MapDatabase Editor

User Guide

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1.0 Introduction

The MapDatabase Editor is a Web-based program that was created to assist Mathematics Faculty Computing Facility and Computer Science Computing Facility staff in mapping machine rooms. The program consists of several scripts that generate a series of dynamic Web pages, which serve as an interface for users to manipulate data stored in a database. This data contains details about rooms, objects within the rooms, objects within those objects, and so forth. Depending on their privileges, users are able to view, edit, or create rooms and objects. Because of the nature of its design, this program may also be used to map other kinds of rooms.

2.0 User Accounts

2.1 Getting a user account

To obtain a shared account, the user should ask Chris Roth or Lawrence Folland for a username and password. The user can also ask Lawrence Folland to create a private account. Usernames must be unique and no longer than eight characters.

2.2 Privileges

User accounts are divided into three groups. Each group of accounts is given a different level of privileges: Creator, Editor and Viewer. Accounts with Creator privileges allow users to create maps, create and edit object types, and remove objects that contain other objects. In addition, users with Creator accounts can do everything users with Editor accounts can.

Editor accounts allow users to insert and move objects in rooms, remove empty objects, change what kinds of objects are allowed to be inserted into an object, update info fields and navigate through the maps of the various rooms and objects that have been created. Users with Viewer accounts can only navigate through the maps of rooms and objects that others have created.

2.3 Login

To login, the user should open a web browser and go to the login page at

www.student.cs.uwaterloo.ca/~tang/login.php (See *Figure 1*), type the assigned username

and password in the appropriate text boxes, and then click the login button. The user

should note that cookies must be enabled, and usernames and passwords are case

sensitive. A successful login will take the user to the Menu page (See *Figure 2*).

Figure 1 - Login Page
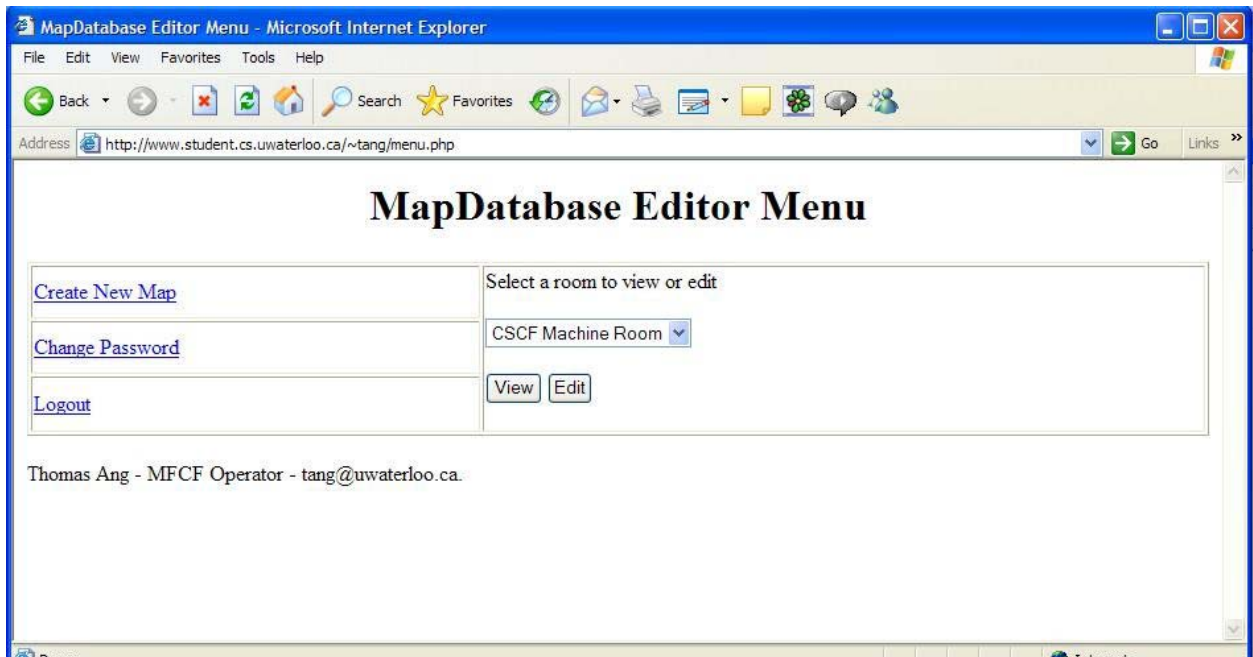
Figure 2 - Menu for User with Creator Privileges

2.4 Changing Passwords

After logging in, the user may change the current password by clicking on the "Change Password" link. The user will be taken to the Password Changer page (See *Figure* 3). However, if the user were sharing the account with other users, it would be best to consult with them before changing the password. The user should type the old password in the first text box, followed by the new password in each of the next two text boxes. Finally, the user should click the Change Password button. Upon a successful change, the page should display "Password change successful" at the top of the form. Passwords cannot be changed to empty strings.

