

# CS315

## DATABASE MANAGEMENT SYSTEM PROJECT



TOPIC: Blood Bank Management  
System-RAKTARPAN

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## Description

Our app is a central blood bank database management system. The app allows blood banks from various parts of the country to register themselves and be part of a centralized blood database. Once a blood bank registers itself, any user visiting the web app may view the available blood units of different blood groups and blood components (red blood cells, plasma, platelets, granulocytes, cryo-precipitated AHF) of that blood bank. The blood bank can update the available units using the app interface. The app also supports adding blood camp events by individual blood camps. These events can then be viewed by any visiting user of the webpage. The app display would show various camp details like start and end dates, start and end time for each day, location and organizer.

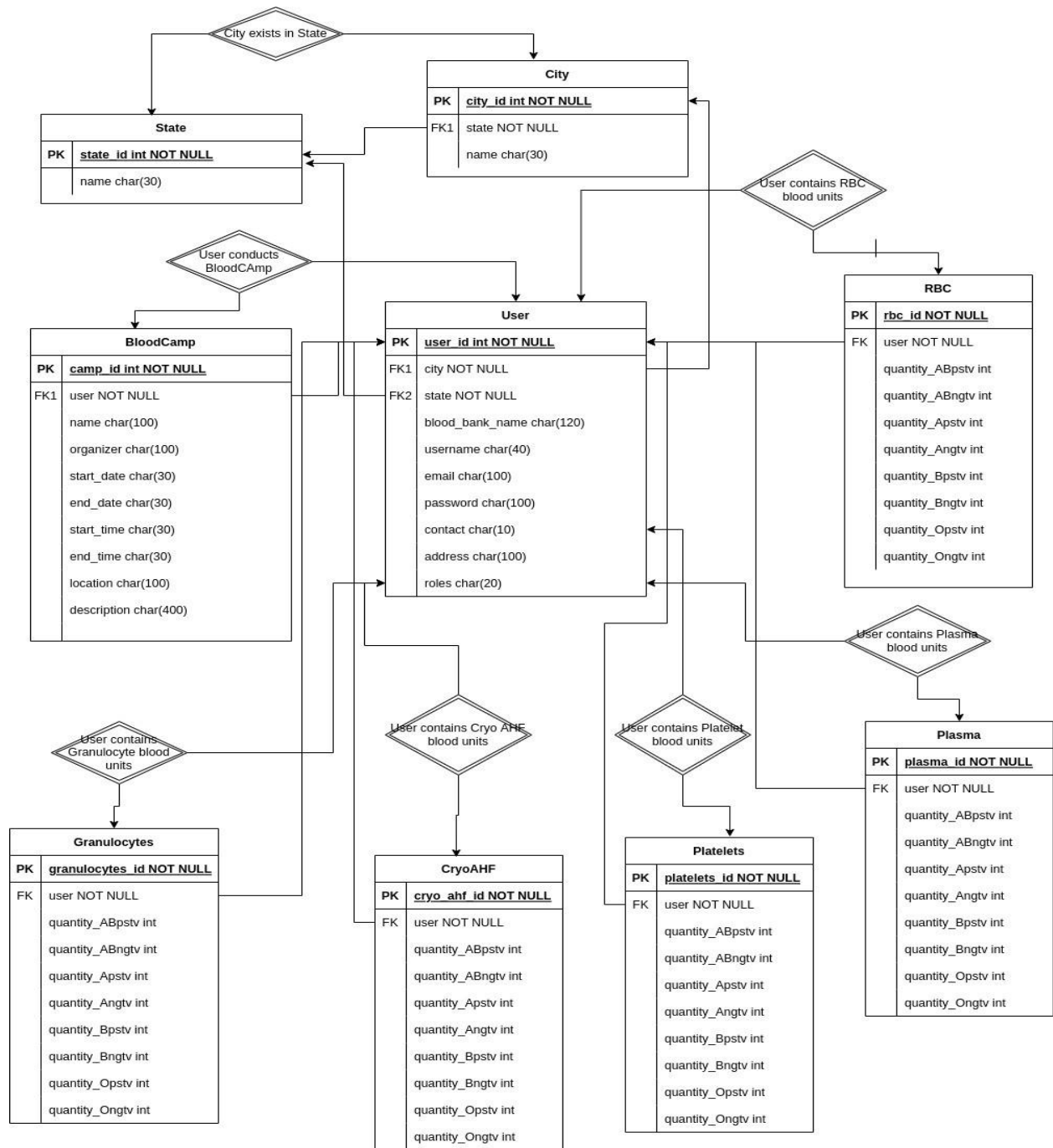
## Purpose

The purpose of our app is to provide a centralized blood database online. By doing this, anyone who is need of a particular blood component of a blood group can look up if there are available blood units in any of the blood banks nearby her/his area. Additionally, a person who is willing to donate blood can look up in the app if there are any blood camp events happening around his/her neighborhood or in fact directly go to a nearby blood bank to donate blood. Our aim was also to provide the blood banks with a common interact to interact with potential donors and consumers. The app also provides them with a very trivial way to update their blood data.

## Vision

Our vision for this app is to further extend the interface to include more functionalities and make it a one-stop solution for blood donors, blood banks and consumers. One more functionality we would like to add in the future is an interface to book/request blood units from a blood bank. That way the concerned individuals can be sure of getting the required blood units when they reach the blood bank. The request feature would have an expiry period of about a week. Further, there could be feature for registering for delivery of blood units to various locations. The user would have to first request blood units. On acceptance, the user could choose to deliver the blood units to his home.

## ER DIAGRAM:



## DEVELOPMENT DETAILS

### Frontend

For the frontend part of the project, we have used HTML, CSS and JavaScript. Advantage of using these languages is that they are supported by all browsers and they can be integrated with any backend framework. Also, they are lightweight and thus make the system faster. For styling purposes, we used Bootstrap and Google Fonts. The advantage of using these frameworks in the frontend is that they help in creating responsive designs much faster than without them. They also provide cross-browser compatibility.

