DD Samarasinha – 24912

Practical 5

1.

```
int main()
{
    int num=0;

    //while loop
    while (num<=100)
    {
        printf("%d\n", num);
        num++;
    }

    //do while loop
    num = 0;
    do
    {
        printf("%d\n", num);
        num++;
    }while (num<=100);

    //for loop
    for (num=0; num<=100; num++)
    {
        printf("%d\n", num);
    }

    return 0;
}
```

2.

```c
int main()
{
    int count, marks;
    float tot = 0, avg;

    for (count = 1; count <= 10; ++count)
    {
        printf("Enter marks: ");
        scanf("%d", &marks);

        tot += marks;
        avg = tot / count;
    }

    if (avg < 50)
    {
        printf("Fail!");
    }
    else
    {
        printf("Pass!");
    }

    return 0;
}
```

3.

```c
int main()
{
    int inp, fac=1, num;

    printf("Enter number: ");
    scanf("%d", &inp);

    for (num=1;num<=inp; num++)
    {
        fac *= num;
    }

    printf("Factorial of %d is %d", inp, fac);

    return 0;
}
```

4.

```c
int main()
{
    int num, dig, tot = 0;

    printf("Enter number: ");
    scanf("%d", &num);

    while (num>0)
    {
        dig = num%10;
        printf("(%d)\n", dig);
        tot += dig;
        num /= 10;
        printf("%d\n", num);
    }

    printf("The sum of all digits is %d", tot);
    return 0;
}
```

5.

```c
int main()
{
    int num, sum=0;

    printf("Enter numbers to add (enter -1 to stop):\n");

    while(num!=-1)
    {
        scanf("%d", &num);

        sum+=num;
    }

    sum+=1;

    printf("Sum: %d\n", sum);

    return 0;
}
```

6.

```c
int main()
{
    int base, exp, count, ans=1;

    printf("Enter base: ");
    scanf("%d", &base);
    printf("Enter exponent: ");
    scanf("%d", &exp);

    for(count=1;count<=exp;count++)
    {
        ans *= base;
    }

    printf("%d to the power of %d is %d", base, exp, ans);

    return 0;
}
```

7.

```c
int main()
{
    int numTerms=10,first=0, second=1,count=0;

    printf("Fibonacci Sequence: ");

    while (count < numTerms)
    {
        printf("%d ", first);
        int next = first + second;
        first = second;
        second = next;
        count++;
    }

    return 0;
}
```

8.

```c
int main()
{
    int inp,rem,sum=0,temp;

    printf("Enter number: ");
    scanf("%d",&inp);

    temp=inp;

    while(temp>0)
    {
        rem=temp%10;
        sum=sum+(rem*rem*rem);
        temp=temp/10;
    }

    if(inp==sum)
        printf("Armstrong  Number ");
    else
        printf("Not an Armstrong Number");

    return 0;
}
```

9.

```c
int main()
{
    char let='A';

    do
    {
        int ascii=let;
        printf("%c: %d\n", let, ascii);

        let++;
    } while (let<='Z');

    return 0;
}
```

10.

```c
int main()
{
    int x,y;

    for (x=1;x<=5;++x)
    {
        for (y=1;y<=x;++y)
        {
            printf("*");
        }
        printf("\n");
    }

    return 0;
}
```

11.

```c
int main()
{
    int num, i, prime = 1;

    printf("Enter number: ");
    scanf("%d", &num);

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

    if(prime)
    {
        printf("%d is a prime number\n", num);
    }
    else
    {
        printf("%d is not a prime number\n", num);
    }

    return 0;
}
```

12.

```c
int main()
{
    int num, i;

    printf("Enter number: ");
    scanf("%d", &num);

    printf("Factors: ", num);

    for (i=1;i<=num;i++)
    {
        if (num%i==0)
        {
            printf("%d ", i);
        }
    }

    printf("\n");

    return 0;
}
```