Figure 3 - Password Changer Page

3.0 Using the MapDatabase Editor

3.1 Creating a new map

This feature is only available to users with Creator privileges. When in the Menu page, clicking on the link that reads "Create New Map", will take the user to a page titled "MapDatabase Room Creator" (See *Figure 4*). The first text box is for the name the new room will be given. If the name entered by the user is already in use by another room, or is the empty string, the page will be refreshed with a message asking for a new name.

In the second field, the user must type the building name and/or the floor that the room is on. This will be used later to display the location of the room and objects within it. Once again, if this box is left empty, the page will be redrawn with a message requesting that this box be filled.

In the Internal Grid Dimensions text box, the user specifies the dimensions of the grid(s) that will represent the map of the new room. If the room is composed of a single rectangular grid, the dimensions should be entered into the text box as the width, followed by the letter x, followed by the depth of the room. The program will display width horizontally and depth vertically.
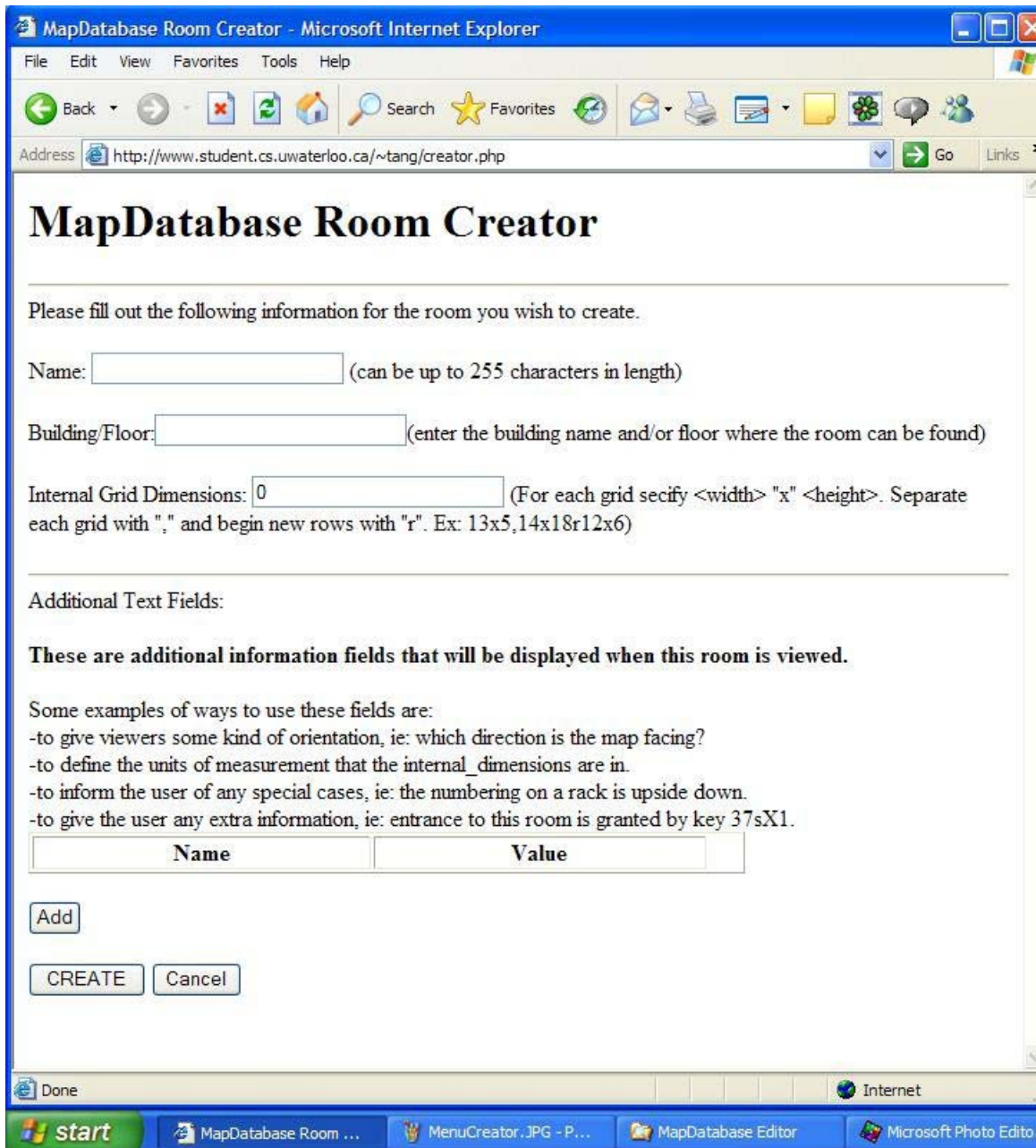
Figure 4 - Room Creator Page

