GOA COLLEGE OF ENGINEERING

DEPARTMENT OF COMPUTER ENGINEERING

SUBJECT: - [CE 340] Object Oriented Programming System

FACULTY: - **Prof. AMIT PATIL** **CLASS: - S.E COMPUTER (III) RC 2019**

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PLATFORM: - Dev C++/VS 2010 **YEAR: - 31st July 23 to Dec 2023**

Date of Announcement: 2-8-23

Date of Submission: 16-8-23

Assignment No-1

1.Write a C program to implement a Banking System Application using array of structure variables. Program should be provided following functionalities.

1. Dynamically reserve the memory for array of structure variables by inputting 'n' from user as the number of customers.
2. A/C number should get generated automatically
3. Menue driven o/p for providing deposite, withdrwal and check balance functionality
4. All above operations should be performed only when A/C number is validated.
5. For withdrawal operations minimum balance of 500/- needs to be checked .
6. Number of transaction performed should be displayed for every customer.

```
#include <iostream>
#include<string.h>
#include<time.h>
#include<stdlib.h>
using namespace std;

#define CLEAR_SCREEN (cout<<"\033[2J"<<"\033[H")
#define MENU (cout<<"******** MENU ********\n 1. Deposit\n 2. Withdraw\n 3. Check Balance \n 4. Exit\n")

int base = rand()*100;

struct account
{
   int acc_no;
   char name[20];
   float balance;
   int trans;
};

void create_account(struct account *p,int i);
void deposit(struct account *p);
bool withdraw(struct account *p);
void check_balance(struct account *p);
bool close();
```

```
struct account* search(struct account *p, int acc_no, int n);

int main()
{
   int n;
   bool loop=true;
   int choice;
   cout<<"Enter the number of Customers: ";
   cin>>n;
   if(n==0) exit(0);
   struct account *p = (struct account*)malloc(n*sizeof(struct account));
   for(int i=0; i<n; i++)
   {
      create_account(&p[i],i);
   }
   while(loop){
      int acc_no;
      struct account *pass;
      char c;
      cout<<"\nEnter Account Number: "; cin>>acc_no;
      pass = search(p,acc_no,n);
      if(pass == NULL){
         CLEAR_SCREEN;
         cout<<"\nAccount not found!"<<endl; loop = close();
      }
      else{
         MENU;
         cin>>choice;
         switch(choice)
         {
            case 1 : deposit(pass);
                  CLEAR_SCREEN; loop = close(); break;
            case 2 : if(withdraw(pass)){ CLEAR_SCREEN; cout<<"\nTransaction Sucessful!\n";
                  loop = close(); break; }
                  else  {cout<<"\nExceded withdraw trials!\nRe-enter credentials or ";
                  loop = close() ;break;}
            case 3 : check_balance(pass); loop = close(); break;
            case 4 : loop = false; break;
            default : CLEAR_SCREEN; cout<<"\nInvalid input!\n"; loop = close(); break;
         }
      }
   }
   CLEAR_SCREEN;
   return 0;
}

void create_account(struct account *p,int i)
{
   cout<<"\nEnter Name: ";
   cin>>p->name;
   p->acc_no = base+i;
   cout<<"\nYour Account number is : "<<p->acc_no<<endl;
   p->trans = 0;
   p->balance = 0;
}
void deposit(struct account *p)
{
   CLEAR_SCREEN;
```

```
   float temp;
   cout<<"\nEnter deposit ammout : "; cin>>temp;
   p->balance+=temp;
   p->trans++;
   CLEAR_SCREEN;
}
bool withdraw(struct account *p)
{
   CLEAR_SCREEN;
   float temp; int loop=3;
   while(loop>0){
   cout<<"\nEnter withdraw amount: "; cin>>temp;
   if(temp<500){
      CLEAR_SCREEN;
      cout<<"\nEnter Greater ammount!"<<endl;
      loop--;
   }
   else if(temp>p->balance){
      CLEAR_SCREEN;
      cout<<"\nExceding account balance!"<<endl;
      loop--;
   }
   else{
      p->balance -= temp;
      p->trans++;
      return true;
   }
   }
   return false;
}
void check_balance(struct account *p)
{
   cout<<"Account Holder: "<<p->name<<endl;
   cout<<"Account Number: "<<p->acc_no<<endl;
   cout<<"Balance Number: "<<p->balance<<endl;
}
bool close()
{
   char c;
   cout<<"\nDO you want to continue (y/n): "; cin>>c;
   if(c=='y'||c=='Y') {  CLEAR_SCREEN; return true;}
   else {CLEAR_SCREEN; return false;}
}
struct account* search(struct account *p, int acc_no, int n)
{
   for(int i=0; i<n; i++){
      if(p[i].acc_no == acc_no)
         return &p[i];
   }
   return NULL;
}
```

Output:

```
Enter the number of Customers: 2

Enter Name: asdf
```

Your Account number is : 4100

Enter Name: zxcv

Your Account number is : 4101

Enter Account Number: 4100
******** MENU ********
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
1

Your Account number is : 4100

Enter Name: zxcv

Enter deposit ammout :5000

Enter Name: zxcv

DO you want to continue (y/n):y

Enter Account Number: 4100
******** MENU ********
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
2

Enter withdraw ammount: 1234

Transaction Sucessful!

