

BaKaPlan

User's Manual Guide



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1 Something about BaKaPlan

BaKaPlan is an web as well as desktop (for Linux Machines) application program or software which helps in generating seating plans especially for examinations. It is an application which reduces the human effort of creating an effective seating plan and generates seating plans automatically.

Looking into its vast usage scope, BaKaPlan is developed in a way which is extremely easy to understand and use which will be explained at later stages of this manual.

From the examination point of view, taking into consideration the seating capacity of an institution and to avoid any chances of cheating and copying, BaKaPlan provides five seating strategy options namely Cushy, Flip Flop, Triplet, Quadlet and Serpentine. Each strategy has its own importance.

Major developing tools used in BaKaPlan are C++ and CGI (Common Gateway Interface). MySQL is used to handle databases where all the details required and filled are stored.

2 Requirements

2.1 List of requirements

- GNU G++ Compiler
- Apache2 server
- CGICC Library
- MySQL Connector for C++
- Boost Library
- jwSMTP Library
- LIBHARU PDF Library
- EXIM4 Mail Server

3 Installation

NOTE :

- If you are installing the software through script, there is no need to take care of the requirements. The script itself checks and installs all the essential requirements and makes the software work.

3.1 Manual Installation

3.1.1 Installation of requirements

- GNU G++ Compiler
\$ sudo apt-get install g++
- Apache2 Server
\$ sudo apt-get install apache2
- CGICC Library
Run following command in terminal:

```
$ sudo apt-get install libcgicc5-dev
```

OR

Download any latest package from [here](#)
Then run following commands in terminal:

```
$ tar xzf cgicc-X.X.X.tar.gz
$ cd cgicc-X.X.X/
$ ./configure - -prefix=/usr
$ make
$ sudo make install
```

- MySQL and MySQL Connector for C++
Run following commands in terminal:

\$ sudo apt-get install mysql-server mysql-client
\$ sudo apt-get install libmysql++
\$ sudo apt-get install libmysql++-dev
- BOOST Library
\$ sudo apt-get install libboost1.49-dev

- jwSMTP Library

Download jwSMTP Library from [here](#)

Run following commands in terminal:

```
$ cd ~/Downloads
$ tar -xzf jwsmtp-X.X.X.tar.gz
$ cd jwsmtp-X.X.X
$ ./configure
$ make
$ sudo make install
```

NOTE: If you got error in */mailer.cpp or */demo2.cpp file while compiling then include string header file in that. And again run make.

- LIBHARU PDF Library

Download LIBHARU PDF Library from [here](#)

Run following commands in terminal:

```
$ cd ~/Downloads
$ tar -xzf libharu-libharu-RELEASE_2_3_0RC2-61-g22e741e.tar.gz
$ cd libharu-libharu-22e741e
$ cmake -G 'Unix Makefiles'
$ make
$ sudo make install
```

NOTE: If you get any error regarding cmake, then run

```
$ sudo apt-get install cmake
$ cmake -G 'Unix Makefiles'
$ make
$ sudo make install
```

- EXIM4 Mail Server

Run the following commands in terminal:

```
$ sudo apt-get install exim4
$ sudo dpkg-reconfigure exim4-config
```

A Mail Server Configuration window will appear.

Follow the following instructions to configure the mail server.

- 1) The first page is just an introduction. Press ENTER.
- 2) On the second page choose the second option i.e mail sent by smarthost; received via SMTP or fetchmail and press ENTER.
- 3) Next Keep the system mail name as it is and press ENTER.

- 4) Just Press Enter for the next page.
- 5) The next page asks you to enter IP addresses to listen on incoming SMTP connections. Leave it as it is and Press ENTER.
- 6) Even on the next page let the value be the default one and Press ENTER.
- 7) Leave the next page as it is and Press ENTER.
- 8) The next page asks you for IP address or host name of the outgoing smarthost. Enter smtp.example.com::587. Where example refers to gmail, yahoo or any other mail service provider and 587 is port number.
- 9) The Next page asks you if you want to hide local mail name in outgoing mail? Choose No.
- 10) The Next asks you if you want to keep number of DNS-queries minimal? Choose No.
- 11) On the next page choose the delivery method for local mail as mbox format in /var/mail/.
- 12) Next page asks you if you want to split configuration into small files? Choose No.
- 13) Next keep root and postmaster mail recipient empty.