The reason for the allowance of multiple grids for a room is for the case that the units in which the user would like to map the room changes part way through, or if the room is not a rectangle. For example, the machine room in MC 3015 may be mapped by its floor tiles, however, these tiles change size partway through the room. Hence one grid can be

used to represent the part of the room that has large tiles, while a second grid can be used to represent the part of the room that has small tiles. Another example where multiple grids can be used is if the users wish to map an "L" shaped room. In this case the user should use two adjacent rectangles of different sizes to create the L, in other words a narrow grid followed by a wider grid below it.

The user may use "," to create additional grids that are horizontally adjacent, and "r" to create new rows. In other words 10x11,14x12r15x17r10x10,16x16 will produce 5 grids (two grids side by side followed by one grid on the next row followed by two more side by side grids on a third row). In the case of a room that will always remain empty, the dimensions should be left as "0". The user should be very sure of the dimensions that are entered, because this program currently does not facilitate the changing of dimensions for an object that has already been created. Also, the user should check the syntax of the dimensions because if they do not follow the proper format, a logical error in the program will result.

Beneath the second horizontal rule on the page, after the three text boxes just discussed, is a portion of the page devoted to creating additional text fields. Beneath several examples of uses for additional text fields is a table containing just the headings "Name" and "Value". Every time the "Add" button is clicked, a new row in the table is created. The text box under "Name" is the name that will be given to the text box. After the room has been created this will not be changeable. The text box under "Value" is the value that is being assigned for that text field; this can be changed after the room has been created.

Clicking the "Remove" button at the end of the row of an unwanted text field removes that row.

When finished, the user should click on the CREATE button and the room will be created in the database. Then browser will be automatically redirected to a page that will allow the user to select what kind of objects can be inserted into this room: the Allowable Insert Selector page. The Cancel button will redirect the user to the previous page before the MapDatabase Room Creator page.

3.2 Allowable Inserts

An allowable insert is an object type that can be inserted into a room or another object. Examples would be racks and machines: machines may be inserted into racks, and both racks and machines may be inserted into rooms. The Allowable Insert Selector page (See *Figure 5* and *Figure 6*) can be reached from the MapDatabase Room Creator page, the MapDatabase Object Inserter page, and from Edit Mode. Users with Creator privileges can create and edit the properties of object types, while users with Editor privileges can only choose which object types are allowed to be inserted into each object.

When viewing the Allowable Insert Selector page, the sentence under the first horizontal rule on the page tells the user which object is currently being edited. Both kinds of users will see two drop-down selection boxes. The one on the left contains all the types of objects that are already allowed to be inserted into the current object. The drop-down

selection box on the right contains all defined object types excluding ones that are already allowed to be inserted into the current object.

The ←Insert button transfers the object selected from the right drop-down selection box to the left drop-down selection box. The Remove→ button transfers the object selected in the left drop-down selection box to the right drop-down selection box. If the user has Creator privileges, directly below these two buttons will be a third button labeled "Edit". Clicking this button will enable the user to edit the object selected in the right drop-down selection box unless this box is empty, in which case the user will be allowed to edit the object selected in the left drop-down selection box. If the user has Editor privileges, then in place of the Edit button, will be a button labeled "View". This button functions exactly like the Edit button except this button only allows the user to view the properties of the object.

