

Name – Akshat Jaiswal

Roll No. – 21052646

Section – CSE 37

DSA LAB 1

1. WAP to test whether a number num (num is entered through keyboard) is a prime number or not.

Input:

```
C prime.c > main(void)
1  #include <stdio.h>
2  int main (void)
3  {
4      int num,i,count=0;
5      printf("Enter a number: ");
6      scanf("%d",&num);
7      for(i=1;i<=num;i++)
8      {
9          if (num == 1 || num == 0)
10             goto special;
11             if(num%i==0)
12                 count++;
13     }
14     if (count==2)
15         printf("Number %d is a prime number!",num);
16     else
17         printf("Number %d is not a prime number!",num);
18
19     return 0;
20
21     special:
22     printf("\nSpecial Case!\n");
23 }
```

Output:

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.795]
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C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\prime.exe
Enter a number: 7
Number 7 is a prime number
C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\prime.exe
Enter a number: 1

Special Case

C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\prime.exe
Enter a number: 2
Number 2 is a prime number
C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\prime.exe
Enter a number: 4
Number 4 is not a prime number
C:\Users\KIIT\Desktop\DSA Classes\LAB 1>
```

2. WAP to calculate x^y using function.

Input:

```
1  #include <stdio.h>
2  #include <math.h>
3  int main (void)
4  {
5      int x,y,c;
6      printf("Enter the value of x: ");
7      scanf("%d",&x);
8      fflush(stdin);
9      printf("Enter the value of y: ");
10     scanf("%d",&y);
11     c = power(x,y);
12     printf("Result: %d",c);
13     return 0;
14 }
15 int power(int x,int y)
16 {
17     int result=1;
18     while(y!=0)
19     {
20         result =result*x;
21         y--;
22     }
23     return result;
24 }
```

Output:

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.795]
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C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\power.exe
Enter the value of x: 7
Enter the value of y: 2
Result: 49
C:\Users\KIIT\Desktop\DSA Classes\LAB 1>
```

3. WAP to find the LCM of two numbers a and b by using a suitable function (say LCM) for this.

Input:

```
C LCM_c > main(void)
1  #include <stdio.h>
2  int main (void)
3  {
4      int x,y,a,b;
5      printf("Enter two numbers : ");
6      scanf("%d%d",&x,&y);
7      a=x;b=y;
8      while (a!=b)
9      {
10         if (a<b)
11             a=a+x;
12         else
13             b=b+y;
14     }
15     printf("LCM of %d and %d => %d\n",x,y,a);
16 }
```

Output:

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.795]
(c) Microsoft Corporation. All rights reserved.

C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\LCM_.exe
Enter two numbers : 5
4
LCM of 5 and 4 => 20

C:\Users\KIIT\Desktop\DSA Classes\LAB 1>_
```

4. WAP to perform the add, sub, mul, & div operations based on functions.

Input:

```
arithmetics.c > main(void)
1  #include <stdio.h>
2
3  int add();
4  int sub();
5  int mul();
6  int div();
7  int main (void)
8  {
9      int a,b;
10     printf("Enter the value of a: ");
11     scanf ("%d",&a);
12     fflush(stdin);
13     printf("Enter the value of b: ");
14     scanf ("%d",&b);
15     int p=add(a,b);
16     printf("Addition : %d\n",p);
17     int q=sub(a,b);
18     printf("Subtraction : %d\n",q);
19     int s=mul(a,b);
20     printf("Multiplication : %d\n",s);
21     int t=div(a,b);
22     printf("Division : %d\n",t);
23     return 0;
24 }
```

```

21     int t=div(a,b);
22     printf("Division : %d\n",t);
23     return 0;
24 }
25 int add(int x,int y)
26 {
27     int result = x+y;
28     return result;
29 }
30 int sub(int x,int y)
31 {
32     int result = x-y;
33     return result;
34 }
35 int mul(int x,int y)
36 {
37     int result = x*y;
38     return result;
39 }
40 int div(int x,int y)
41 {
42     int result = x/y;
43     return result;
44 }

```

Output:

```

C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.795]
(c) Microsoft Corporation. All rights reserved.

C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\arithmetics.exe
Enter the first number: 7
Enter the second number: 3
Addition : 10
Subtraction : 4
Multiplication : 21
Division : 2

C:\Users\KIIT\Desktop\DSA Classes\LAB 1>

```

5. WAP to create, initialize, assign and access a pointer variable.

Input:

```
C pointer.c > main(void)
1  #include <stdio.h>
2  int main (void)
3  {
4      int i;
5      int *j;
6      printf("Enter the value of i: ");
7      scanf("%d",&i);
8      j=&i;
9      printf("The value of i is %d",i);
10     printf("The address of i is %u",j);
11     return 0;
12 }
```

Output:

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.795]
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C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\pointer.exe
Enter the value of i: 5
The value of i is 5
The address of i is 2965371540

C:\Users\KIIT\Desktop\DSA Classes\LAB 1>
```


6. WAP to add two numbers using pointers.

Input:

```
1  #include <stdio.h>
2  int main (void)
3  {
4      int a,b,c;
5      int *x=&a,*y=&b;
6      printf("Enter the value of a: ");
7      scanf("%d",&a);
8      fflush(stdin);
9      printf("Enter the value of b: ");
10     scanf("%d",&b);
11     c=*x+*y;
12     printf("The addition: %d",c);
13     return 0;
14 }
```

Output:

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.795]
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C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\add_pointer.exe
Enter the value of a: 6
Enter the value of b: 4
The addition: 10
C:\Users\KIIT\Desktop\DSA Classes\LAB 1>_
```

7. WAP to swap two numbers using call by reference.

Input:

```
1  #include <stdio.h>
2  swap();
3  int main (void){
4      int a,b,c;
5      printf("Enter the value of a: ");
6      scanf("%d",&a);
7      fflush(stdin);
8      printf("Enter the value of b: ");
9      scanf("%d",&b);
10     printf("The value of a & b = %d & %d \n",a,b);
11     swap(&a,&b);
12     printf("\nAfter Swapping\n");
13     printf("The value of a & b = %d & %d \n",a,b);
14     return 0;
15 }
16 swap (int *x,int *y)
17 {
18     int temp = *x;
19     *x = *y;
20     *y = temp;
21 }
```

Output:

```
C:\Windows\System32\cmd.exe
Microsoft Windows [Version 10.0.22000.795]
(c) Microsoft Corporation. All rights reserved.

C:\Users\KIIT\Desktop\DSA Classes\LAB 1>.\swap.exe
Enter the value of a: 7
Enter the value of b: 9
The value of a & b = 7 & 9

After Swapping
The value of a & b = 9 & 7

C:\Users\KIIT\Desktop\DSA Classes\LAB 1>_
```