### Backend

For the backend, we used Python with the Django framework. One of the biggest advantages of using the Django framework is that it is independent and complete in itself. It does not require any external solution. Django is everything from ORM to the web browser itself. Also, codes in Django Framework are 'Keep It Short and Simple' and 'Don't repeat yourself' compliant. Moreover, python also opens up the possibility to use machine learning or AI based components in the project in future deployments.

As a database language we chose SQLite. Reasons for using this database language in place of others like MySQL and PostgreSQL are that SQLite is lightweight and thus provides better performance, does not require installation, is reliable and portable. Also, it works very well with our chosen Django Framework.

For version control and collaboration, we used git and GitHub respectively. It allowed us to divide our work and work parallelly in different branches and efficiently develop the app.

Page Break

## USER ROLES

There are two main types of roles available in our system.

- **PUBLIC:** This role is for the **People seeking Information** to Blood Donation. They don't need to sign in to look for the information. Anyone visiting our site is first taken to the Public Page. Here they are provided with various features (explained separately) like:
  - Register (For Blood Bank)
  - Login (For Blood Bank)
  - Donate Blood (For general public)
  - Look For Blood (For general public)

The Blood Bank also first visits the public Page first from where they can login to modify its information (Blood Details, Profile, Blood Camps, etc.). If a new Blood Bank want to join with the system, they can go to register and register as a new Blood Bank part of the system.

The simple user can look around the various information the site provides them. They can look Blood related information to either donate blood or search for blood available in listed Blood Banks.

- **BLOOD BANK:** This role is for **Blood Banks**. The Blood Bank can register with our system after filling all the details and create an account. They can visit the site and login into their account. They are provided with features of:
  - View and Update Blood Details (blood bank can maintain information of Blood Available to them. These are then made available to public view in Look For Blood)
  - Profile (for blood banks to check their profile and also to update the profile if required)
  - Add Blood Camp (blood banks can create new Blood Camps which are then available in Donate Blood for public who want to donate blood).

