BLOOD BANK MANAGEMENT SYSTEM

C Programming Major Project

CSEG1032

University of Petroleum and Energy Studies

School of Computer Science

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GitHub Repository:

https://github.com/vedanshpandey4800-cmyk/BLOOD-BANK-MANAGEMENT-SYSTEM

ABSTRACT

This project implements a console-based Blood Bank Management System in C programming language, demonstrating mastery of all 6 course units (variables, arrays, structures, functions, strings, I/O).

KEY FEATURES:

- **Add Donor: Complete profile (ID, Name, Blood Group, Phone, Age, Address)**
- **View Donors: Professional formatted table display**
- **Request Blood: Instant emergency blood group matching**
- **Menu System: User-friendly 4-option interface**

TECHNICAL SPECIFICATIONS:

- **Data Structure: struct Donor array (MAX_DONORS = 100)**
- **String Matching: strcmp() for blood group search**
- **Compilation: gcc -o bloodbank main.c**

3. PROBLEM DEFINITION

PROBLEM STATEMENT:

Manual blood bank operations suffer from:

ISSUE	IMPACT
? No digital database	Complete data loss
? Manual donor search	5-10 minutes delay
? No emergency system	Life-threatening

PROJECT OBJECTIVES:

1. **Fast donor registration (<30 seconds)**
2. **Instant blood group matching (<1 second)**
3. **Professional table-formatted display**
4. **Robust error handling and input validation**

