কম্পিউটার প্রোগ্রামিং

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Page – 85(5.9)

```c
//Determine gcd and lcm.
#include <stdio.h>

int main()
{
    int num1, num2, n1, n2, rem, lcm, gcd;

    printf("Please enter two number = ");
    scanf("%d %d", &num1, &num2);

    n1 = num1;
    n2 = num2;

    while (n2 != 0)
    {
        rem = n1 % n2;
        n1 = n2;
        n2 = rem;
    }
    gcd = n1;
    lcm = (num1 * num2) / gcd;

    printf("GCD = %d\n", gcd);
    printf("LCM = %d\n", lcm);

    return 0;
}
```

Page – 82(5.7)

```c
//Celsius to Farenheit.
#include <stdio.h>

int main()
{
     double f, c;
     printf("Enter celsius temperature = ");
     scanf("%lf", &c);

     f = (c * 1.8) + 32;

     printf("The farenheit temperature is = %.2lf\n", f);

     return 0;
}
```

```c
//Farenheit to Celcius.
#include <stdio.h>

int main()
{
     double f, c;
     printf("Enter farenheit temperature = ");
     scanf("%lf", &f);

     c = (f - 32) / 1.8;

     printf("The celcius temperature is = %.2lf\n", c);

     return 0;
}
```

Page – 81(5.6)

```c
//1+2+3+--------+n.
#include <stdio.h>

int main()
{
     int n, sum = 0, i;
     printf("Enter the last value of the series = ");
     scanf("%d", &n);

     for (i = 1; i <= n; i++)
     {
          sum = sum + i;
     }
     printf("Summation is = %d\n", sum);

     return 0;
}
```

```c
//1+3+5+--------+n.
#include <stdio.h>

int main()
{
     int n, sum = 0, i;
     printf("Enter the last value of the series = ");
     scanf("%d", &n);

     for (i = 1; i <= n; i = i+2)
     {
          sum = sum + i;
     }
     printf("Summation is = %d\n", sum);

     return 0;
}
```

Page – 80(4)

```c
#include <stdio.h>

int main()
{
	int t, v;
	printf("Enter the value of t and v = ");
	scanf("%d %d", &t, &v);

	printf("The distance after 2t second is = %d\n", 2 * t * v);

	return 0;
}
```

Page – 79(5.4)

```c
#include <stdio.h>

int main()
{
     double loanamount, interestrate, years, totalamount,
monthlyamount;

     printf("Enter the loan amount = ");
     scanf("%lf", &loanamount);
     printf("Enter the interest rate = ");
     scanf("%lf", &interestrate);
     printf("Enter total years = ");
     scanf("%lf", &years);

     totalamount = loanamount + loanamount * interestrate / 100;
     monthlyamount = totalamount / (years * 12);

     printf("Total amount = %.2lf\n", totalamount);
     printf("Monthly amount = %.2lf\n", monthlyamount);

     return 0;
}
```

Page – 77(5.2)

```c
#include <stdio.h>

int main()
{
    double a1, a2, b1, b2, c1, c2, x, y;
    printf("Enter a1 = ");
    scanf("%d", &a1);
    printf("Enter a2 = ");
    scanf("%d", &a2);
    printf("Enter b1 = ");
    scanf("%d", &b1);
    printf("Enter b2 = ");
    scanf("%d", &b2);
    printf("Enter c1 = ");
    scanf("%d", &c1);
    printf("Enter c2 = ");
    scanf("%d", &c2);

    x = (b2 * c1 - b1 * c2) / (a1 * b2 - a2 * b1);
    y = (a1 * c2 - a2 * c1) / (a1 * b2 - a2 * b1);

    printf("X = %.2lf\n", x);
    printf("Y = %.2lf\n", y);

    return 0;
}
```

Page – 78(5.3)

```c
#include <stdio.h>

int main()
{
     double a1, a2, b1, b2, c1, c2, x, y, d;
     printf("Enter a1 = ");
     scanf("%d", &a1);
     printf("Enter a2 = ");
     scanf("%d", &a2);
     printf("Enter b1 = ");
     scanf("%d", &b1);
     printf("Enter b2 = ");
     scanf("%d", &b2);
     printf("Enter c1 = ");
     scanf("%d", &c1);
     printf("Enter c2 = ");
     scanf("%d", &c2);

     d = (a1 * b2 - a2 * b1);

     if ((int)d == 0)
     {
          printf("Value of x and y cannot be determined\n");
     }
     else
     {
          x = (b2 * c1 - b1 * c2) / d;
          y = (a1 * c2 - a2 * c1) / d;
     }

     printf("X = %.2lf\n", x);
     printf("Y = %.2lf\n", y);

     return 0;
}
```

Page – 76(5.1)

```c
#include <stdio.h>

int main()
{
    double x, y, xplusy, xminusy;

    printf("Enter the value of x + y = ");
    scanf("%lf", &xplusy);
    printf("Enter the value of x - y = ");
    scanf("%lf", &xminusy);

    x = (xplusy + xminusy) / 2;
    y = (xplusy - xminusy) / 2;

    printf("x = %.2lf\n", x);
    printf("y = %.2lf\n", y);

    return 0;
}
```