## IMPLEMENTED FUNCTIONALITY

- **Public Page:** Visiting the page takes a non-signed in user to Public Page. The Public Page offers various options to a person visiting the site. Person (Blood Bank) can *Register* in the system, *Sign In*. Person can also choose option to *Look For Blood* or *Donate Blood*.

RaktArpan
Sign In
Register
Donate Blood
Look for Blood

### Learn About Donation

After donating blood, the body works to replenish the blood loss. This stimulates the production of new blood cells and in turn, helps in maintaining good health.

Donate Now

| Compatible Blood Type Donors |                 |                    |
|------------------------------|-----------------|--------------------|
| Blood Type                   | Donate Blood To | Receive Blood From |
| A+                           | A+ AB+          | A+ A- O+ O-        |
| O+                           | O+ A+ B+ AB+    | O+ O-              |
| B+                           | B+ AB+          | B+ B- O+ O-        |
| AB+                          | AB+             | Everyone           |
| A-                           | A+ A- AB+ AB-   | A- O-              |
| O-                           | Everyone        | O- O-              |
| B-                           | B+ B- AB+ AB-   | B- O-              |
| AB-                          | AB+ AB-         | AB+ A- B- O-       |

### Types of donation

The human body contains five liters of blood, which is made of several useful components i.e. **Whole blood, Platelet, and Plasma**. Each type of component has several medical uses and can be used for different medical treatments. your blood donation determines the best donation for you to make. For **plasma** and **platelet** donation you must have donated whole blood in past two years.

#### Whole Blood

##### What is it?

Blood Collected straight from the donor after its donation usually separated into red blood cells, platelets, and plasma.

##### User For?

Stomach disease, kidney disease, childbirth, operations, blood loss, trauma, cancer, blood diseases, haemophilia, anemia, heart disease.

##### How long does it take?

15 minutes to donate.

##### How often can I donate?

[RakArpan](#)
[Sign In](#)
[Register](#)

[Donate Blood](#)
[Look for Blood](#)

usually separated into red blood cells, platelets, and plasma.

**Who can donate?**

You need to be 18-65 years old, weigh 45kg or more and be fit and healthy.

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**What is it?**

The straw-coloured liquid in which red blood cells, white blood cells, and platelets float in. Contains special proteins which can be used to create 18 different types of medical products to treat many different medical conditions.

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The straw-coloured liquid in which red blood cells, white blood cells, and platelets float in. Contains special proteins which can be used to create 18 different types of medical products to treat many different medical conditions.

**Who can donate?**

You need to be 18-70 (men) or 20-70 (women) years old, weigh 50kg or more and must have given successful whole blood donation in last two years.

**What is it?**

The tiny 'plates' in blood that wedge together to help to clot and reduce bleeding. Always in high demand. Vital for people with low platelet count, like malaria and cancer patients.

**Who can donate?**

You need to be 18-70 years old (men), weigh 50kg or more and have given a successful plasma donation in the past 12 months.

loss, trauma, cancer, blood diseases, haemophilia, anaemia, heart disease.

**Lasts For?**

Red cells can be stored for 42 days.

**Lasts For?**

Plasma can last up to one year when frozen.

**Lasts For?**

Just five days.

**How often can I donate?**

Every 12 weeks

**How often can I donate?**

Every 2-3 weeks.

**How often can I donate?**

Every 2 weeks

**Plasma**

**User For?**

Immune system conditions, pregnancy (including anti-D injections), bleeding shock, burns, muscle and nerve conditions, haemophilia, immunisations.

**User For?**

Cancer, blood diseases, haemophilia, anaemia, heart disease, stomach disease, kidney disease, childbirth, operations, blood loss, trauma, burns.

**How does it work?**

We collect your blood, keep plasma and return rest to you by apheresis donation.

