Accessing the internet is not allowed
- The use of any communication device is prohibited (mobile, tablet, etc.)
- The use of your own storage devices is prohibited (USB sticks / hard disks, etc.)
- Communication between other candidates is prohibited
- You are not allowed to bring books, notes, etc. to the competition

The non-compliance with these rules may result in the disqualification from the competition.

1.3 Evaluation

Each task is rated by testing the implementation of the required functionality. In addition, the following criteria applies to all tasks and must match your solution:

- All written code must be properly formatted;
- SQL queries must be protected from any possible injections;
- No error should occur / proper exception handling is implemented;

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1.4 Deliverables

All deliverables must be submitted in a zip file named "AppDev_Name_FirstName.zip" and it must be placed at the folder location indicated by the supervisor. The deliverables are **executable files, source code** and the **database** (db-files, backup or SQL-export). Please also fill out the requested information in the file **registrationForm.docx** and include it in the zip file.

At the end of the competition you must also submit all documents and notes to the supervisor.

Only the contents of the zip file will be considered for the evaluation of the work. Only electronically delivered notes (*readme.txt or readme.rtf*) will be considered for evaluation. Notes on this document will not be used for the evaluation.

1.5 Tools

A System with the following software configuration will be provided to you to develop your application:

- Java
 - JDK 13
 - JavaFX SDK 13
 - IntelliJ IDEA Community Edition 2019.3
 - NetBeans 11.2
 - Eclipse 2020-03
 - JavaFX Scene Builder 11
- .NET
 - .Net Core 3.1
 - Visual Studio Community 2019 (16.4)
- Databases
 - Microsoft SQL Server 2019 Express
 - JDBC Driver
 - Management Studio 18.4
 - MySQL 8
 - JDBC / .NET Connector
 - Workbench
- LibreOffice 6.2
- Adobe Reader DC
- Notepad++
- Windows 10

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2 Project Introduction

Your task is to implement a gaming-tournament-management-application, that can be used by a tournament manager to keep the tournament organized.

3 Overview

The application starts in the “Tournament List”-window. From there the user can view existing tournaments or create new tournaments. The “Tournament Overview” allows to manage the participants and the matches.

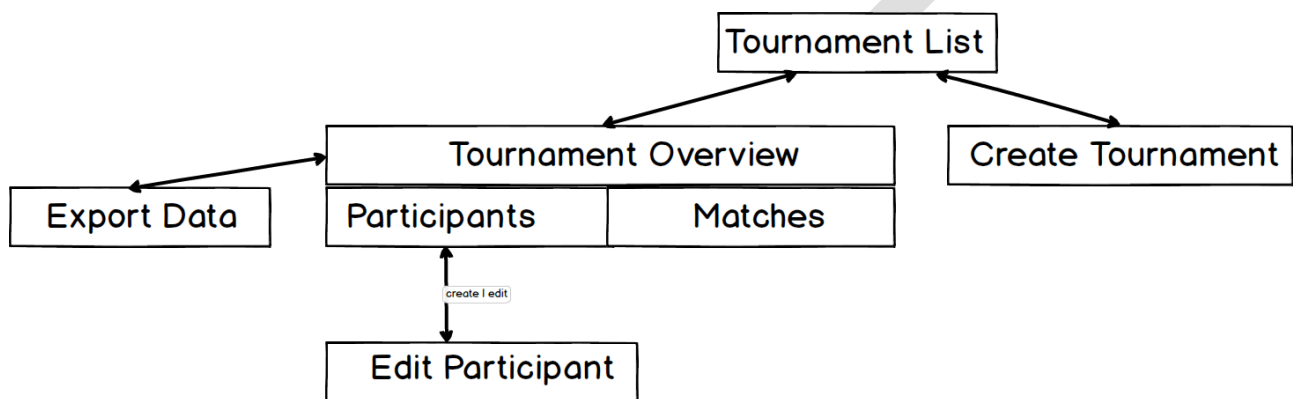


Figure 1: Application Overview

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4 Requirements

4.1 Database

Please use the prepared database (name: ictskills) on the MySQL or MS-SQL server running on your virtual machine. The database should be used to save all the applications data and is already prepared with the table structures and data needed for this project. The tables are described in this chapter.