Under the second horizontal rule of the page is a form that differs depending on the user's privileges and actions. If the user has Editor privileges and is not viewing an object, then only the DONE button will be displayed beneath the second horizontal rule. If the user has Creator privileges and is not currently editing an object type, then the user will see a blank form followed by an Add button and a DONE button, as is shown in *Figure 5*. If this is the case, the user can fill out the form and click Add to create a new object type that will appear in the right drop-down selection box. The form consists of a Name text box, and Additional Text Fields text box, and a Link to Inventory checkbox. The Name text box is where the user specifies the name of the new object type that is to be created;

the user will not be allowed to proceed if this is left empty. The Additional Text Fields

box is where the user specifies any additional text fields that should be displayed

whenever an object of this type is viewed or edited. These are much like the additional

text fields that are available when creating a new room, except the ones specified here do

not have a starting value since these are not for specific objects. When defining what text

fields are available for an object type, the user simply lists the names of the text fields

that are desired separated by spaces in the Additional text Fields box. The Link to

Inventory checkbox should be checked off for any type of object that would have

inventory barcodes. If the user clicks the DONE button, the database will be updated and

the user will be taken to the map page for the current object unless the current object is a

room, in which case the user will be taken to the Menu page.

If the user is editing an object type, then the form will be the same as the one that is used

to add new object types except the Name text box will be disabled and the buttons at the

bottom will be Update, Remove and Cancel. This is shown in *Figure* 6. Clicking the

Update button will save any changes made to the object type in the database, and then

return the user to the screen where new object types can be created. Clicking the Remove

button will delete the selected object type from the database. This action may not be

performed when an object of the selected type still exists somewhere in the database. For

example, if there is a Rack in one of the rooms in the database, then the Rack type cannot

be deleted. After a successful Update or Remove, or after clicking the Cancel button, the

user will be returned to the previous screen.

If the user is viewing an object type, then the form will be the same as the one that is used to edit object types except all fields will be disabled, and the Update and Remove buttons will not be displayed.

Figure 5 - Allowable Insert Selector Page when Adding

Figure 6 - Allowable Insert Selector Page when Editing

3.3 View Mode

View Mode, shown in *Figure 7*, allows users to view map pages for the objects stored in the database. This is available to users of all privileges. View Mode can be entered two ways: from the Menu page or from Edit Mode. From the Menu, the user should select the desired room from the drop-down selection box and then click the View button below. Alternatively, the user may click the View button while in Edit Mode. In either case the

user is taken to a map page for the appropriate object. At the very top of the page in a

large font is the name of the object. On the left side is a panel of buttons and links.
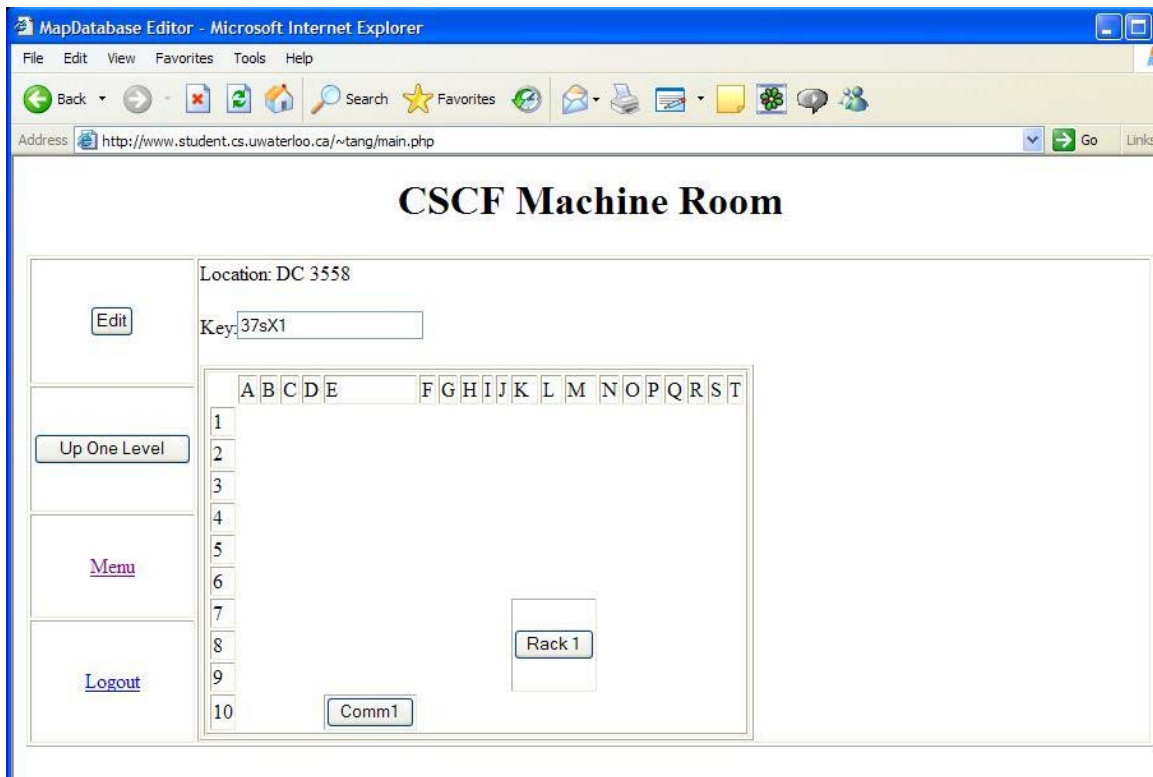
Figure 7 - View Mode