**How does it work?**

We collect your blood, keep platelet and return rest to you by apheresis donation.

**How long does it take?**

15 minutes to donate.

**How long does it take?**

45 minutes to donate.

**How often can I donate?**

Every 2-3 weeks.

**How often can I donate?**

Every 2 weeks

[Find Nearest Blood Bank To Donate](#)

- Donate Blood:** This option is provided at the Public Page. This is intended to Common person visiting the site. Here all the Blood Camps available (for people to donate blood) is listed along with its information. Information listed are the *Camp Name, State, City, Date* (opening – closing date), *Time* (opening –closing time each day), *Location, Camp Organizer & Description related to the Blood Camp*. The page also comes with a **Filtering based on State & City**. *State and Cities are also linked* i.e. cities only present in a selected state, can only be selected. The entries are sorted based on the selected state and city.

[RakArpan](#)
[Sign In](#)
[Register](#)

[Donate Blood](#)
[Look for Blood](#)

State

Assam

City

Jorhat

| S No. | Camp Name | State | City   | Dates                   | Time          | Location | Organizer | Description |
|-------|-----------|-------|--------|-------------------------|---------------|----------|-----------|-------------|
| 1     | camp2     | Assam | Jorhat | 2022-04-09 - 2022-04-30 | 18:01 - 22:01 | loc5     | org2      | desc5       |
| 2     | camp3     | Assam | Jorhat | 2022-04-01 - 2022-04-23 | 20:02 - 23:02 | loc8     | org1      | desc5       |

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- Look For Blood:** This is one of the most important features of our system. Using this feature anyone visiting our webapp can look for Blood Available in various Blood Banks registered with the webapp. There is also a feature related to **Filtering** the entries is added. This filtering can be based on:

- State: User can choose the State user want to look the details in. If not chosen entries related to all state is shown.
- City: User can choose the city present in the chosen state to look for Blood Availability. If not chosen entries related to all available cities is shown.
- Blood Group: the user can even filter based on the required blood group (**A+, A-, B+, B-, O+, O-, AB+, AB-**). If not selected information related to all Blood Group is shown.
- Blood Component: Users are also given option to filter the search based on different Blood Component (**RBC, Platelets, Plasma, CyroAHF, Granulocytes**). If not chosen then Information related to all the blood component are shown.

The filter can be either one of them or any combination possible too (but State and City has to be both chosen if either is selected). Filter options can be chosen from the dropdown. After the Filters are added, only the entries with availability **greater than 0** are listed. This feature is to aid a person to search Blood as per their need faster.  
(Filter only on state & city)

| S No. | Blood Bank Name | Address                | Blood Component | Blood Group and Quantity                                     |
|-------|-----------------|------------------------|-----------------|--|
| 2     | gauravlg        | VH-10 12               | RBC             | A+ : 1 A- : 6 B+ : 1 B- : 3 AB+ : 13 AB- : 1 O+ : 1 O- : 1   |
| 3     | test2           | H.C. IT Karpur, Karpur | RBC             | A+ : 3 A- : 5 B+ : 4 B- : 16 AB+ : 4 AB- : 3 O+ : 12 O- : 13 |
| 3     | test2           | H.C. IT Karpur, Karpur | Plasma          | A+ : 11 A- : 4 B+ : 3 B- : 6 AB+ : 8 AB- : 10 O+ : 6 O- : 4  |
| 3     | test2           | H.C. IT Karpur, Karpur | Platelets       | A+ : 4 A- : 7 B+ : 3 B- : 2 AB+ : 9 AB- : 10 O+ : 3 O- : 6   |
| 3     | test2           | H.C. IT Karpur, Karpur | CryoAHF         | A+ : 6 A- : 11 B+ : 7 B- : 3 O+ : 3 O- : 5                   |
| 3     | test2           | H.C. IT Karpur, Karpur | Granulocytes    | B+ : 6 B- : 3 AB+ : 5 O+ : 4                                 |