Now terminal will show that MTA is being restarted.
After this is done, run the following command in terminal.
\$ sudo vim /etc/exim4/passwd.client

Add following in the file
:USERNAME@example.com:PASSWORD
Where, USERNAME is a valid email address and PASSWORD is password for USERNAME.

3.1.2 Installation steps for using BaKaPlan.

- Configuring public_html/cgi-bin folder for executing files on browser.

****Steps to configure public_html****
Run following command in terminal:
\$ mkdir ~/public_html
\$ sudo a2enmod userdir
\$ sudo service apache2 restart

Giving 755 permissions to public_html directory
\$ chmod -R 755 ~/public_html

Now open http://localhost/~username in browser.
Here username is your login name.

****Steps to configure cgi-bin in public_html****
\$ sudo a2enmod cgi
\$ sudo a2enmod cgid
\$ sudo service apache2 restart
\$ cd ~/public_html

```
$ mkdir cgi-bin
$ cd /etc/apache2
$ sudo vim sites-available/default
```

Add following text in file:

```
ScriptAlias /cgi-bin/ /home/*/public_html/cgi-bin/
<Directory "/home/*/public_html/cgi-bin">
AllowOverride None
Options +ExecCGI -MultiViews +SymLinksIfOwnerMatch
SetHandler cgi-script
Order allow,deny
Allow from all
</Directory>
```

Save it and then restart apache

```
$ sudo service apache2 restart
```

- Open terminal and run following commands

```
$ cd public_html/cgi-bin
$ git clone https://github.com/GreatDevelopers/bakaplan.git
$ cd bakaplan
```
- Editing database details

```
Open ~/public_html/cgi-bin/bakaplan/frontend/src/header/database-detail.h
Add your details and save file
Now cd to ~/public_html/cgi-bin/bakaplan and run
$ make install
```
- Importing ~/public_html/cgi-bin/bakaplan/database/*.sql file in your database

```
Do as following in terminal:
$ mysql -u username -p
$ create database database_name;
$ quit
```

Now cd to place where .sql file exists

```
$ ~/public_html/cgi-bin/bakaplan/database
$ mysql -p -u root database_name i bakaplan.sql
```
- Accessing BaKaPlan

After all above steps open browser and open following link:
<http://localhost/~username/cgi-bin/bp/login>

Here username is your login username

If this link does not work and you get an Internal Server Error, do as following to remove that:

```
$ sudo ln -s /usr/local/lib/libjwsmtplib-<version>.so /usr/lib/libjwsmtplib-<version>.so
```

Replace `<version>` with your installed one or use tab.

NOTE: Be sure that you must have write permission in the directory (`~/public_html/cgi-bin/bakaplan/` and `~/public_html/`) where outputfile is to be generated.

3.2 Installation using Script

- Go to the following link to download a folder named Script.

Run the following commands to install BaKaPlan:

```
$ cd ~/Downloads/script/script.sh
```

```
$ bash script.sh
```

4 Using BaKaPlan

BaKaPlan is developed in a way which is extremely easy to understand and use as explained in this section.

4.1 Registration

The last step of the installation (either manual or through script) will lead you to the first page i.e Login. You will have to login everytime you want to use BaKaPlan.