If you need to restore the tables to the initial state, use the script *tourctrl_mssql.sql* or *tourctrl_mysql.sql*

You'll find the connection information on the desktop (Database User and Password.txt). Sample code, that shows how to connect to the different databases, can be found in the folder Examples.

4.1.1 Table Tournament

This table is used to store the all tournaments with the following fields:

Field Name	Description
ID	Primary key
Title	Title of the tournament
GameID	ID of the game that is played this tournament
Size	Number of participants that can join the tournament.
WinnerParticipantID	ID of the winner of the tournament.
TournamentState	Stores the state of the tournament. Use the following Values: 0: (default) not started 1: started 2: finished

Table 1: Table Tournament

4.1.2 Table Game

This table is used to store all supported games:

Field Name	Description
ID	Primary key
Name	Name

Table 2: Table Game

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4.1.3 Table Participant

This table is used to store all participants:

Field Name	Description
ID	Primary key
Name	Name
IsTemporary	A temporary participant gets deleted from the DB when it gets removed from a tournament (see Table ParticipantInTournament). Whereas a non-temporary participant remains in the DB if he gets removed from the tournament.
IsTeam	Is Participant a player or a team?

Table 3: Table Participant

4.1.4 Table ParticipantInTournament

This table is used to store all participants to tournament relationships:

Field Name	Description
ID	Primary key
TournamentID	ID of tournament
ParticipantID	ID of participant

Table 4: Table ParticipantInTournament

4.1.5 Table Match

This table is used to store all matches.

Field Name	Description
ID	Primary key
TournamentID	ID of tournament
Participant1ID	ID of first participant
Participant2ID	ID of second participant
Stage	Number of the stage in tournament
Order	Number of the match in stage
WinnerParticipantID	ID of the winner of the match

Table 5: Table Match

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4.2 Tournament List

- The Tournament List is the first window to be shown.
- Implement a table which lists all tournaments including columns for Game und the Winner name.
- If there is no winner for a tournament, display “undecided”.
- The button “+ Tournament” should display the “Edit Tournament”-window
- The button “View” opens the “Tournament Overview” for the selected tournament.
- If no tournament is selected the button “View” should be disabled.
- Place the image header.png in the header of this window.

