VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Assignment – I

CSE2010 - Advanced C Programming

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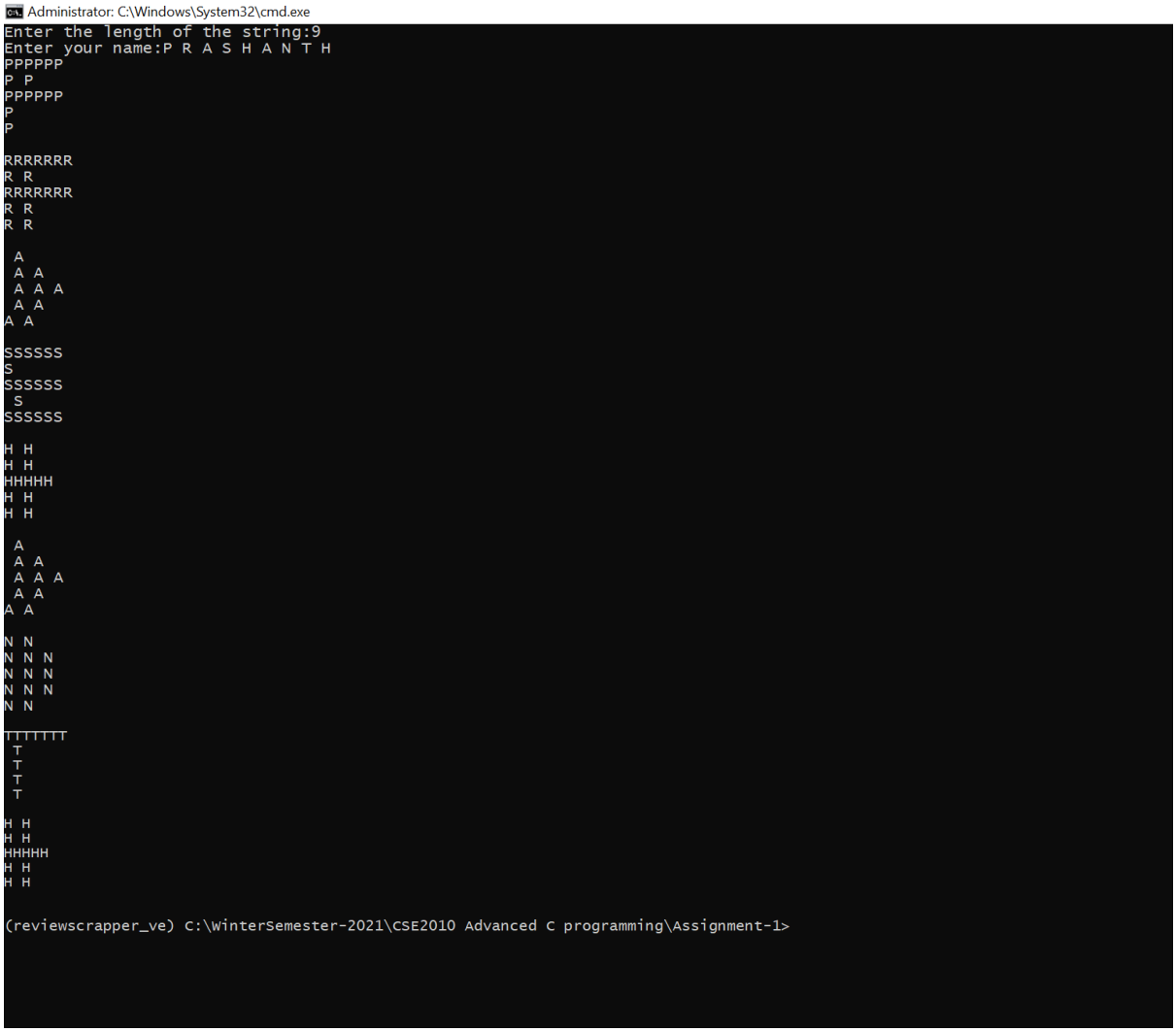
1. Write a C program to print your First name using printf statement. For example if the name is "ABI", then the output should be (2 marks)