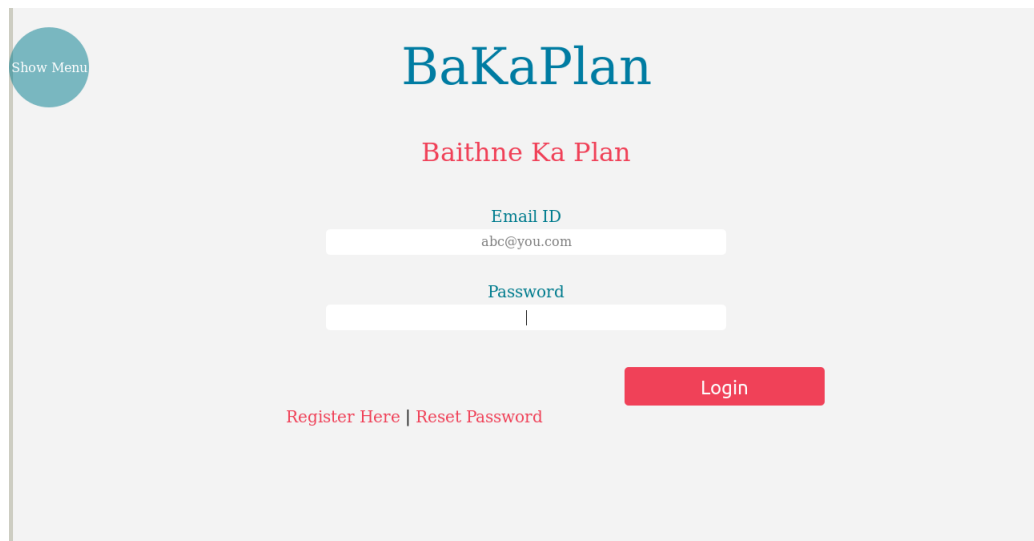
The image shows the login page of BaKaPlan. At the top left, there is a teal circular button labeled "Show Menu". The main heading "BaKaPlan" is in a large blue font, with the subtitle "Baithne Ka Plan" in a smaller red font below it. The login form consists of two input fields: "Email ID" with the placeholder text "abc@you.com" and "Password" with a single character placeholder "|". Below the password field is a red "Login" button. At the bottom left of the form area, there are two links: "Register Here" and "Reset Password".

Figure 1: Login Page

As a first time user, you will have to register first. Clicking on 'Register Here', will direct you the page as shown in Figure 2.

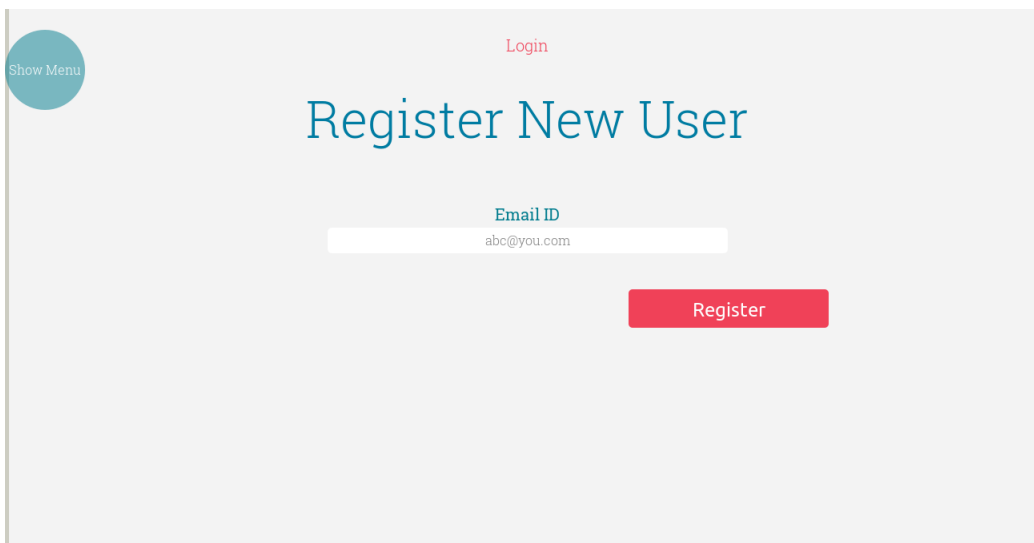
The image shows the registration page of BaKaPlan. At the top left, there is a teal circular button labeled "Show Menu". The heading "Register New User" is in a large blue font. Above this heading, the word "Login" is written in red. The registration form has a single input field for "Email ID" with the placeholder text "abc@you.com". Below the input field is a red "Register" button.