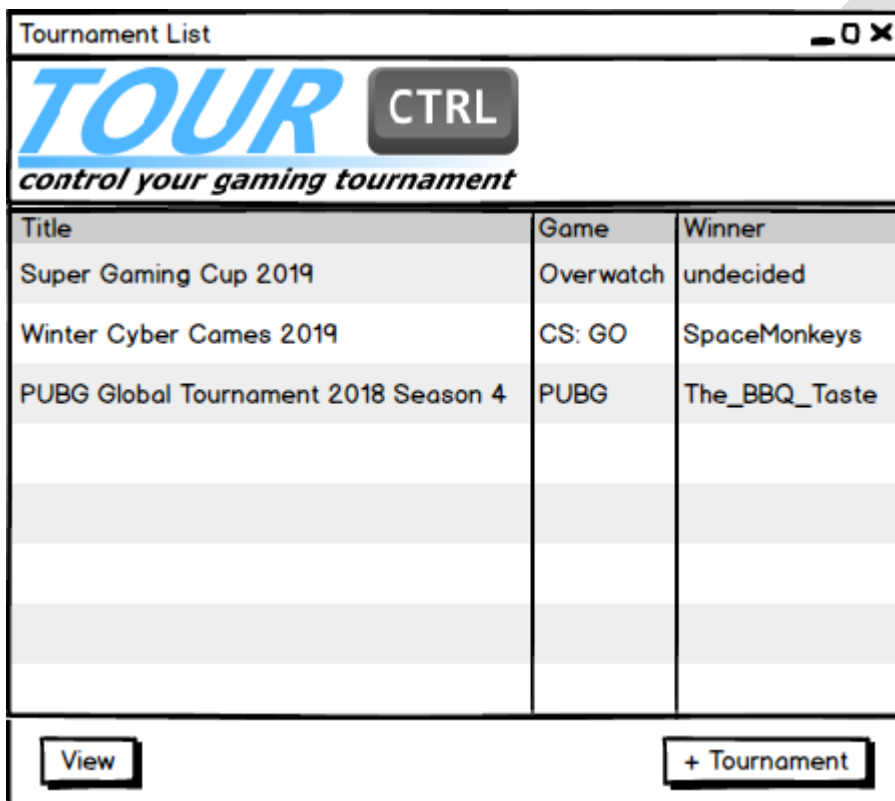


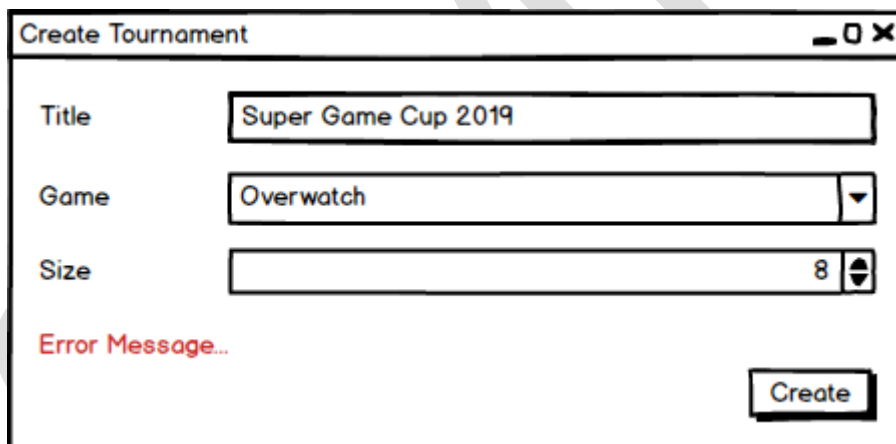
Figure 2: Mockup: Tournament List

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4.3 Create Tournament

The “Create Tournament”-window is used to create tournaments.

- Title
 - Create a textbox to allow the user to enter a title for the tournament
 - Validation: the title should not be empty or whitespace
- Game
 - Create a dropdown list to allow the user to select a game from the database
 - Validation: a game must be selected
- Size
 - Create a numeric input-field to allow the user to set the size of the tournament. The size determines how many participants can join the tournament.
 - Validation: The value must be between 2 to 100
- Error Message
 - If the form is not valid, display an appropriate error message.
 - The error message color should be red
- Create button
 - “Create” should create the tournament with the given data, if the input is valid.
 - Also pressing “Enter” should submit the form.



The mockup shows a window titled "Create Tournament" with the following elements:

- Title:** A text input field containing "Super Game Cup 2019".
- Game:** A dropdown menu with "Overwatch" selected.
- Size:** A numeric input field with "8" and a spinner control.
- Error Message:** A red text label that says "Error Message...".
- Create:** A button labeled "Create" at the bottom right.

Figure 3: Mockup: Create Tournament

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4.4 Tournament Overview

The “Overview” includes all tournament-related tools.

- Basic Information: The basic information should display following info (as it is shown in the mockup)
 - Tournament Title
 - Game
- Create a Tab-control with a tab called “Participants” and a tab called “Matches”
- Create a Button which allows the user to export the tournament results. See chapter “4.8 Export Data” for specification.
- Place the image header.png in the header of this window.