Program-code

```c
#include<stdio.h>
int main()
{
    int n,i;
    char a[20];
    printf("Enter the length of the string:");
    scanf("%d",&n);
    printf("Enter your name:");

    for(i=0;i<n;i++)
    scanf("%s",&a[i]);
        for(i=0;i<n;i++)
        {
            if(a[i]=='A')
            {
            printf(" A\n");
            printf(" A A\n");
            printf(" A A A\n");
            printf(" A A\n");
             printf("A A\n");
             printf("\n");
             }

        else if(a[i]=='H')
        {
        printf("H H \n");
        printf("H H \n");
        printf("HHHHH \n");
        printf("H H \n");
        printf("H H \n");
        printf("\n");
        }

        else if(a[i]=='N')
        {
        printf("N N \n");
        printf("N N N \n");
```

```
38          printf("N N N \n");
39          printf("N N N \n");
40          printf("N N \n");
41          printf("\n");
42          }
43
44          else if(a[i]=='P')
45          {
46          printf("PPPPPP \n");
47          printf("P P \n");
48          printf("PPPPPP \n");
49          printf("P \n");
50          printf("P \n");
51          printf("\n");
52          }
53
54          else if(a[i]=='R')
55          {
56          printf("RRRRRRR \n");
57          printf("R R \n");
58          printf("RRRRRRR \n");
59          printf("R R \n");
60          printf("R R \n");
61          printf("\n");
62
63          }
64          else if(a[i]=='S')
65          {
66          printf("SSSSSS \n");
67          printf("S \n");
68          printf("SSSSSS \n");
69          printf(" S \n");
70          printf("SSSSSS \n");
71          printf("\n");
72          }
73          else if(a[i]=='T')
74        {
75        printf("TTTTTTT \n");
76        printf(" T \n");
77        printf(" T \n");
78        printf(" T \n");
79        printf(" T \n");
80        printf("\n");
81        }
82    }
83    return 0;
84 }
85
86
```

Output


Administrator: C:\Windows\System32\cmd.exe
Enter the length of the string:9
Enter your name:P R A S H A N T H
PPPPPP
P P
PPPPPP
P
P
RRRRRRR
R R
RRRRRRR
R R
R R
A
A A
A A A
A A
A A
SSSSSS
S
SSSSSS
S
SSSSSS
H H
H H
HHHHH
H H
H H
A
A A
A A A
A A
A A
N N
N N N
N N N
N N N
N N
TTTTTTT
T
T
T
T
H H
H H
HHHHH
H H
H H
(reviewscrapper_ve) C:\WinterSemester-2021\CSE2010 Advanced C programming\Assignment-1>

Program-code

```
#include<stdio.h>
int main()
{
        int n,i;
        char a[20];
        printf("Enter the length of the string:");
        scanf("%d",&n);
        printf("Enter your name:");

        for(i=0;i<n;i++)
        scanf("%s",&a[i]);
                for(i=0;i<n;i++)
                {
                        if(a[i]=='A')
                        {
                        printf(" A\n");
                        printf(" A A\n");
                        printf(" A A A\n");
                        printf(" A A\n");
                        printf("A A\n");
                        printf("\n");
                        }

                else if(a[i]=='H')
                {
                printf("H H \n");
                printf("H H \n");
                printf("HHHHH \n");
                printf("H H \n");
                printf("H H \n");
                printf("\n");
                }

                else if(a[i]=='N')
                {
                printf("N N \n");
                printf("N N N \n");
                printf("N N N \n");
                printf("N N N \n");
                printf("N N \n");
                printf("\n");
                }

                else if(a[i]=='P')
                {
                printf("PPPPPP \n");
```

```
                printf("P P \n");
                printf("PPPPPP \n");
                printf("P \n");
                printf("P \n");
                printf("\n");
                }

                else if(a[i]=='R')
                {
                printf("RRRRRRR \n");
                printf("R R \n");
                printf("RRRRRRR \n");
                printf("R R \n");
                printf("R R \n");
                printf("\n");

                }
                else if(a[i]=='S')
                {
                printf("SSSSSS \n");
                printf("S \n");
                printf("SSSSSS \n");
                printf(" S \n");
                printf("SSSSSS \n");
                printf("\n");
                }
                else if(a[i]=='T')
                {
                printf("TTTTTTT \n");
                printf(" T \n");
                printf(" T \n");
                printf(" T \n");
                printf(" T \n");
                printf("\n");
                }
        }
        return 0; }
```