If the user has Editor or Creator privileges, the first button from the top is the Edit button;

clicking this will take the user into Edit Mode. The next button is the Up One Level

button, which takes the user to the map page of the object that contains the current object

or the Menu page if the current object is a room. For example, if the user is viewing a

Rack that is inside a room, then clicking Up One Level will take the user to view the

room and clicking Up One Level one more time will take the user to the Menu. Below

that button is a hyperlink that takes the user to the Menu page, and below that, a

hyperlink that logs out the user.

To the right of this panel is where the information about the current object is displayed. At the top is the location of the current object and directly below are any additional text fields that may have been defined for the current object (these were defined when creating room or defining an object type). The rest of the page is where all the grids for the map of the current object are displayed. If the current object has internal dimensions of zero, then this area will be empty. Across the top the columns are lettered and on the left side the rows are numbered. The numbering and lettering of rows and columns continue from one grid to the next. In the grid map, any objects that exist within the current object will be displayed as buttons with the names of the objects. Clicking on one of the buttons will take the user to the map page for that object.

3.4 Edit mode

Edit Mode, shown in *Figure 8*, is similar to View Mode except that it gives users the ability to change the map pages for the objects stored in the database. This is available to users with Creator and Editor privileges. Edit Mode can be entered two ways: from the Menu page or from View Mode. From the Menu, the user should select the desired room from the drop-down selection box and then click the Edit button below. Alternatively, the user may click the Edit button while in View Mode. In either case the user is taken to a map page for the appropriate object. At the very top of the page in a large font is the name of the object. On the left side is a panel of buttons and links.
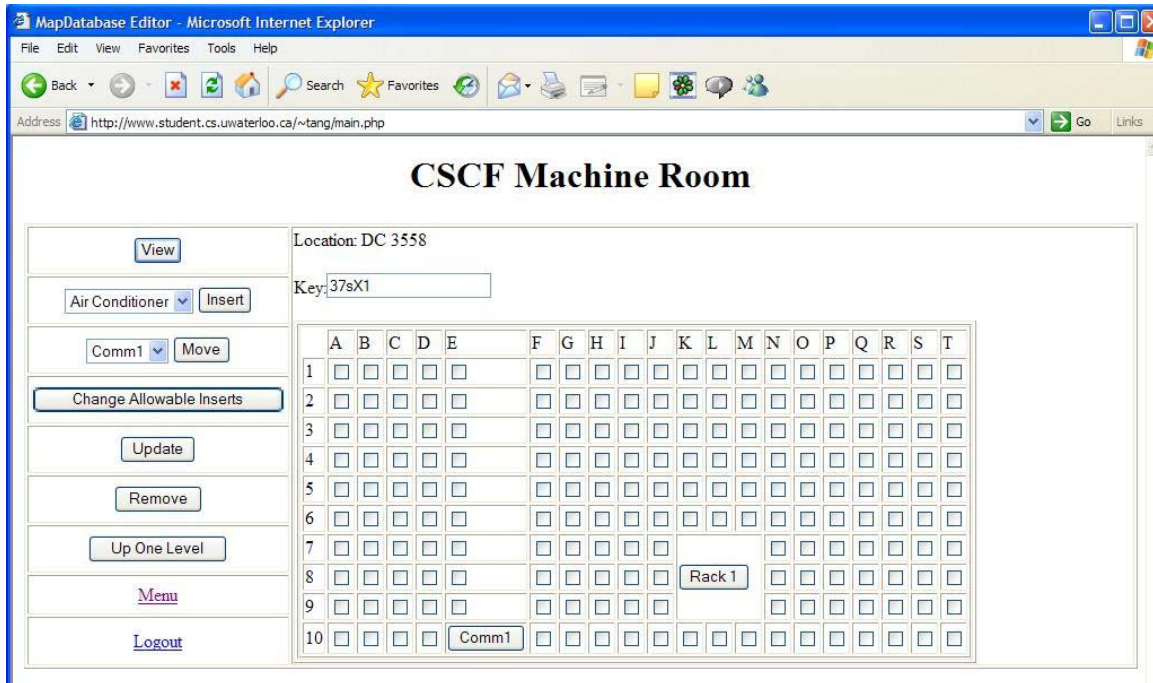
Figure 8 - Edit Mode

