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COURSE CODE: - 1CS501

SUBJECT: - COMPUTER PROGRAMMING

PRACTICAL NO 4: C programs to demonstrate use of loop constructs

a)

To s following patterns:

A	1	1
A B	01	1 2 1
A B C	101	1 2 3 2 1
A B C D	0101	1 23432 1

Code :

```
#include <stdio.h>

int main() {

    for (int i = 0; i < 4; i++) {

        char a = 'A';

        for (int j = 0; j <= i; j++) {

            printf("%c", a);

            a++;

        }

        printf("\n");

    }

    printf("\n");

    for (int i = 0; i < 4; i++) {

        int sum;

        for (int j = 0; j <= i; j++) {

            sum = i + j;

            if (sum % 2 == 0) {

                printf("1");

            } else {

                printf("0");

            }

        }

        printf("\n");

    }

}
```

```

printf("\n");

for (int i = 1; i < 5; i++) {
    int n = 5;
    for (int k = 1; k < n - i; k++) {
        printf(" ");
    }
    for (int j = 1; j <= i; j++) {
        printf("%d", j);
    }
    for (int l = i - 1; l > 0; l--) {
        printf("%d", l);
    }
    printf("\n");
}

return 0;
}

```

Output:

```

C:\Users\JaySs\OneDrive\De:
A
AB
ABC
ABCD

1
01
101
0101

    1
   121
  12321
 1234321

Process returned 0 (0x0)   execution time : 0.040 s
Press any key to continue.

```

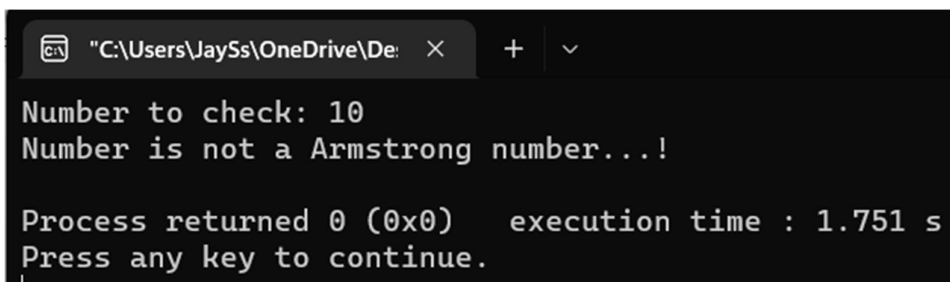
b) To determine whether the input number is an Armstrong number

Code:

```
#include<stdio.h>

int main()
{
    int num1,num2=0,num3,num4;
    printf("Number to check: ");
    scanf("%d",&num1);
    num3=num1;
    while(num1>0)
    {
        num4=num1%10;
        num2+=(num4*num4*num4);
        num1=num1/10;
    }
    if(num3==num2)
    {
        printf("Number is Armstrong number...\n");
    }
    else
    {
        printf("Number is not a Armstrong number...\n ");
    }
    return 0;
}
```

Output:



```
"C:\Users\JaySs\OneDrive\De" × + ∨
Number to check: 10
Number is not a Armstrong number...!

Process returned 0 (0x0)   execution time : 1.751 s
Press any key to continue.
```

```
"C:\Users\JaySs\OneDrive\De:  X + v
Number to check: 153
Number is Armstrong number...!

Process returned 0 (0x0)   execution time : 2.230 s
Press any key to continue.
```

c) To determine whether the entered number is Prime

Code:

```
#include <stdio.h>

int main() {
    int number_to_ck, num2, temp_num = 0;

    printf("Number to check: ");
    scanf("%d", &number_to_ck);
    num2 = number_to_ck / 2;

    for (int i = 2; i <= num2; i++) {
        if (number_to_ck % i == 0) {
            printf("Not a prime number.");
            temp_num = 1;
            break;
        }
    }

    if (temp_num == 0) {
        printf("Number is prime.");
    }

    return 0;
}
```

Output:

```
"C:\Users\JaySs\OneDrive\De:  X + v
Number to check: 10
Not a prime number.
Process returned 0 (0x0)   execution time : 2.060 s
Press any key to continue.
```

d) To determine whether the entered number is Palindrome.