(Filter on City, State & Blood Type)

| S No. | Blood Bank Name | Address                | Blood Component | Blood Group and Quantity |
|-------|-----------------|------------------------|-----------------|--------------------------|
| 2     | gauravlg        | VH-10 12               | RBC             | B+ : 1                   |
| 3     | test2           | H.C. IT Karpur, Karpur | RBC             | B+ : 4                   |

(Filter on City, State, Blood Component & Blood Group)

The screenshot shows the RaktArpan search interface. At the top, there are navigation links: RaktArpan, Sign In, Register, Donate Blood, and Look for Blood. Below these are four dropdown menus for filtering: State (Goa, Odisha, Punjab), City (Panaji), Blood Group (B+), and Blood Component (RBC). A red Search button is located below the filters. Below the search filters is a table with the following data:

| S No. | Blood Bank Name | Address                | Blood Component | Blood Group and Quantity |
|-------|-----------------|------------------------|-----------------|--------------------------|
| 2     | gaunarkg        | VH-10 12               | RBC             | B+ 1                     |
| 3     | test2           | H.C. RT Karpus, Karpur | RBC             | B+ 4                     |

- **Login:** Created a login page which redirects the user to the blood bank dashboard only accessible after login. It also displays the corresponding errors if incorrect/nonexistent credentials are entered. **Logout** is also provided to anytime logout of the system. Login redirects the Blood Bank from Public Page to their dashboard

The screenshot shows the RaktArpan login page. At the top, there are navigation links: RaktArpan, Sign Up, and Login. Below these is a LOGIN form with the following fields and buttons:

- Username field (containing gaunarkg)
- Password field (containing 123456)
- Login button
- Link: Don't have an account? Sign up

- **Register (Blood Bank Sign Up):** Login page comes with a signup button to create a user with blood bank role, if they are not already enrolled. The signup page takes user details and user given password to create a user profile for blood bank role. The signup page also has confirm password field to ease the users. The signup also asks for unique username & email, for each signup. It also asks new user to select **State** from the dropdown of states available & also then select **City from** dropdown of cities in that state.



- Blood Bank Profile Page:** Blood Bank role user has its own dashboard which has the profile button. This button will redirect the user to their corresponding profile page. Profile page contains different user info and also options to update certain features.

- Update Profile:** The Blood Bank Profile Page contains options to update the details selectively which can change over time. Currently Blood Bank can update/add details related to Contact Info.

Home Profile Add Blood Camp test1 Logout

Profile Successfully Updated!

|                          |                       |
|--------------------------|-----------------------|
| Name<br>test1            | User Name<br>test1    |
| Email<br>test1@itk.ac.in | Contact<br>1111111118 |
| Address<br>test1         | State<br>Goa          |
| City<br>Panaji           |                       |

Update Profile

Contact  
1111111118

Update

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- **Blood Bank Dashboard:** After login, the Blood Bank user is redirected to their role-based Blood Bank dashboard page. The dashboard is the home menu after login.

This comes with **View and Update Blood Details** which list of all the Blood Details available in the Blood Bank. Our app covers five types of blood items & information related to each is kept. Each sections shows corresponding Blood groups units present currently, then value it needed to be update and button to update the changes. This menu is thus divided in 5 sections.

- **RBC Details:** This section contains info of RBC units present in the Blood Bank for each blood group (A+, A-, B+, B-, O+, O-, AB+, AB-).
- **Platelets Details:** This section contains info of Platelets units present in the Blood Bank for each blood group (A+, A-, B+, B-, O+, O-, AB+, AB-).
- **Plasma:** This section contains info of Plasma units present in the Blood Bank for each blood group (A+, A-, B+, B-, O+, O-, AB+, AB-).
- **CryoAHF:** This section contains info of CyroAHF units present in the Blood Bank for each blood group (A+, A-, B+, B-, O+, O-, AB+, AB-).
- **Granulocytes:** This section contains info of Granulocyte units present in the Blood Bank for each blood group (A+, A-, B+, B-, O+, O-, AB+, AB-).