Figure 2: Register New User

Here, enter your email id and click on ‘Register’.

This will display a new page with the message ‘Check verification mail in your inbox (It might land in Junk/Spam folder and sometimes it may not be immediate).’

Now check your mail inbox and click on the hyperlink in the mail content which will direct you to Figure 3 where you will be asked to set password for your account.

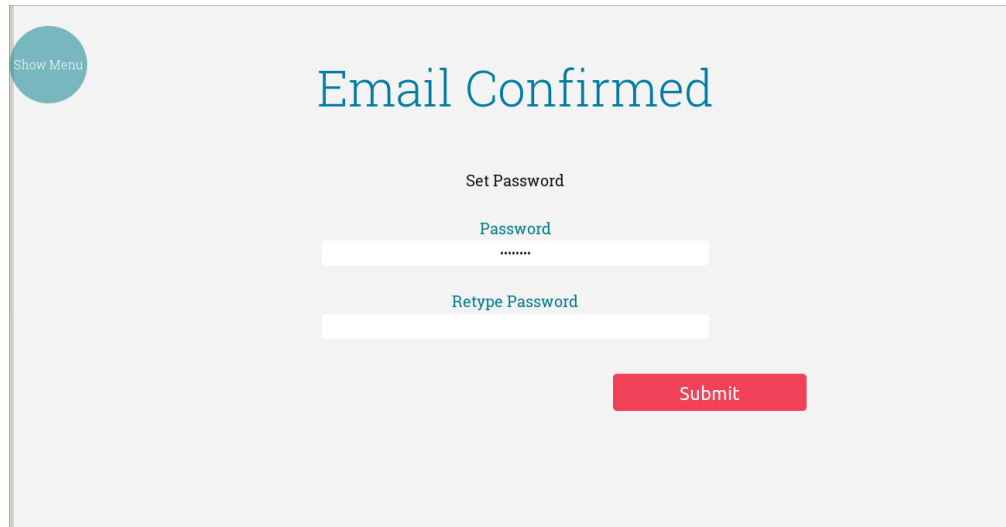
The screenshot shows a web interface with a light gray background. In the top-left corner, there is a teal circular button labeled 'Show Menu'. The main heading is 'Email Confirmed' in a large, teal, sans-serif font. Below the heading, the text 'Set Password' is centered. There are two input fields: the first is labeled 'Password' in teal and contains a series of dots; the second is labeled 'Retype Password' in teal. A red rectangular button labeled 'Submit' is positioned to the right of the second input field.

Figure 3: Set Password

Once you have set your password, you will be again directed to Login Page. To get started enter your email id and password which you have just set.

4.2 Project Detail

The next page (as shown in the figure below) asks for the name of the seating plan project you want to make.