Code:

```
#include <stdio.h>

int main() {
    int number, rem, original_number, reverse = 0;
    printf("Enter the number: ");
    scanf("%d", &number);
    original_number = number;
    while (number != 0) {
        rem = number % 10;
        reverse = reverse * 10 + rem;
        number /= 10;
    }
    printf("The reversed number is %d\n", reverse);
    if (original_number == reverse) {
        printf("The number is a Palindrome.");
    } else {
        printf("The number is not a Palindrome.");
    }
    return 0;
}
```

Output:

```
"C:\Users\JaySs\OneDrive\De:  ×  +  ∨  
Enter the number: 102  
The reversed number is 201  
The number is not a Palindrome.  
Process returned 0 (0x0)   execution time : 1.586 s  
Press any key to continue.
```

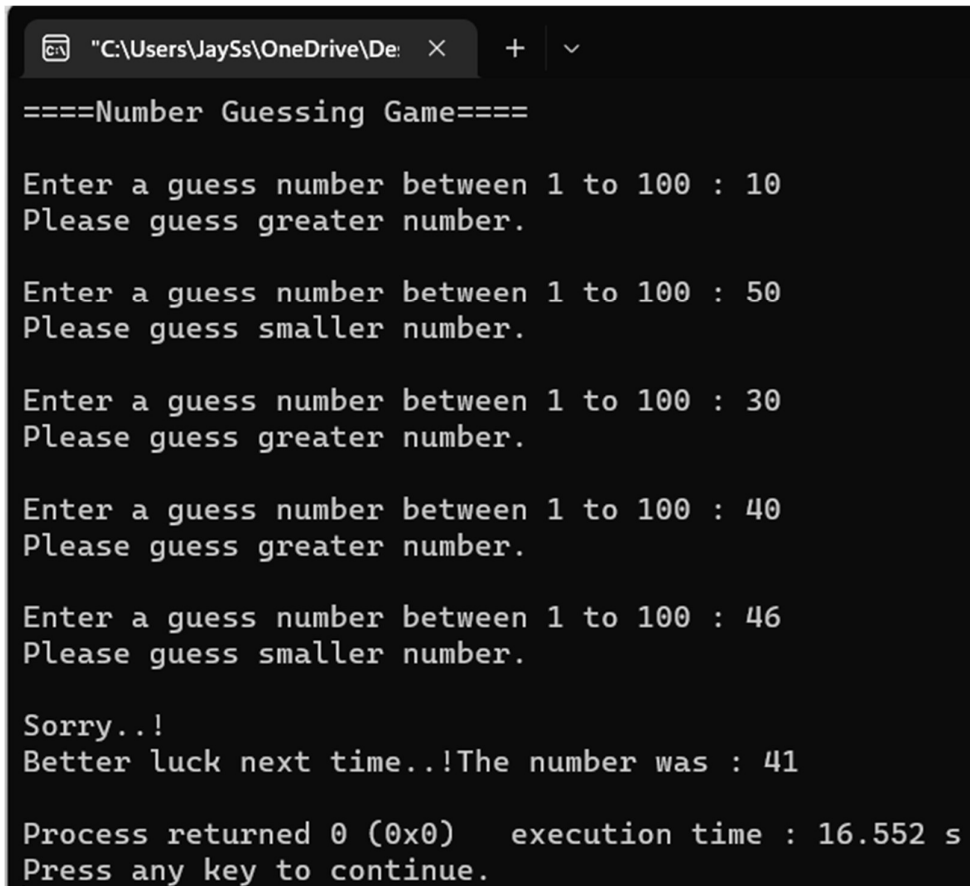
- e) Enhance the number guessing game developed earlier. The program should now display more appropriate message (Greater, Smaller or Correct). It should allow maximum 5 attempts from the user and still if the user cannot guess the number correctly, it should display "Sorry".

Code:

```
#include <math.h>  
  
#include <stdio.h>  
  
int main() {  
    int guess, tries = 0;  
    srand(time(NULL));  
    int num = rand() % 100;  
    printf("====Number Guessing Game====\n\n");  
  
    for (int i = 1; i <= 5; i++) {  
        printf("Enter a guess number between 1 to 100 : ");  
        scanf("%d", &guess);  
        tries++;  
  
        if (guess > num) {  
            printf("Please guess smaller number.\n\n");  
        } else if (guess < num) {  
            printf("Please guess greater number.\n\n");  
        } else {  
            printf("\nCongratulations!\nYou got it in %d guesses,\n", tries);  
        }  
    }  
  
    if (guess != num) {  
        printf("Sorry..!\nBetter luck next time..!");  
        printf("The number was : %d\n", num);  
    }  
}
```

```
}  
  
return 0;  
  
}
```

Output:



```
"C:\Users\JaySs\OneDrive\De:  X  +  v  
====Number Guessing Game====  
  
Enter a guess number between 1 to 100 : 10  
Please guess greater number.  
  
Enter a guess number between 1 to 100 : 50  
Please guess smaller number.  
  
Enter a guess number between 1 to 100 : 30  
Please guess greater number.  
  
Enter a guess number between 1 to 100 : 40  
Please guess greater number.  
  
Enter a guess number between 1 to 100 : 46  
Please guess smaller number.  
  
Sorry..!  
Better luck next time..!The number was : 41  
  
Process returned 0 (0x0)   execution time : 16.552 s  
Press any key to continue.
```