13.

```c
int main()
{
    int num, sum=0;

    printf("Enter numbers to add (enter -1 to stop):\n");

    while(num!=-1)
    {
        scanf("%d", &num);

        sum+=num;
    }

    sum+=1;

    printf("Sum: %d\n", sum);

    return 0;
```

14.

```c
int main()
{
    int arr[10];
    int i;

    for(i=0;i<10;++i)
    {
        printf("Enter number %d: ", i+1);
        scanf("%d", &arr[i]);
    }

    printf("[");

    for(i=0;i<9;++i)
    {
        printf("%d, ", arr[i]);
    }

    printf("%d]", arr[9]);

    return 0;
}
```

15.

```c
int main()
{
    int arr[10], i, even=0;

    for(i=0;i<10;++i)
    {
        printf("Enter number %d: ", i+1);
        scanf("%d", &arr[i]);

        if(arr[i]%2==0)
        {
            even++;
        }
    }

    printf("Count of even numbers in array: %d\n", even);

    return 0;
}
```

Part B

1.

```c
int main()
{
    int num, count, p=0, n=0, z=0;

    for (count=0;count<10;++count)
    {
        printf("Enter number %d: ", count+1);
        scanf("%d", &num);

        if(num>0)
        {
            p++;
        }
        else if(num<0)
        {
            n++;
        }
        else
        {
            z++;
        }
    }

    printf("Positive: %d\n", p);
    printf("Negative: %d\n", n);
    printf("Zeros: %d\n", z);

    return 0;
}
```

2.

```c
int main()
{
    int marks, i, max, min, sum=0;
    float avg;

    for(i=0;i<10;++i)
    {
        printf("Enter marks for student %d: ", i+1);
        scanf("%d", &marks);

        sum+=marks;

        if(i==0)
        {
            max=marks;
            min=marks;
        }
        else
        {
            if(marks>max)
            {
                max=marks;
            }

            if(marks<min)
            {
                min=marks;
            }
        }
    }

    avg=(float)sum/10;

    printf("Maximum marks: %d\n", max);
    printf("Minimum marks: %d\n", min);
    printf("Average marks: %.2f\n", avg);

    return 0;
}
```

3.

```c
int main()
{
    int price, great=0, sum=0, count=1;
    double avg;

    while (count <= 10)
    {
        printf("Enter price of item %d: ", count);
        scanf("%d", &price);

        if(price>200)
        {
            ++great;
        }

        sum+=price;

        ++count;
    }

    avg =(double)sum/10;

    printf("Items greater than 200: %d\n", great);
    printf("Average value: %.2lf\n", avg);

    return 0;
}
```

4.

```c
int main()
{
    int empNo=0, basicS, count=0;

    while(empNo!=-999)
    {
        printf("Enter employee number (-999 to stop): ");
        scanf("%d", &empNo);

        if(empNo!=-999)
        {
            printf("Enter basic salary: ");
            scanf("%d", &basicS);

            if(basicS>=5000)
            {
                ++count;
            }
        }
    }

    printf("Employees with basic salary >= 5000: %d\n", count);

    return 0;
}
```

5.

```c
int main()
{
    int empNo=0, otPay, hours, otCount=0, totCount=0;

    while(empNo!=-999)
    {
        printf("Enter the employee number (-999 to stop): ");
        scanf("%d", &empNo);

        if(empNo==-999)
            break;

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

        if(hours>=40)
        {
            otPay = 200*(hours-40)+40*150;
            if(otPay>4000)
            {
                otCount++;
            }
        }
        else
        {
            otPay = 150*hours;
            if(otPay>4000)
            {
                otCount++;
            }
        }
        totCount++;

        printf("Employee %d earned %d\n\n", empNo, otPay);
    }

    if(totCount>0)
    {
        double percentage = (double)otCount/totCount*100.0;
        printf("Percentage of employees with overtime payment exceeding 4000: %.2lf%%\n", percentage);
    }
    else
    {
        printf("No employees were processed\n");
    }

    return 0;
}
```