The first button from the top is the View button; clicking this will take the user into View Mode. The next three rows in the panel are only available if the current object does not have the internal dimensions of zero. In the first of the three rows are a drop-down selection box and a button labeled "Insert"; these are used to insert objects. To insert an object that will occupy one cell in the map grid, the user must check off the box for the location where the object will reside. If the object will occupy more than one cell, then the user must check two boxes that are in the cells that would make the top left and bottom right corners of the rectangle where the object will reside. The user must then select the object type from the drop-down selection box and click Insert. If the insert is successful, the user will be taken to the Object Inserter page, otherwise, an error message will be displayed near the top of the page. Note that all objects must be rectangular.

In the next row is another drop-down selection box and a button labeled "Move". To move an object, the user selects the new location by checking off boxes the same way that one would when inserting a new object. Then the user selects the name of the object from the drop-down selection box and clicks the Move button. If the move is successful then the page will be redrawn with the object in its new location, otherwise an error message will be displayed near the top of the page. Note that all rules about checking boxes for selecting location that apply to inserting also apply to moving: for a rectangle of size greater than one, the user must select the top left corner and bottom right corner of the desired rectangle.

In the final of the three optional rows is the Change Allowable Inserts button. Clicking this button will take the user to the Allowable Insert Selector page. For more information see section, *3.2 Allowable Inserts*.

The next button is the Update button. When this button is clicked, any changes to the contents of the text boxes above the grid map will be saved to the database. Next is the Remove button. Clicking this button will delete the current object from the database. However, only users with Creator privileges may delete objects that contain other objects. The following button is the Up One Level button, which takes users to the map page of the object that contains the current object or the Menu page if the current object is a room. For example, if the user is editing a Rack that is inside a room, then clicking Up One Level will take the user to edit the room and clicking Up One Level one more time

will take the user to the Menu. Below that button is a hyperlink that takes the user to the Menu page, and below that, a hyperlink that logs out the user.

To the right of this panel is where the information about the current object is displayed. At the top is the location of the current object, and directly below are any additional text fields that may have been defined for the current object (these were defined when creating room or defining an object type). The rest of the page is where all the grids for the map of the current object are displayed. If the current object has internal dimensions of zero, then this area will be empty. The columns are lettered across the top, and the rows are numbered on the left side. The numbering and lettering of rows and columns continue from one grid to the next. In the grid map, any objects that exist within the current object will be displayed as buttons with the names of the objects. Clicking on one of the buttons will take the user to the map page for that object. The vacant spaces are marked with check boxes, which are used to select locations for inserting and moving objects.