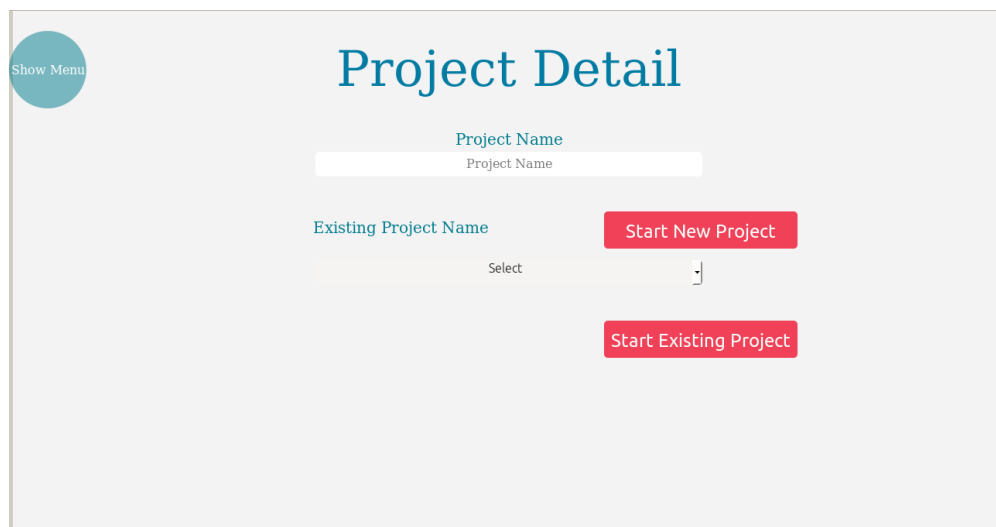
The screenshot shows a web interface with a light gray background. In the top-left corner, there is a teal circular button labeled 'Show Menu'. The main heading is 'Project Detail' in a large, teal, sans-serif font. Below the heading, there is a text input field labeled 'Project Name' in teal, with the placeholder text 'Project Name' inside. Below this, there is a label 'Existing Project Name' in teal, followed by a dropdown menu with the word 'Select' and a small arrow icon. To the right of the dropdown, there are two red rectangular buttons: 'Start New Project' and 'Start Existing Project'.

Figure 4: Project Detail

Enter the name of your project and click on ‘Start New Project’.

4.3 Branch Detail

Branch/Trade Detail

Add Row

Class Name	Subject Name	Subject Code	Delete Row
Info.Tech	DBMS, SAD	IT-101, IT 102	Delete Row

NEXT

Figure 5: Branch Detail

This page asks for the information about the **Class Name** i.e. the name of the class whose exam is to be conducted, **Subject Name** related to the exam to be conducted and the corresponding **Subject Code**.

NOTE: For a single class, you can add names of more than one subject and their corresponding subject codes seperated by a comma.

The **Add Row** button allows you to add the information of another class. This feature allows you to make seating plan for a number of classes. Similar to this is a **Delete Row** button in front of each row which will remove that row.

4.4 Roll No. Detail

The next page (Figure 6) is for providing the Roll Numbers for which the examination is to be conducted. The various fields to be provided on this page are :

- **Prefix:** This is the prefix value of the roll numbers specific to a class or branch.
- **Start Roll no. & End Roll. No**
- **Not Included:** These are the Roll Numbers of the students who are not eligible for the examination. One can either give single values seperated by comma or and range of values(for eg. 29-34).

Figure 6: Roll No. Detail

4.5 DATESHEET

Figure 7: DATESHEET

The **DATESHEET** page (Figure 7) as the name suggests is for providing information about the dates on which the different examinations are to be held.

The page asks for the **Date** of the exam and the corresponding **Exam Code** which is **same** as the **Subject Code**.

The Add Row button can be used for setting exams on more than one date.

At the end of the page is 'Same room and exam details for each day'. Choosing 'Yes' will set the same exam detail for each date and vice versa.

4.6 Room Detail

In the **Room Detail** page we have to provide information about the classes where the students appearing for the exam are to be seated.

The page asks for the following two fields:

- **Centre Name:** Means the name of a block in the institute constituting of a number of classes.
- **Room No.:** Means the name of the rooms being allocated for the examination in that centre. More than one rooms can be given in this space separated by a comma. You need to provide the Room info in the following manner - Room No.:No. of Rows x No. of columns. NOTE: The symbol used in the above sentence is small 'x'.

Room Detail

Add Row

Centre Name	Room No : Rows x Columns	Delete Row
c2	g14:6x6,g15:5x6,g12:7x7,r5:10	Delete Row

NEXT

Figure 8: Room Detail

4.7 Exam Detail

In the above given page, you need to fill the following fields:

- **Name:** This is the name of the examination being carried out for eg. sessionals or semester.
- **Session:** This is the session in which the examination would be carried out i.e. Morning or Evening.
- **Stat Time and End Time:** You can choose these timings from the drop down lists.
- **Venue:** For eg. Name of the College or University.

Figure 9:

4.8 Strategies

BaKaPlan has five different strategies. Each strategy has its own requirements, advantages and disadvantages. One should choose strategy according to the needs and requirements.