4. SYSTEM DESIGN

4.1 ALGORITHM

```
ALGORITHM: BloodBankManagementSystem()
BEGIN
   1. Initialize:
      donors[MAX_DONORS] ← empty array
      donorCount ← 0

   2. WHILE (choice ≠ 4) DO
      2.1 DISPLAY Menu:
         1. Add Donor
         2. View Donors
         3. Request Blood
         4. Exit

      2.2 READ choice FROM user

      2.3 SWITCH (choice)
         CASE 1: CALL addDonor()
         CASE 2: CALL displayDonors()
         CASE 3: CALL requestBlood()
```

```
        CASE 4: BREAK
        DEFAULT: DISPLAY "Invalid Choice!"
      END SWITCH

   3. DISPLAY "Thank You!"
   4. END
END
ALGORITHM: BloodBankManagementSystem()
BEGIN
   1. Initialize:
      donors[MAX_DONORS] ← empty array
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   2. WHILE (choice ≠ 4) DO
      2.1 DISPLAY Menu:
        1. Add Donor
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      2.2 READ choice FROM user
      2.3 SWITCH (choice)
        CASE 1: CALL addDonor()
        CASE 2: CALL displayDonors()
        CASE 3: CALL requestBlood()
        CASE 4: BREAK
        DEFAULT: DISPLAY "Invalid Choice!"
      END SWITCH

   3. DISPLAY "Thank You!"
   4. END
END
ALGORITHM: addDonor()
BEGIN
   1. IF (donorCount ≥ MAX_DONORS) THEN
        DISPLAY "Maximum limit reached!"
        RETURN
   2. ELSE
        READ name INTO donors[donorCount].name
        READ bloodGroup INTO donors[donorCount].bloodGroup
        READ phone INTO donors[donorCount].phone
        READ age INTO donors[donorCount].age
        READ address INTO donors[donorCount].address

        donors[donorCount].id ← ++donorCount
        DISPLAY "Donor added successfully! ID: ", donors[donorCount-1].id
   3. END IF
END
ALGORITHM: requestBlood()
BEGIN
   1. READ neededBloodGroup FROM user

   2. found ← 0
   3. FOR i ← 0 TO donorCount-1 DO
        IF (strcmp(donors[i].bloodGroup, neededBloodGroup) == 0) THEN
          DISPLAY "Donor #", donors[i].id, ": ", donors[i].name, " (", donors[i].phone, ")"
          found ← found + 1
        END IF
    4. END FOR

    5. IF (found == 0) THEN
        DISPLAY "No ", neededBloodGroup, " donors available!"
    6. ELSE
        DISPLAY found, " ", neededBloodGroup, " donors found!"
    7. END IF
END
```
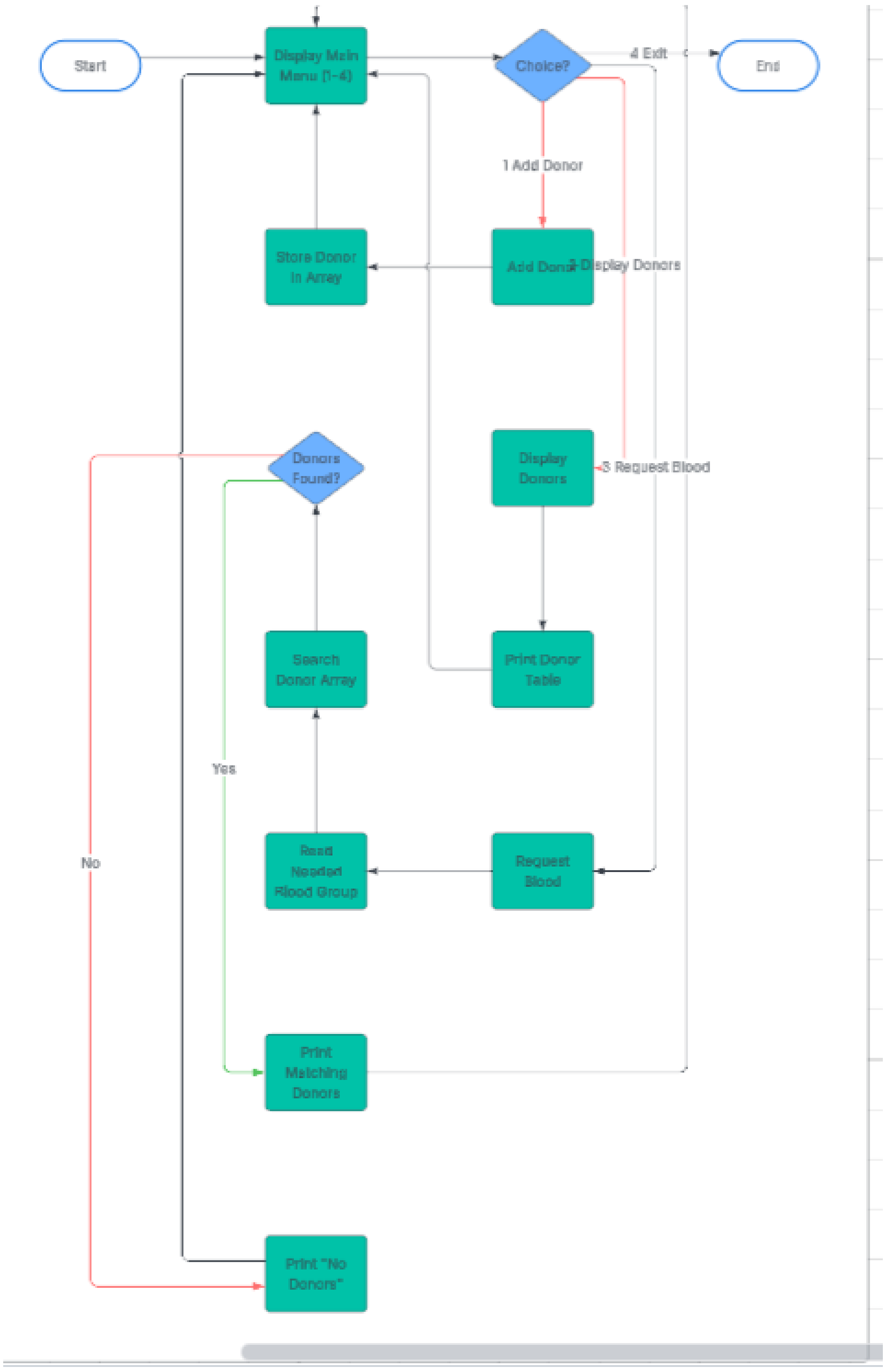

4.2.FLOWCHART



5. IMPLEMENTATION DETAILS

5.1 DATA STRUCTURE

```
#define MAX_DONORS 100

struct Donor {
    int id;
    char name[50];
    char bloodGroup[5];  // A+, O+, B+, etc.
    char phone[15];
    int age;
    char address[100];
};

struct Donor donors[MAX_DONORS];
int donorCount = 0;
```