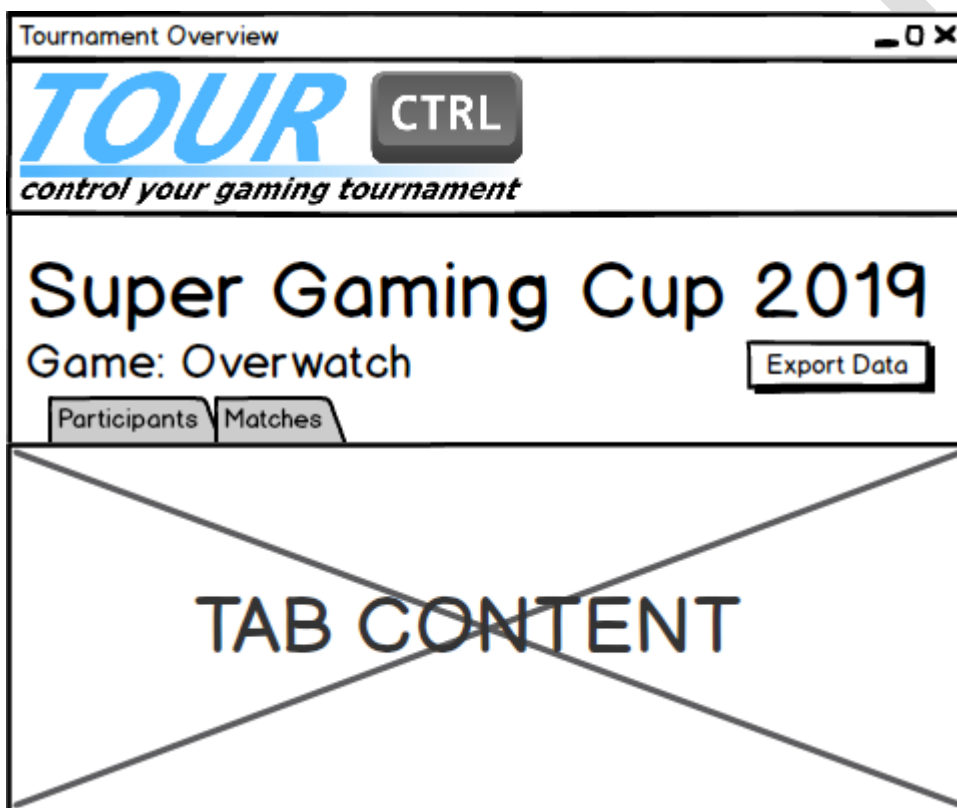


Figure 4: Mockup: Tournament Overview

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4.5 Participants Tab

The “Participants Tab” is shown in the “Tournament Overview”. It shows all registered participants and allows the user to add more participants or edit and remove existing participants. Changing the participants is only allowed, if the tournament has not started.

- In the top section of the tab, add numbers with a large font size to indicate...
 - how many participants already are registered
 - what the size of the tournament is
- The participants number should update automatically, as soon as new participants are added or removed
- Create a list which shows all registered participants of this tournament
- Create the buttons as they are in the mockup, at the bottom of the tab
- “+ Participant” should open the “Edit Participant”-window with empty data to create a new participant.
- “Fill Random” should fill the list with temporary participants, so that the number of registered participants is equals to the tournament size.
- The name of “Fill Random”-created participants should be “Participant #n” where n starts at 1 and increments for each created participant.
- Randomly created participants are of type “Team”
- “Edit” should open the “Edit Participant”-window, with the data loaded from the selected participant
- “Remove” should remove the selected participant from the tournament
- “Remove” should also delete the Participant if the selected participant is temporary
- The “Edit” and “Remove”-buttons should be disabled, if no participant is selected
- The “+ Participant” and “Fill Random”-buttons should be disabled, if the tournament size is reached.

Participants

Participants of "Super Gaming Cup 2019"

4 Participants	8 Tournament Size
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Name
FlourPandas
SpaceMonkeys
The_BBQ_Taste
UnknownWizards

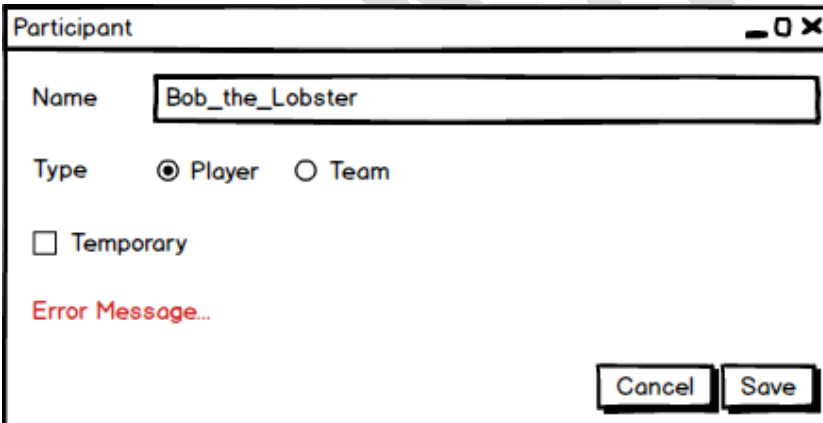
Figure 5: Mockup: Participants Tab

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4.6 Edit Participant

This window is used to edit or create a participant.