Output

```
Enter the length of the string:9
Enter your name:P R A S H A N T H
PPPPPP
P P
PPPPPP
P
P

RRRRRRR
```

```
R R
RRRRRRR
R R
R R

 A
 A A
 A A A
 A A
A A

SSSSSS
S
SSSSSS
 S
SSSSSS

H H
H H
HHHHH
H H
H H

 A
 A A
 A A A
 A A
A A

N N
N N N
N N N
N N N
N N

TTTTTTT
    T
    T
    T
    T
H H
H H
HHHHH
H H
H H
```

2. There are three batsmen from a state. The state government likes to present the best batsman award. Given the name and runs of each person, write a C program to find the best batsman using ternary operator. (1 mark)

Program-code

```c
/*Prashanth.S 19MID0020*/

#include<stdio.h>
#include<conio.h>
int main()
{
    // row --> index number of the words
    // column --> particular character in that word

    printf("The data-base is \n");

    char name[][20] = {"Sachin" , "Dravid" , "Raina"};
    int score[3] = {90,34,79};

    for(int i=0;i<3;i++) {
        printf("%s scores : %d runs\n",name[i],score[i]);
    }
    printf("Highest hitter  ");

    ((score[0]>score[1]) && (score[0]>score[2])) ?   // 1st if
        printf("%s scored %d",name[0],score[0]):

        (score[1]>score[2]) ?  // 2nd if
            printf("%s who scored %d runs ",name[1],score[1]):
            printf("%s who scored %d",name[2],score[2]);
    return 0;
}
```

Output

Program-code

```
#include<stdio.h>
#include<conio.h>
int main()
{
	// row --> index number of the words
	// column --> particular character in that word

	printf("The data-base is \n");

	char name[][20]		= {"Sachin" , "Dravid" , "Raina"};
	int score[3] = {90,34,79};

	for(int i=0;i<3;i++) {
		printf("%s scores : %d runs\n",name[i],score[i]);
	}
	printf("Highest hitter  ");

	((score[0]>score[1]) && (score[0]>score[2])) ?   // 1st if
		printf("%s scored %d",name[0],score[0]):

		(score[1]>score[2]) ?  // 2nd if
			printf("%s who scored %d runs ",name[1],score[1]):
			printf("%s who scored %d",name[2],score[2]);
	return 0;
}
```

Output

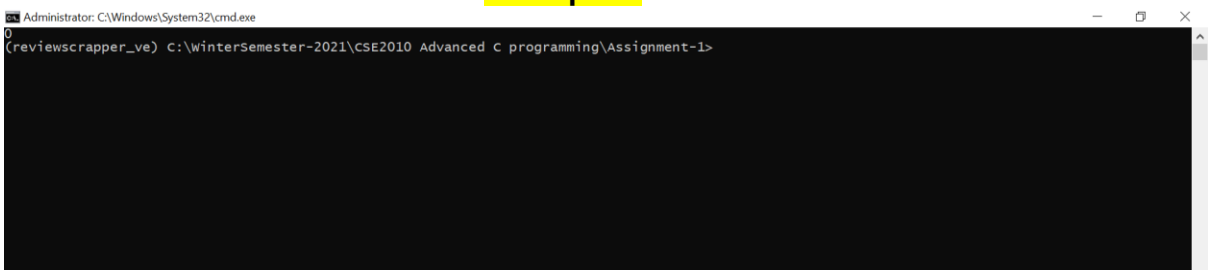
```
The data-base is
Sachin scores : 90 runs
Dravid scores : 34 runs
Raina scores : 79 runs
Highest hitter  Sachin scored 90
C:\WinterSemester-2021\CSE2010 Advanced C programming\Assignment-1>
```