5.2 KEY FUNCTIONS

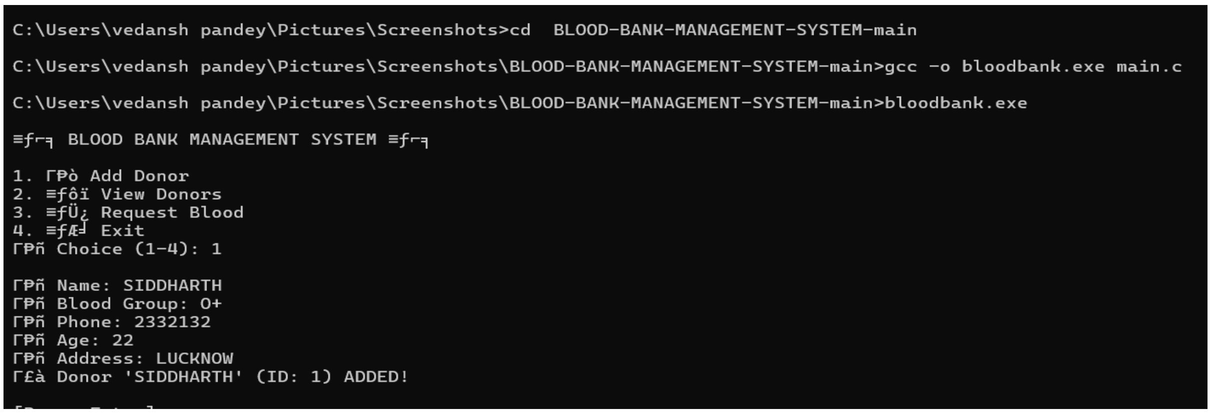
```
void addDonor() {
    // Input validation + array storage
    donors[donorCount].id = ++donorCount;
    printf("✅ Donor added! ID: %d\n", donors[donorCount-1].id);
}

void requestBlood() {
    char needed[5];
    scanf("%s", needed);
    // Loop through array, strcmp() matching
    // Display matching donors
}
```

6.

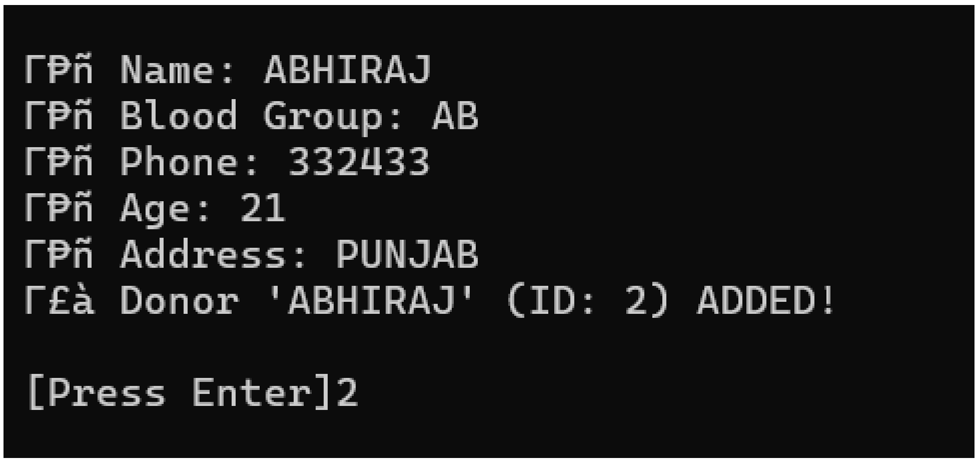
TEST CASE TABLE

TEST CASE ID	DESCRIPTION	INPUT	EXPECTED OUTPUT	ACTUAL OUTPUT	REMA
01	ADD NEW DONOR	1 RAM O+ 32332225 DELHI	DONOR “RAM” ADDED	DONOR “RAM” ADDED	ID GENE RATED
02	VIEW DONOR LIST	2	“RAM” “O+” ID-01	“RAM” “O+” ID-01	TABLE FORM ATTIN
03	REQUEST DONOR	3 O+	RAM	RAM	
04	EXIT	4	EXIT	EXIT	