- Name
 - Create a textbox to allow the user to enter a name for the participant
 - Validation: The name cannot be empty or whitespace.
- Type
 - Create radio buttons to allow the user to set if the participant is a “Player” or a “Team”
 - Validation: A selection must be made
- Temporary
 - Create a checkbox to allow the user to set whether the participant is temporary.
- Error
 - Create an error-message to alert the user if some input data is invalid.
 - The error-message should have the color red.
- Cancel-button
 - Create a Cancel-button, which closes the window without making any changes to the DB.
- Save-button
 - Create a Save-button.
 - Saving should be interrupted if at least one input field is invalid.
 - Saving should update or create the participant with the given data.
 - After saving, the window should close automatically.



Participant

Name

Type Player Team

Temporary

Error Message...

Cancel Save

Figure 6: Mockup: Edit Participant

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4.7 Matches Tab

The “Matches Tab” is shown in the “Tournament Overview”. Initially, if the tournament has not started yet, it only shows a large button to start the tournament.

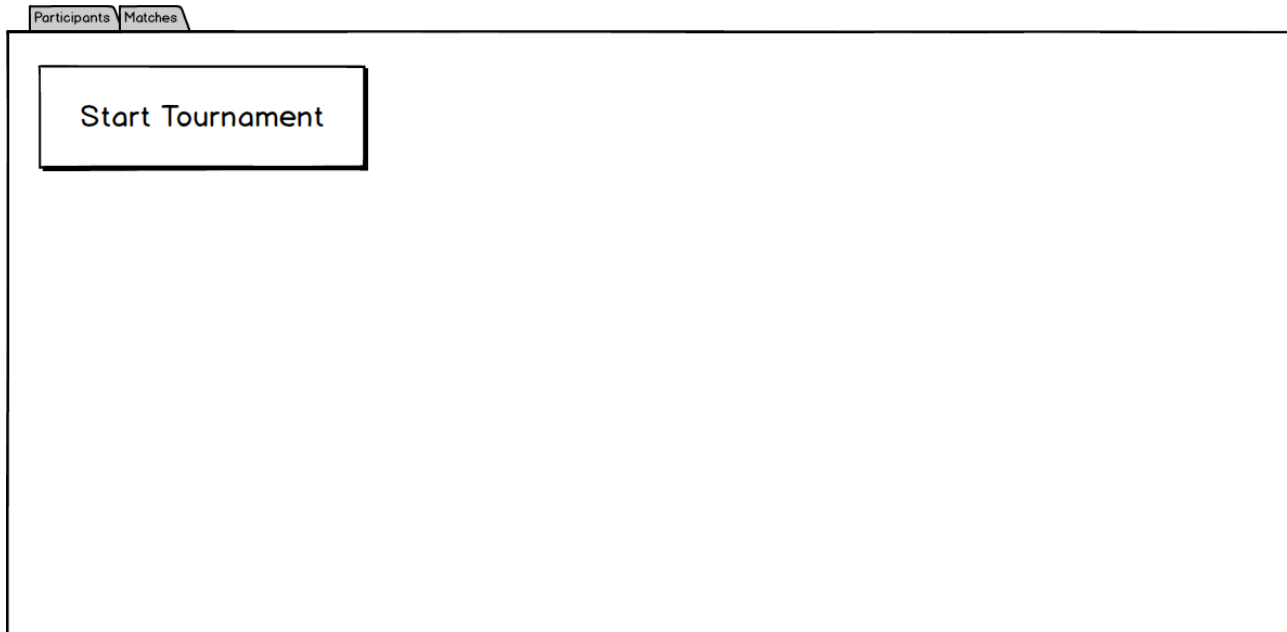


Figure 7: Mockup: Matches Tab: Initial State

Upon clicking the “Start Tournament” button, the TournamentState should change to Started (1) and the first stage of the tournament must be created automatically. The “Start Tournament” button should then be replaced by a tab control to display the stages of the Tournament. The tournament can only be started if the number of participants equals the tournament size. Disable the button or give an appropriate error-message if this is not the case.