Page – 115(8.1)

```c
#include <stdio.h>

int main()
{
	int num[] = { 1,4,6,8,9,11,14,15,20,25,33,83,87,97,99,100 };
	int value = 97;
	int lowindex = 0;
	int highindex = 15;
	int midindex;

	while (lowindex <= highindex)
	{
		midindex = (lowindex + highindex) / 2;
		if (value == num[midindex])
		{
			break;
		}
		else if (value > num[midindex])
		{
			lowindex = midindex + 1;
		}
		else
		{
			highindex = midindex - 1;
		}
	}
	if (lowindex > highindex)
	{
		printf("%d is not in the number\n", value);
	}
	else
	{
		printf("%d is found in the number.
It is the %dth element of the number\n", value, midindex);
	}

	return 0;
}
```

Page – 116(Linear search)

```c
#include <stdio.h>

int main()
{
    int num[] = { 4, 5, 6, 8, 9, 11, 12 };
    int value, position = 0, i;
    printf("Enter the value you want to search = ");
    scanf("%d", &value);

    for (i = 0; i < 7; i++)
    {
        if (value == num[i])
        {
            position = position + i;
            break;
        }
    }
    if (position == -1)
    {
        printf("Value is not found\n");
    }
    else
    {
        printf("Value is found at position %d", position);
    }

    return 0;
}

//position = -1
//position = i + 1 (এভাবে করলেও হবে)
```

Page – 120(9.4)

```c
//Lower to Upper.
*#include <stdio.h>

int main()
{
     char country[] = "Bangladesh";
     int i, length = 10;

     printf("%s\n", country);

     for (i = 0; i < 10; i++)
     {
          if (country[i] >= 'a' && country[i] <= 'z')
          {
               country[i] = 'A' + (country[i] - 'a');
          }
     }
     printf("%s\n", country);

     return 0;
}
```

Page – 120(9.4)

```c
//Upper to Lower
#include <stdio.h>

int main()
{
     char country[] = "Bangladesh";
     int i, length = 10;

     printf("%s\n", country);

     for (i = 0; i < 10; i++)
     {
          if (country[i] >= 'A' && country[i] <= 'Z')
          {
               country[i] = 'a' + (country[i] - 'A');
          }
     }
     printf("%s\n", country);

     return 0;
}
```

Page – 124(9.7)

```c
#include <stdio.h>

int main()
{
	char s1[] = "Bangla", s2[] = "desh", s3[12];
	int i, j, length1 = 6, length2 = 4;
	//i for s1 and j for s3.

	for (i = 0, j = 0; i < length1; i++, j++)
	{
		s3[j] = s1[i];
	}
	for (i = 0; i < length2; i++, j++)
	{
		s3[j] = s2[i];
		//s3 er soptom upadan hoby s2 er protom upadan.
	}
	s3[j] = '\0';
	printf("%s\n", s3);

	return 0;
}
```

Page – 131(9.9)

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

int main()
{
	char s[100], ch;
	int i, length, wordstarted = 0;

	gets(s);
	length = strlen(s);

	for (i = 0; i < length; i++)
	{
		if (s[i] >= 'a' && s[i] <= 'z')
		{
			if (wordstarted == 0)
			{
				wordstarted = 1;
				ch = 'A' + s[i] - 'a';
			}
			else
			{
				printf("%c", s[i]);
			}
		}
		else if ((s[i] >= 'A' && s[i] <= 'Z') || (s[i] >= '0' && s[i] <= '9'))
		{
			if (wordstarted == 0)
			{
				wordstarted = 1;
			}
			printf("%c", s[i]);
		}
		else
		{
			if (wordstarted == 1)
			{
				wordstarted = 0;
				printf("\n");
			}
		}
	}

	return 0;
}
```

Page – 132(10.1)

```c
#include <stdio.h>

int main()
{
    int num, i, count = 0;

    printf("Please enter a number = ");
    scanf("%d", &num);

    for (i = 2; i < num; i++)
    {
        if (num % 2 == 0)
        {
            count++;
            break;
        }
    }

    if (count == 0)
    {
        printf("This is a prime number\n");
    }
    else
    {
        printf("This is not a prime number\n");
    }

    return 0;
}
```

Page – 154(12.1) (বাইনারি → ডেসিমাল)

```c
//Binary to Decimal.
#include <stdio.h>
#include <string.h>
#include <math.h>

int main()
{
     char binary[65];
     int length;
     int position;
     int decimal = 0;
     int i;

     printf("Enter the binary number = ");
     scanf("%s", &binary);

     length = strlen(binary);
     position = length - 1;

     for (i = 0; i < length; i++)
     {
          decimal = decimal + (binary[i] - '0') * pow(2, position);
          position--;
     }

     printf("Decimal value is = %d\n", decimal);

     return 0;
}
```

Page – 155 (ডেসিমাল → বাইনারি)

```c
//Decimal to Binary.
#include <stdio.h>

int main()
{
    int decimalnumber;
    int binarynumber = 0;
    int rem, temp = 1;

    printf("Enter a Decimal Number: ");
    scanf("%d", &decimalnumber);

    while (decimalnumber != 0)
    {
        rem = decimalnumber % 2;
        decimalnumber = decimalnumber / 2;
        binarynumber = binarynumber + rem * temp;
        temp = temp * 10;
    }

    printf("The Binary Number is: %d", binarynumber);

    return 0;
}
```

Page – 159(Factorial)

```c
#include <stdio.h>

int main()
{
     int num, i, factorial = 1;
     printf("Enter any positive number = ");
     scanf("%d", &num);

     for (i = 1; i <= num; i++)
     {
          factorial = factorial * i;
     }
     printf("The factorial of %d is = %d\n", num, factorial);

     return 0;
}
```

Page – 160(Palindrome number/প্যালিনড্রোম নাম্বার).