3.5 Object Inserter Page

To insert objects, a user must have Creator or Editor privileges. The user is redirected to this page, shown in *Figure 9*, once they have selected the location and object type properly, and clicked the Insert button in Edit Mode (See section *3.4 Edit Mode*).
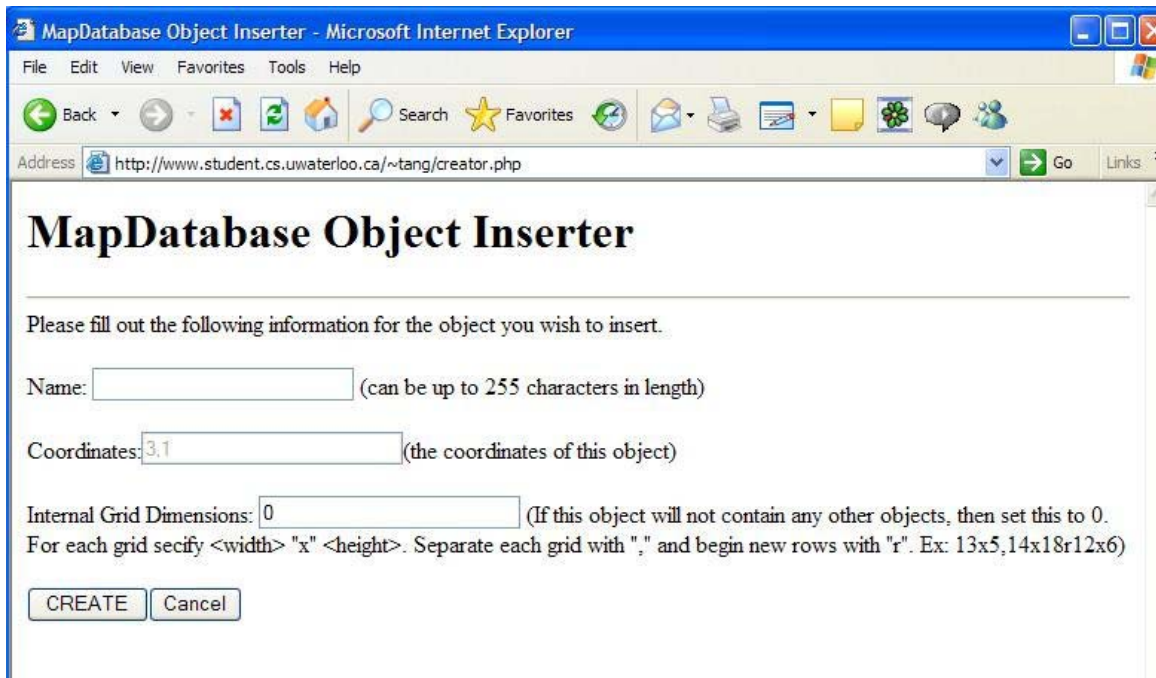
Figure 9 - Object Inserter Page

In the first text box, the user should type the name that is to be given to the new object. If another object in the same object already has this name, or the name is an empty string, the user will be asked for a new name. In the second field, the coordinates of the location that the new object will be inserted into are displayed. These coordinates are obtained from the check boxes that were checked off in Edit Mode. In the Internal Grid Dimensions text box, the user specifies the dimensions of the grid(s) that will represent the map of this object. This is done exactly the same way that specifying the dimensions for a new room is done (See section *3.1 Creating a New Map)*.

Below the Internal Grid Dimensions field will be any additional text fields that may have been defined for the chosen object type. Users should fill out the appropriate information to the best of their knowledge, but the values can be altered later on. When finished, the

user should click on the CREATE button and the object will be created in the database. The user will be automatically redirected to the Allowable Insert Selector page unless the Internal Grid Dimensions were "0", in which case the user will be redirected to the map page for the new object. The Cancel button will redirect the user to the previous page.

4.0 The Future of the Program

At this time, though this program is functional, it is not final. Many changes may be applied such as the removal of various bugs and the implementation of new functionality.

4.1 Known Bugs

Since not all bugs can be removed immediately, there are some bugs that users should know about in the meantime:

- The user should avoid using the back button where possible because the back button does not update cookie data when redrawing pages. This can result in pages being drawn incorrectly, and can eventually lead to incorrect data in the database.

- When creating new maps or inserting new objects, the syntax of user input for the "Internal Grid Dimensions" text box is not checked for correctness. Therefore if a user specifies the dimensions in the wrong format the program will not know how to interpret the value for the dimensions stored in the database, and result in incorrect drawings of objects or even database query errors.

- Users should also be aware that it is possible for an object to be inserted over top of another while editing a map, thus making it possible for some objects to become hidden behind other objects.

4.2 Planned Upgrades

On top of the removal of bugs, some new functions may be added to the program:

- The addition of an alternative "Index" mode would allow users to see a text overview of the multiple layers of objects in a room. For example, an index of a room would contain a list of all objects in a room and all objects in those objects.

- The program could also be given the function to allow objects to be moved between containers. In other words a machine in one rack could be moved to another rack, or a rack in one room could be moved to another room.

- Other features could be added such as: different links to inventory information, a search function that would allow users to quickly locate a specific object, accommodation for non-rectangular objects, and the facilities for changing the internal dimensions and names of existing objects.

4.3 Contact Information

For any questions or concerns contact Thomas Ang at tang@uwaterloo.ca.