If the tournament has started, the matches tab shows all matches divided in stages.

- Create a tab-control with a tab for each stage
- In the top of the tab create a big font text to display the stage (“Stage n” where n is the number of the stage)
- Also, in the top create indicators of how many matches are played in this stage and how many participants are going through this stage
- Each tab contains a list of all matches in this stage

4.7.1 Match Stages

- If a stage gets created, the match-ups are created randomly of all remaining participants.
- If all matches inside a stage are finished, a new stage gets created automatically with all winners from the last stage as participants.
- In the case of an uneven number of remaining participants, not every participant can have an opponent. In this case the lonely participant gets a “free-win”.

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4.7.2 Match User Control

The “Match User Control” allows the user to select a winner and add a comment.

- The Name of the Match is always “Match s.m” where s is the number of the stage and m is the number of the match
- If a match is undecided, buttons with the letters “W” for winner and “L” for loser and should be placed above each participant name.
- Choose appropriate colors for those buttons.
- Pressing a state-button should also set the correct state for the opponent (other participant)
- “free-wins” are displayed the same as the normal decided match, obviously just without a name for the second participant.
- If the winner/loser of the last match is decided, the tournament must be declared as finished and the winner should be set.

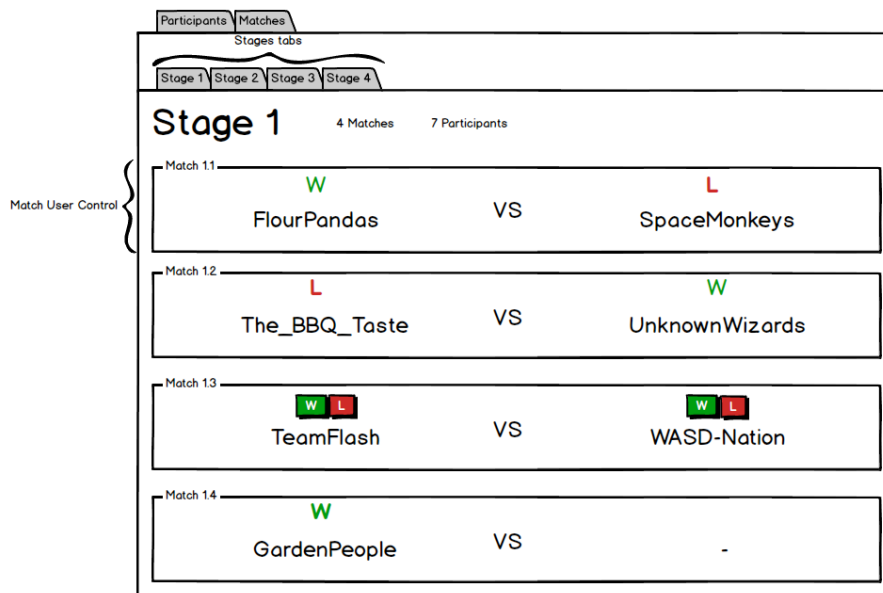


Figure 8: Mockup: Matches Tab: Ongoing Tournament

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4.8 Export Data

The export-file is a comma-separated csv-file. Basically, it is an aggregated spreadsheet from the Match-table. Following table shows which columns must be created and which content is expected.

Column	Content
Stage	The Number of the stage
Order	The Order of the match within the stage
Winner	The Name of the winner participant
Loser	The Name of the loser participant

Table 6: Export Data: Headers and Content

- Only include the matches of the current tournament.
- Order the entries by "Stage" and then "Order"
- If no loser can be determined, use the dash-symbol (-) as its name
- For predefining the filename use following format: {TOURNAMENT}-{DATE}.csv, where {TOURNAMENT} is the name of the tournament and {DATE} is the current date in "YYYYMMDD"-format.
- Use a "File-Save-Dialog" to let the user define a location and change the filename before the file gets created.

Tip:

Since csv is a comma-separated format, values containing commas can mess up the structure. Surround the value with the double-quote-symbol ("). To encode double-quotes, replace the double-quotes with two double-quotes (" → ""). Don't add spaces between comma and values. (value1, value2 → value1,value2)

5 Delivery

Please hand in your deliverables (see chapter 1.4) where the supervising person instructs you.