Each section comes with Update Button, after changing the required Units which has to be changed, Update Button can be clicked to update the details in the Database.

Rak Arpan
Profile
Add Blood Camp
test
Logout

### View and Update Blood Details

#### RBC Details

| SNo. | Blood Type | Current Stock | Update Stock                   |
|------|------------|---------------|--------------------------------|
| 1.   | A+         | 0             | <input type="text" value="0"/> |
| 2.   | A-         | 0             | <input type="text" value="0"/> |
| 3.   | B+         | 0             | <input type="text" value="0"/> |
| 4.   | B-         | 5             | <input type="text" value="5"/> |
| 5.   | O+         | 0             | <input type="text" value="0"/> |
| 6.   | O-         | 3             | <input type="text" value="3"/> |
| 7.   | AB+        | 0             | <input type="text" value="0"/> |
| 8.   | AB-        | 0             | <input type="text" value="0"/> |

Update Details

#### Platelets Details

| SNo. | Blood Type | Current Stock | Update Stock                   |
|------|------------|---------------|--------------------------------|
| 1.   | A+         | 0             | <input type="text" value="0"/> |
| 2.   | A-         | 0             | <input type="text" value="0"/> |
| 3.   | B+         | 0             | <input type="text" value="0"/> |

#### CryoAHF Details

| SNo. | Blood Type | Current Stock | Update Stock                   |
|------|------------|---------------|--------------------------------|
| 1.   | A+         | 0             | <input type="text" value="0"/> |
| 2.   | A-         | 0             | <input type="text" value="0"/> |
| 3.   | B+         | 5             | <input type="text" value="5"/> |
| 4.   | B-         | 0             | <input type="text" value="0"/> |
| 5.   | O+         | 6             | <input type="text" value="6"/> |
| 6.   | O-         | 0             | <input type="text" value="0"/> |
| 7.   | AB+        | 5             | <input type="text" value="5"/> |
| 8.   | AB-        | 0             | <input type="text" value="0"/> |

Update Details

#### Granulocytes Details

| SNo. | Blood Type | Current Stock | Update Stock                   |
|------|------------|---------------|--------------------------------|
| 1.   | A+         | 0             | <input type="text" value="0"/> |
| 2.   | A-         | 0             | <input type="text" value="0"/> |
| 3.   | B+         | 0             | <input type="text" value="0"/> |
| 4.   | B-         | 0             | <input type="text" value="0"/> |
| 5.   | O+         | 0             | <input type="text" value="0"/> |

- Add Blood Camp:** Blood Camp User can create new blood camps which then becomes available in Donate Blood page. This page takes information from the Blood Bank (user) and then add it to the database. It contains two types of information: 1. Blood Bank Details 2. Camp Details.
  - Blood Bank Details:** These are the details of the corresponding Blood Bank conducting the Blood Camp. These are **Auto-Filled** from the Details of the Blood Bank User.
  - Camp Details:** This contains the details related to the Blood Camp. Information includes *Camp Name*, *Camp Organizer*, *Start Date & End Date* (of the camp), *Daily Start & End Time* of the camp, *Camp Location*, and some *Description* related to the camp to provide some additional information related

to the Camp. All these details are to be provided by the Blood Bank hosting the Blood Camp.

After all the details are filled, Blood Bank can publish the Blood Camp for public viewing (via Donate Blood).

[Home](#) [Profile](#) [Add Blood Camp](#) test1 Logout

### Blood Camp Form

**Blood Bank Details**

Blood Bank Name

test1

Contact

1111111111

State

Goa

City

Panaji

Address

test1

**Camp details**

Camp Name

Camp Name

Camp Organizer

Camp Organizer

Start Date

dd/mm/yyyy

End Date

dd/mm/yyyy

Start Time

--:--

End Time

--:--

Camp Location

Description

Submit Form

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