DO you want to continue (y/n): y

Enter Account Number: 4100
******** MENU ********
1. Deposit
2. Withdraw
3. Check Balance
4. Exit
3
Account Holder: asdf
Account Number: 4100
Balance Number: 3766

DO you want to continue (y/n):n

2. An electricity board charges the following rates to domestic users to discourage large consumption of energy

1. for first 100 units 60 p per unit
2. for next 200 units 80 p per unit
3. beyond 300 units 90 p per unit

All users are charged a minimum of 50 rupees. If the total amount is over 300 rupees than an additional surcharge of 15$ is added. Write a c++ code to read the number of unit's consumed and print out the charges with names of consumer.

```
#include <iostream>
#include <string>
#include<iomanip>
using namespace std;

#define CLEAR_SCREEN (cout<<"\033[2J"<<"\033[H")

int main()
{
   string consumerName;
   int unitsConsumed;
   double totalAmount = 0.0;
   bool loop =  true;
   char c;

   while (loop)
   {
      cout << "Enter the name of the consumer: ";
      getline(cin, consumerName);
      cout << "Enter the number of units consumed: ";
      cin >> unitsConsumed;
      CLEAR_SCREEN;
      // Calculate charges based on the given rates
      cout<<"**********ELECTRICITY BILL**********"<<endl;
      cout<<"Consumer name: "<<consumerName<<endl;
      if (unitsConsumed > 100)
      {
         totalAmount = 100 * 0.60;
         cout<<setw(30)<<left<<"First 100 units: Rs. "<<totalAmount<<endl;
      }
      if (unitsConsumed <= 100)
      {
         totalAmount = unitsConsumed * 0.60;
         if (totalAmount<50){cout<<setw(30)<<left<<"First 100 units: Rs. 50"<<endl;}
         else{cout<<setw(30)<<left<<"First 100 units: Rs. "<<totalAmount<<endl;}
      }
      if(unitsConsumed <= 300)
      {
         totalAmount += (unitsConsumed - 100) * 0.80;
         cout<<setw(30)<<left<<"101 - 300 units: Rs. "<<( unitsConsumed - 100) * 0.80 <<endl;
      }

      if(unitsConsumed > 300)
      {
         totalAmount += 300 * 0.80;
         cout<<setw(30)<<left<<"For 101 - 300 units: Rs. "<<300 * 0.80<<endl;
         totalAmount += (unitsConsumed-300) * 90;
         cout<<setw(30)<<left<<"For >300 units: Rs. "<<(unitsConsumed-300) * 90<<endl;
```

```
    }

    cout<<setw(30)<<"Total : Rs. "<<totalAmount<<endl;
    // Check if additional surcharge is required
    if (totalAmount > 300.0)
    {
      cout<<"Additional surcharge of 15% for total amount going beyond Rs. 300"<<endl;
      totalAmount += totalAmount * 0.15;
    }

    cout <<setw(30)<<left<<"Total Charges: Rs. " << totalAmount << endl;

    cout<<"Do you want to exit ? (y/n) : ";
    cin>>c;
    if(c=='y'||c=='Y') {  CLEAR_SCREEN; loop = false;}
    else {CLEAR_SCREEN;}
    getchar();
  }
  return 0;
}
```

Output:

```
Enter the name of the consumer: Divyam
Enter the number of units consumed: 250

**********ELECTRICITY BILL**********
Consumer name: Divyam
First 100 units: Rs.         60
101 - 300 units: Rs.         120
Total : Rs.                  180
Total Charges: Rs.           180
Do you want to exit ? (y/n) : y
```

3. A election is contested by 5 candidates. The candidates are marked from 1 to 5 and the votes is done by marking the numbers on the ballet paper. Write a program to read the ballots and count the vote cast for each candidate in an array variable count. In case a number outside 1 to 5 is cast the vote should be considered to be spoilt ballot and the program should also be able to count the number of spoilt ballot.

```
#include <iostream>
using namespace std;

const int NUM_CANDIDATES = 5;

class Candidate {
public:
  int candidateNumber;
  int votes;

  Candidate() {
    candidateNumber = 0;
    votes = 0;
  }
};

int main() {
  Candidate candidates[NUM_CANDIDATES];
  int spoiltBallotCount = 0;
```

```
    int ballot;

    cout << "Enter the ballots (Enter -1 to stop):" << endl;

    while (true) {
        cin >> ballot;

        if (ballot == -1) {
            break;
        }

        if (ballot >= 1 && ballot <= NUM_CANDIDATES) {
            candidates[ballot - 1].votes++;
        } else {
            spoiltBallotCount++;
        }
    }

    cout << "\nVote count for each candidate:" << endl;
    for (int i = 0; i < NUM_CANDIDATES; i++) {
        cout << "Candidate " << i + 1 << ": " << candidates[i].votes << " votes" << endl;
    }

    cout << "Spoilt Ballots: " << spoiltBallotCount << endl;

    return 0;
}
```

Output:

```
Enter the ballots (Enter -1 to stop):
1 2 3 4 5 2 3 1 3 5 6 3 1 2 4 6 7 4 2 0 7 3 12 3
-1

Vote count for each candidate:
Candidate 1: 3 votes
Candidate 2: 4 votes
Candidate 3: 6 votes
Candidate 4: 3 votes
Candidate 5: 2 votes
Spoilt Ballots: 6
```