3. Let a=0,b=2, c=-2,Find the output of the following expression and also state the reason (1 mark)
--a*(10-b)/2-c++*b+(a+b+c)

Program-code

```c
#include<stdio.h>
#include<conio.h>

int main() {
    int a = 0;
    int b = 2;
    int c = -2;

    int result = --a*(10-b)/2-c++*b+(a+b+c);
    printf("%d",result);
    return 0;
```

Output



Program-code

```c
#include<stdio.h>
#include<conio.h>

int main() {
        int a = 0;
        int b = 2;
        int c = -2;

        int result = --a*(10-b)/2-c++*b+(a+b+c);
        printf("%d",result);
        return 0;
}
```

Output

```
0
(reviewscrapper_ve) C:\WinterSemester-2021\CSE2010 Advanced C programming\Assignment-1>
```

1st Precedence → Pre-Increment and Post-increment Associativity
2nd Precedence → Parenthesis
3rd Precedence → Multiplication (Associativity → left to right) and then only division

4. Write a C program to count the number of vowels and consonants in your name irrespective of their case (upper or lower case). The letters b,h,s,p and empty spaces must be considered as special characters not as consonant. (2 marks)

Program-code

```c
/*Prashanth.S 19MID0020*/

#include<stdio.h>
#include<conio.h>

#include<ctype.h>
#include<string.h>

int main()
{
    int n;
    printf("Enter the length of your name : ");
    scanf("%d",&n);

    char str1[n];
    printf("Enter your name : ");
    scanf("%s",str1);

    char vowel[] = "aeiou";

    for(int i=0;i<strlen(str1);i++) {
        if (str1[i] != ' ') {
        str1[i] = tolower(str1[i]); }
    }

    int vowel_count = 0;
    int consonant_count = 0;
    int special_count = 0;
    int flag = 0;
    int special_flag=0;

    for(int i=0;i<strlen(str1);i++) {
        for(int j=0;j<strlen(vowel);j++) {
            if (str1[i] == vowel[j]) {
                flag = 1;
                }
```

```
37              else if (str1[i]=='b' || str1[i]=='h' || str1[i]=='s'
38                  special_flag = 1;
39                  }
40          }
41          if (flag==1) {
42              vowel_count = vowel_count + 1;      }
43          if(flag==0){
44              consonant_count = consonant_count + 1; }
45          if(special_flag==1) {
46              special_count = special_count + 1; }
47          special_flag = 0;
48          flag = 0;
49      }
50      printf("\nvowel_count : %d",vowel_count);
51      printf("\nconsonant_count : %d",consonant_count);
52      printf("\nSpecial characters count : %d",special_count);
53
54      return 0;
55  }
```

Output

```
Enter the length of your name : 9
Enter your name : Prashanth

vowel_count : 2
consonant_count : 7
Special characters count : 4

...Program finished with exit code 0
Press ENTER to exit console.
```