```c
#include <stdio.h>

int main()
{
    int num, rem, temp, sum = 0;
    printf("Enter any number = ");
    scanf("%d", &num);

    temp = num;

    while (temp != 0)
    {
        rem = temp % 10;
        temp = temp / 10;
        sum = sum * 10 + rem;
    }
    if (sum == num)
    {
        printf("This is a palindrome number\n");
    }
    else
    {
        printf("This is not a palindrome number\n");
    }
    return 0;
}
```

Page – 163(Ascending and Descending order)

```c
#include <stdio.h>

int main()
{
	int num1[] = { 5, 7, 3, 2, 9 };
	int num2[5];
	int i, j, minimum, miniposition;
	//i for num1 and j for num2.

	for (j = 0; j < 5; j++)
	{
		minimum = 1000;
		for (i = 0; i < 5; i++)
		{
			if (minimum > num1[i])
			{
				minimum = num1[i];
				miniposition = i;
			}
		}
		num1[miniposition] = 1000;
		num2[j] = minimum;
	}

	printf("Asecnding order\n");
	for (i = 0; i < 5; i++)
	{
		printf("%d\n", num2[i]);
	}

	printf("\n");

	printf("Descending order\n");
	for (i = 4; i >= 0; i--)
	{
		printf("%d\n", num2[i]);
	}

	return 0;
}
```

Page – 163(Ascending and Descending order from the user)

```c
#include <stdio.h>

int main()
{
    int num1[5];
    int num2[5];
    int i, j, minimum, miniposition, n;
    //i for num1 and j for num2.
    printf("Enter how many numbers = ");
    scanf("%d", &n);
    for (i = 0; i < n; i++)
    {
        scanf("%d", &num1[i]);
    }

    for (j = 0; j < n; j++)
    {
        minimum = 1000;
        for (i = 0; i < n; i++)
        {
            if (minimum > num1[i])
            {
                minimum = num1[i];
                miniposition = i;
            }
        }
        num1[miniposition] = 1000;
        num2[j] = minimum;
    }
```

```
    printf("Asecnding order\n");
    for (i = 0; i < n; i++)
    {
        printf("%d\n", num2[i]);
    }

    printf("\n");

    printf("Descending order\n");
    for (i = n - 1; i >= 0; i--)
    {
        printf("%d\n", num2[i]);
    }

    return 0;
}
```

Page – 166(13.4) (Grid Traversal – গ্রিড ট্রাভার্সাল বা রোবটের ভ্রমণ)

```c
#include <stdio.h>

int main()
{
	int x, y;
	char ch;

	printf("Please enter the enitial position = ");
	scanf("%d %d", &x, &y);

	while (1)
	{
		scanf("%c", &ch);
		if (ch == 's')
		{
			break;
		}
		else if (ch == 'u')
		{
			x--;
		}
		else if (ch == 'd')
		{
			x++;
		}
		else if (ch == 'r')
		{
			y++;
		}
		else if (ch == 'l')
		{
			y--;
		}
	}
	printf("Final position of the robot is = %d, %d\n", x, y);

	return 0;
}
```

Page – 169(13.6)

```c
#include <stdio.h>

int main()
{
    char ch1 = 67, ch2 = 69, ch3 = 99;
    printf("%c %c %c\n", ch1, ch2, ch3);

    return 0;
}
```

Page – 170(13.7)

C program to encrypt and decrypt a string (এনক্রিপশন এন্ড ডিক্রিপশন)

```c
#include <stdio.h>

int main()
{
    int i, x, n;
    char str[100];

    printf("\nPlease enter a string:\n");
    gets(str);
    n = strlen(str);

    printf("\nPlease choose following options:\n");
    printf("1 = Encrypt the string.\n");
    printf("2 = Decrypt the string.\n");
    scanf("%d", &x);

    if (x == 1)
    {
        for (i = 0; i < n; i++)
        {
            str[i] = str[i] + 1;
            //the key for encryption is 1 that is
added to ASCII value
        }
        printf("\nEncrypted string: %s\n", str);
    }

    else if (x == 2)
    {
        for (i = 0; i < n; i++)
        {
            str[i] = str[i] - 1;
```

```
            //the key for encryption is 1 that is
subtracted to ASCII value
        }
        printf("\nDecrypted string: %s\n", str);
    }

    else
    {
        printf("\nError\n");
    }

    return 0;
}
```