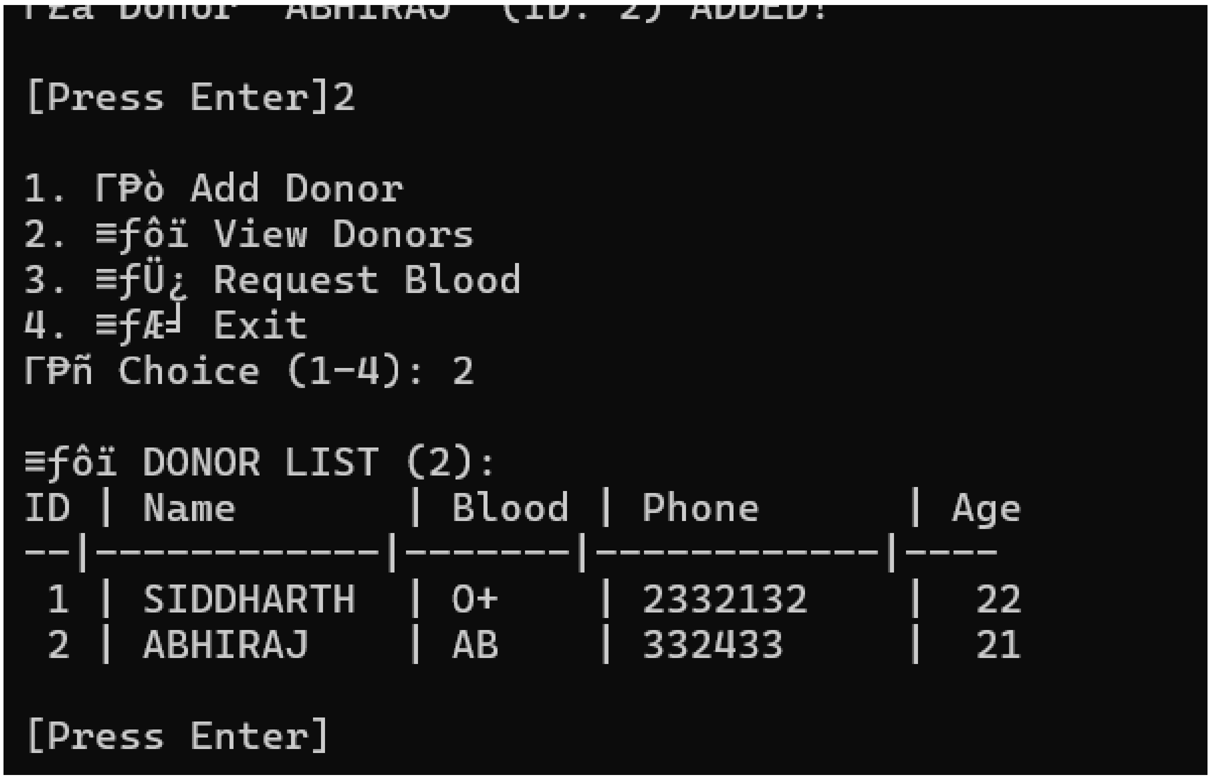
6.2.SCREENSHOTS



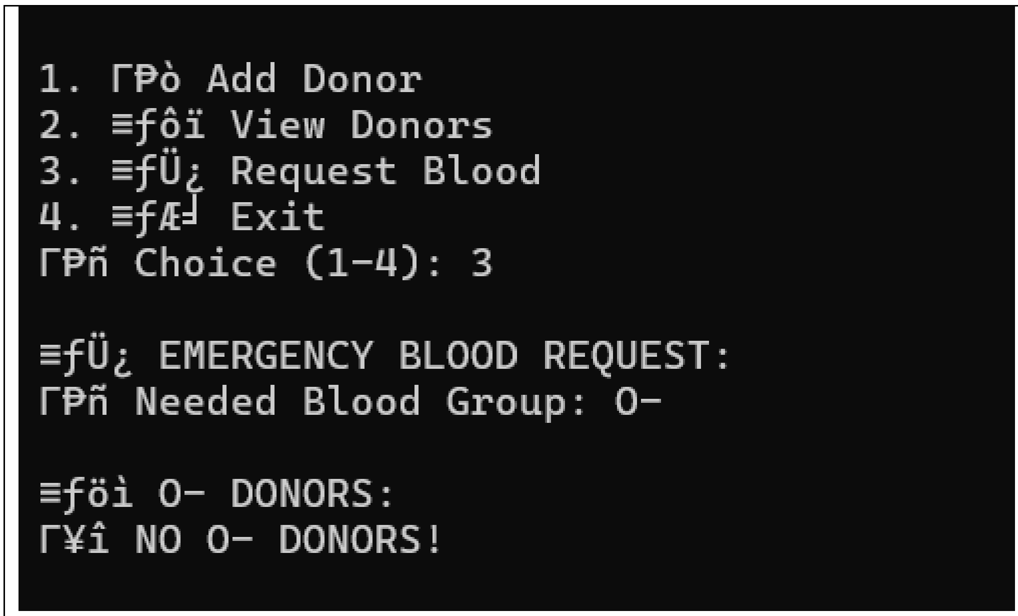
```
C:\Users\vedansh pandey\Pictures\Screenshots>cd  BLOOD-BANK-MANAGEMENT-SYSTEM-main

C:\Users\vedansh pandey\Pictures\Screenshots\BLOOD-BANK-MANAGEMENT-SYSTEM-main>gcc -o bloodbank.exe main.c

C:\Users\vedansh pandey\Pictures\Screenshots\BLOOD-BANK-MANAGEMENT-SYSTEM-main>bloodbank.exe

≡ƒ⌐╕ BLOOD BANK MANAGEMENT SYSTEM ≡ƒ⌐╕

1. ΓÞò Add Donor
2. ≡ƒôï View Donors
3. ≡ƒÜ¿ Request Blood
4. ≡ƒÆ╛ Exit
ΓÞñ Choice (1-4): 1

ΓÞñ Name: SIDDHARTH
ΓÞñ Blood Group: O+
ΓÞñ Phone: 2332132
ΓÞñ Age: 22
ΓÞñ Address: LUCKNOW
Γ£à Donor 'SIDDHARTH' (ID: 1) ADDED!
```



```
ΓÞñ Name: ABHIRAJ
ΓÞñ Blood Group: AB
ΓÞñ Phone: 332433
ΓÞñ Age: 21
ΓÞñ Address: PUNJAB
Γ£à Donor 'ABHIRAJ' (ID: 2) ADDED!

[Press Enter]2
```



```
Γ£à Donor 'ABHIRAJ' (ID: 2) ADDED!

[Press Enter]2

1. ΓÞò Add Donor
2. ≡ƒôï View Donors
3. ≡ƒÜ¿ Request Blood
4. ≡ƒÆ╛ Exit
ΓÞñ Choice (1-4): 2

≡ƒôï DONOR LIST (2):