List of strategies are as follows:

- Cushy
- Serpentine
- Flip-Flop
- Triplet
- Quadlet

4.8.1 Cushy

Cushy means easy. This is the simplest strategy. In this strategy, seating plan is done continuously. For example, seating plan is done by allocating all roll nos. of first subject code then continuous with 2nd subject code and so on.

Requirement

- Minimum 1 Class/Branch with minimum 1 subject code.

When to use

- When there is only one subject code.
- If examination has multiple sets of subjects.
- If seats in examination has more space between them.

- When there are equal seats with total students means there are no more extra rooms/seats.
- When only there is only one class for seating plan.

When not to use

- When there is any entrance examination.
- When there is no sets/codes for subjects.

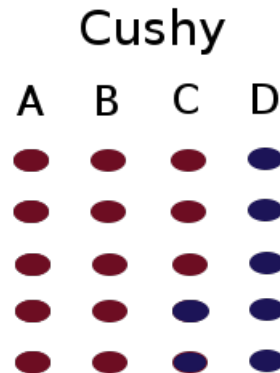


Figure 10: Cushy

4.8.2 Serpentine

Serpentine is the simplest strategy. In this strategy, seating plan is done continuously. For example, seating plan is done by allocating all roll nos. of first subject code then continuous with 2nd subject code and so on.

Requirement

- Minimum 1 Class/Branch with minimum 1 subject code.

When to use

- When there is only one subject code.
- If examination has multiple sets of subjects.
- If seats in examination has more space between them.
- When there are equal seats with total students means there are no more extra rooms/seats.
- When only there is only one class for seating plan.

When not to use

- When there is any entrance examination.
- When there is no sets/codes for subjects.

Serpentine

A	B	C	D
1	10	11	8
2	9	12	7
3	8	1	6
4	7	2	5
5	6	3	4

Figure 11: Serpentine

4.8.3 Flip Flop

Flip Flop is the second strategy. In this strategy, seating plan is done by mixing two subject codes i.e. 1st subject code, 2nd subject code, 1st subject code and so on.

Requirement

- Minimum 2 classes or 1 class with 2 subject codes.

When to use

- When there are minimum 2 subject codes.
- When there is only one set for each subject in examination.

Flip Flop

A	B	C	D
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●

Figure 12: Flip Flop

4.8.4 Triplet

Triplet means combination of three subject codes. There is no seating plan with continuous subject code.

Requirement

- Minimum 3 classes with 1 subject each or minimum 3 subject codes.
- Must have extra rooms if required.

When to use

- When there are not sets or different codes for same subject code.
- When there are minimum three classes.
- When extra rooms are available.

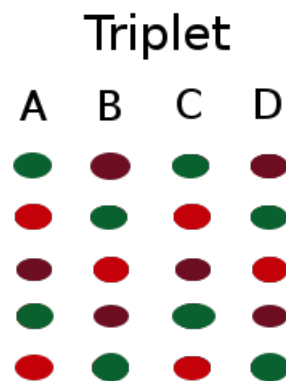


Figure 13: Triplet

4.8.5 Quadlet

Quadlet means combination of four subject codes. It is used when there is no seating plan with continuous subject code.

Requirement

- Minimum four classes with 1 subject each or minimum 3 subject codes.
- Must have extra rooms if required.

When to use

- When there are not sets or different codes for same subject code.
- When there are minimum four classes.

- When extra rooms are available.
- For entrance test.
- When their is less distance between rows and columns.

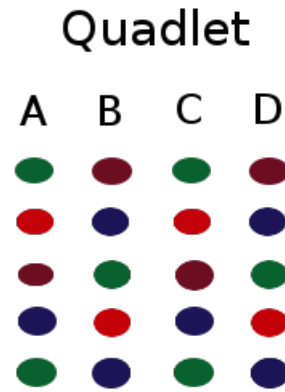


Figure 14: Quadlet

4.9 Valid Strategy Detail

This page gives the final details of the information given by the user and tells if the given number of rooms are sufficient according to the number of students to be seated.