Program-code

```
/*Prashanth.S 19MID0020*/

#include<stdio.h>
#include<conio.h>

#include<ctype.h>
#include<string.h>

int main()
{
        int n;
        printf("Enter the length of your name : ");
        scanf("%d",&n);

        char str1[n];
        printf("Enter your name : ");
   scanf("%s",str1);

        char vowel[] = "aeiou";
```

```
        for(int i=0;i<strlen(str1);i++) {
                if (str1[i] != ' ') {
           str1[i] = tolower(str1[i]); }
        }

        int vowel_count = 0;
        int consonant_count = 0;
        int special_count = 0;
        int flag = 0;
        int special_flag=0;

  for(int i=0;i<strlen(str1);i++) {
    for(int j=0;j<strlen(vowel);j++) {
                        if (str1[i] == vowel[j]) {
                                flag = 1;
                           }
                        else if (str1[i]=='b' || str1[i]=='h' || str1[i]=='s' || str1[i]=='p') {
                                special_flag = 1;
          }
    }
    if (flag==1) {
       vowel_count = vowel_count + 1;     }
                if(flag==0){
                   consonant_count = consonant_count + 1; }
                if(special_flag==1) {
                   special_count = special_count + 1; }
    special_flag = 0;
                flag = 0;
        }
        printf("\nvowel_count : %d",vowel_count);
        printf("\nconsonant_count : %d",consonant_count);
        printf("\nSpecial characters count : %d",special_count);

        return 0;
}
```

Output

```
Enter the length of your name : 9
Enter your name : Prashanth

vowel_count : 2
consonant_count : 7
Special characters count : 4
```

5. Write a C program to perform ATM transaction. The transactions are Balance checking, Cash withdrawal and Cash deposition. Firstly initialize the ATM pin as your registration number. Take the ATM pin and the balance amount as input. If the input pin is equal to the initialized pin, then do the further operations or send an error message “Enter the correct PIN”. Use switch statement to do the operations like Balance checking (1), Cash withdrawal (2), Cash deposition (3) and Quit (4). Use while loop to terminate or restart the process. (3 marks)

Program-code

```c
/*Prashanth.S 19MID0020*/

#include<stdio.h>
#include<conio.h>
#include<string.h>

/* global variable declaration */
int balance_amount = 4000000;

void Balance_checking() {
    printf("Your balance amount : %d",balance_amount);
}

void Cash_withdrawl() {
    int amount_withdraw;
    printf("Enter the amount to be withdrawn : ");
    scanf("%d",&amount_withdraw);

    if (amount_withdraw <= balance_amount) {
        printf("Your amount is : %d",amount_withdraw);
        balance_amount = balance_amount - amount_withdraw;
    }
    else {
        printf("Your balance is not sufficient");
    }
}

void Cash_deposition() {
    int amount_deposit;
    printf("\nEnter the amount to be depositted : ");
    scanf("%d",&amount_deposit);
    printf("\nYour depositted amount is : %d",amount_deposit);
    balance_amount = balance_amount + amount_deposit;
    }

void Quit() {
```

```c
    printf("Thank You, visit again");
}

int main()
{
    char pin[] = {"19MID0020"};
    char user_pin [] = {};

    int flag = 0;
    int expression;

                        /* Taking input from the user */
    printf("Enter the PIN : ");
    scanf("%s",user_pin);

    int key = strcmp(pin,user_pin);
    if (key==0) {

        printf("Enter the balance_amount : ");
        scanf("%d",&balance_amount);

        printf("Option-1   : Balance_checking");
        printf("\nOption-2 : Cash_withdrawl");
        printf("\nOption-3 : Cash_deposition");
        printf("\nOption-4 : Quit");

        printf("\nEnter 0:Continue and -1:Quit : ");
        scanf("%d",&flag);

        while(flag==0) {
            printf("\nEnter your options : ");
            scanf("%d",&expression);

            switch (expression) {
                case 1:
                    Balance_checking();
                    break;
```

```
74                  case 2:
75                      Cash_withdrawl();
76                      break;
77                  case 3:
78                      Cash_deposition();
79                      break;
80                  case 4:
81                      Quit();
82                      break;
83                  default:
84                      printf("Your Service is expired");
85              }
86              printf("\nEnter 0:Continue and -1:Quit : ");
87              scanf("%d",&flag);
88          }
89      }
90
91      else {
92          printf("Your PIN is invalid");
93      }
94
95      return 0;
96  }
```