ID | Name         | Blood | Phone        | Age
--|------------|-------|------------|----
 1 | SIDDHARTH   | O+    | 2332132     |  22
 2 | ABHIRAJ     | AB    | 332433      |  21

[Press Enter]
```



```
1. ΓÞò Add Donor
2. ≡ƒôï View Donors
3. ≡ƒÜ¿ Request Blood
4. ≡ƒÆ╛ Exit
ΓÞñ Choice (1-4): 3

≡ƒÜ¿ EMERGENCY BLOOD REQUEST:
ΓÞñ Needed Blood Group: O-

≡ƒöì O- DONORS:
Γ¥î NO O- DONORS!
```

7.CONCLUSION & FUTURE WORK

7.1 CONCLUSION

THIS PROJECT SUCCESSFULLY DEMONSTRATES THE USE OF FUNCTIONS

AND STRUCTURES IN C. THIS PROJECT ALSO HELP IN SOLVING THE REALWORLD PROBLEM OF BLOOD DONOR REQUIREMENT

7.2 FUTURE ENHANCEMENTS:

- File I/O for data persistence
- Advanced search by name/location
- Blood inventory management
- SMS notification system

8. REFERENCES

1. Kernighan, B.W., Ritchie, D.M. The C Programming Language (2nd Edition)

2. UPES CSEG1032 Course Material

3. GitHub Example Repository: https://github.com/aalavandhaann/Major-Project-Example.git

THANK YOU