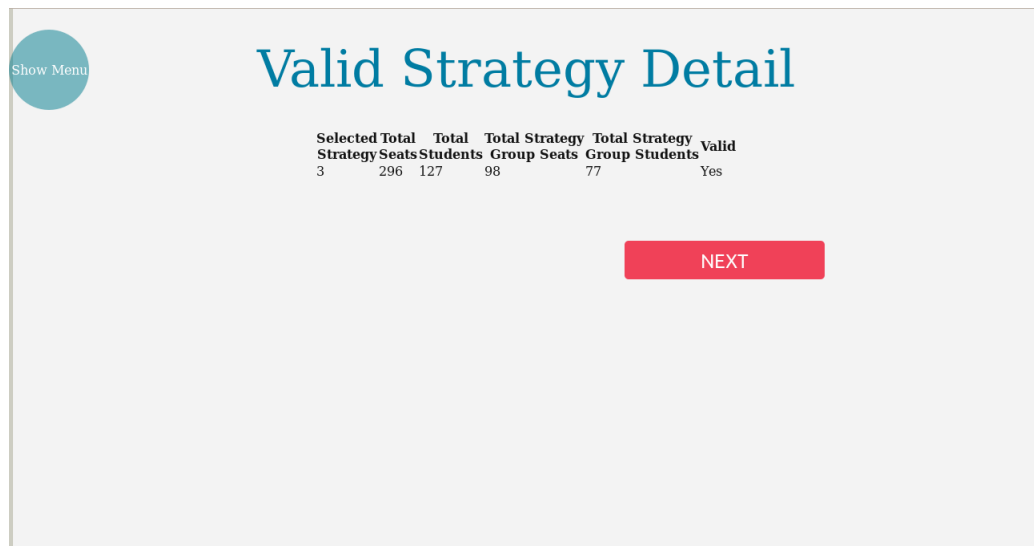


Figure 15: Valid Strategy Detail

4.10 Seating Plan

This is the final page. The user is provided with 2 types of views - **HTML** and **PDF** views.

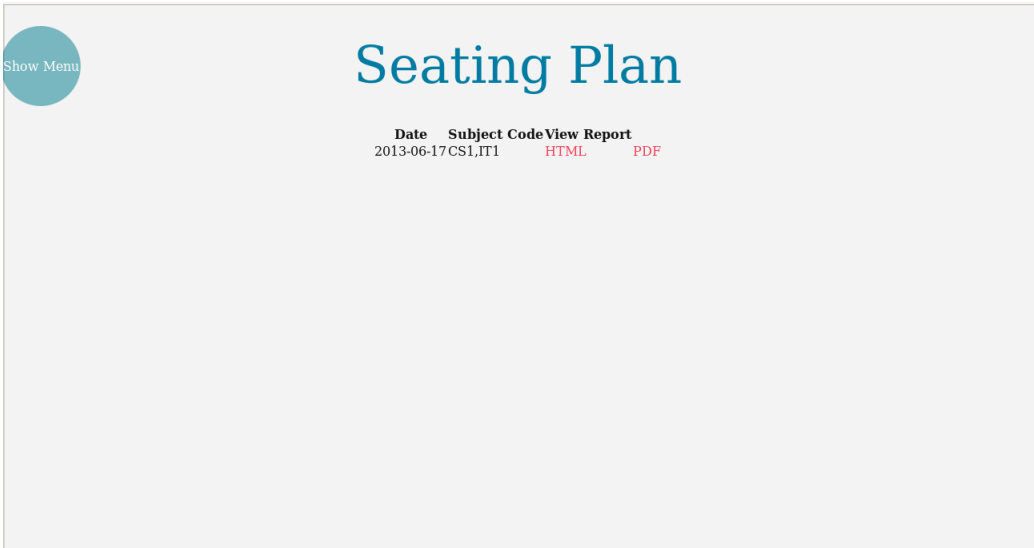


Figure 16: Seating Plan