Output

```
Enter the PIN : 19MID0020
Enter the balance_amount : 500
Option-1   : Balance_checking
Option-2 : Cash_withdrawl
Option-3 : Cash_deposition
Option-4 : Quit
Enter 0:Continue and -1:Quit : 0

Enter your options : 1
Your balance amount : 500
Enter 0:Continue and -1:Quit : 0

Enter your options : 2
Enter the amount to be withdrawn : 30
Your amount is : 30
Enter 0:Continue and -1:Quit : 0

Enter your options : 1
Your balance amount : 470
Enter 0:Continue and -1:Quit : -1


...Program finished with exit code 0
Press ENTER to exit console.
```

Program-code

```
/*Prashanth.S 19MID0020*/

#include<stdio.h>
#include<conio.h>
#include<string.h>

/* global variable declaration */
int balance_amount = 4000000;

void Balance_checking() {
        printf("Your balance amount : %d",balance_amount);
}

void Cash_withdrawl() {
        int amount_withdraw;
        printf("Enter the amount to be withdrawn : ");
        scanf("%d",&amount_withdraw);

        if (amount_withdraw <= balance_amount) {
                printf("Your amount is : %d",amount_withdraw);
                balance_amount = balance_amount - amount_withdraw;
        }
        else {
                printf("Your balance is not sufficient");
        }
}

void Cash_deposition() {
        int amount_deposit;
        printf("\nEnter the amount to be depositted : ");
        scanf("%d",&amount_deposit);
        printf("\nYour depositted amount is : %d",amount_deposit);
        balance_amount = balance_amount + amount_deposit;
        }

void Quit() {
        printf("Thank You, visit again");
}

int main()
{
        char pin[] = {"19MID0020"};
        char user_pin [] = {};

        int flag = 0;
```

```
int expression;
                /* Taking input from the user */
printf("Enter the PIN : ");
scanf("%s",user_pin);

int key = strcmp(pin,user_pin);
if (key==0)      {

        printf("Enter the balance_amount : ");
        scanf("%d",&balance_amount);

        printf("Option-1   : Balance_checking");
        printf("\nOption-2 : Cash_withdrawl");
        printf("\nOption-3 : Cash_deposition");
        printf("\nOption-4 : Quit");

        printf("\nEnter 0:Continue and -1:Quit : ");
        scanf("%d",&flag);

        while(flag==0) {
           printf("\nEnter your options : ");
           scanf("%d",&expression);

                switch (expression) {
                        case 1:
                                Balance_checking();
                                break;
                        case 2:
                                Cash_withdrawl();
                                break;
                        case 3:
                                Cash_deposition();
                                break;
                        case 4:
                                Quit();
                                break;
                        default:
                                printf("Your Service is expired");
                }
                printf("\nEnter 0:Continue and -1:Quit : ");
                scanf("%d",&flag);
        }
}

else {
        printf("Your PIN is invalid");
}       return 0; }
```

Output

Enter the PIN : 19MID0020
Enter the balance_amount : 500
Option-1 : Balance_checking
Option-2 : Cash_withdrawl
Option-3 : Cash_deposition
Option-4 : Quit
Enter 0:Continue and -1:Quit : 0

Enter your options : 1
Your balance amount : 500
Enter 0:Continue and -1:Quit : 0

Enter your options : 2
Enter the amount to be withdrawn : 30
Your amount is : 30
Enter 0:Continue and -1:Quit : 0

Enter your options : 1
Your balance amount : 470
Enter 0:Continue and -1:Quit : -1

6. Tell me about a time when you came up with a new approach to the above problems. (1 mark to show up your individuality, answer should be sound and sensible – Answers repeated no marks, so don't share your answers)

In the vowel and consonant program, I took each and every character in my name and cross verified with vowels(in a separate array) and special characters(individual elements), and then classified into vowel_count and special_character count.
Rest of the words belong to consonants.
In ATM bank problem, I asked the input from the user while he was depositing the withdrawing money apart from PIN and balance_amount.