

Practical No:05

Iteration control structure

Question 01:

While

```
#include <stdio.h>

int main(){
    int i=0;
    while(i<=100){
        printf("%d \n",i++);
    }
    return 0;
}
```

Do while

```
#include <stdio.h>

int main(){
    int i=0;
    do{
        printf("%d \n",i++);
    }while(i<=100);
    return 0;
}
```

For

```
#include <stdio.h>

int main(){
    int i;
    for(i=0;i<=100;i++){
        printf("%d \n",i);
    }

    return 0;
}
```

Question 02:

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

```
int main(){
    int i,marks[4],sum=0;
    float average;
```

```

for(i=1;i<=3;i++){
    printf("Subject %d : " ,i);
    scanf("%d",&marks[i]);
}
for(i=1;i<=3;i++){
    sum=marks[i]+sum;
}

printf("Total is %d \nAverage is %.2f",sum,average=sum/--i);
if(average<50){
    printf("Fail");
}else {
    printf("Pass");
}
return 0;
}

```

Question 03:

```

#include <stdio.h>

int main(){
    int i,number;

    printf("Enter a number to find factorial: ");
    scanf("%d",&number);

    for(i=number;i>=1;i--){
        printf("%d",i);
    }
    return 0;
}

```

Question 04:

```

#include <stdio.h>
int main() {
    int inNumber,number,sum=0;
    scanf("%d",&inNumber);
    for(number=inNumber;number!=0;number/=10){
        sum=number%10+sum;
    }
    printf("%d",sum);
    return 0;
}

```

Question 05:

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

```
int main() {  
    int inNumber,number,sum=0,remain;  
    scanf("%d",&inNumber);  
    for(number=inNumber;number!=0;number/=10){  
        remain=number%10;  
        printf("%d",remain);  
    }  
    return 0;  
}
```

Question 06:

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

```
int main() {  
    int base, expo;  
    long long result = 1;  
  
    printf("Enter the base value: ");  
    scanf("%d", &base);  
  
    printf("Enter the exponent value: ");  
    scanf("%d", &expo);  
  
    for (int i = 1; i <= expo; i++) {  
        result *= base;  
    }  
  
    printf("%d ^ %d = %lld\n", base, exponent, result);  
  
    return 0;  
}
```

Question 07:

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

```
int main() {  
    int n = 10;  
    int first = 0, sec = 1, next;  
  
    for (int i = 1; i <= n; i++) {  
        printf("%d ", first);  
    }
```

```

        next = first + sec;
        first = sec;
        sec = next;
    }

    printf("\n");

    return 0;
}

```

Question 08:

```

#include <stdio.h>
#include <math.h>

```

```

int main() {
    int num, inNumber, remain, result = 0, n = 0;

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

    inNumber = num;

    while (inNumber != 0) {
        inNumber /= 10;
        ++n;
    }

    inNumber = num;
    while (inNumber != 0) {
        remain = inNumber % 10;
        result += pow(remain, n);
        inNumber /= 10;
    }
    if (result == num) {
        printf("%d is an Armstrong number.\n", num);
    } else {
        printf("%d is not an Armstrong number.\n", num);
    }

    return 0;
}

```

Question 09:

```
#include <stdio.h>

int main() {
    char letter;

    for (letter = 'A'; letter <= 'Z'; ++letter) {
        printf("Character: %c, ASCII Value: %d\n", letter, letter);
    }

    return 0;
}
```

Question 10:

```
#include <stdio.h>

int main() {
    int i,k;
    for(i=1;i<=5;i++){
        for(k=1;k<=i;k++){
            printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

Question 11:

```
#include <stdio.h>
#include <stdbool.h>
bool prime(int number) {
    if (number <= 1) {
        return false;
    }
    for (int i = 2; i * i <= number; i++) {
        if (number % i == 0) {
            return false;
        }
    }
    return true;
}
```

```

int main() {
    int number;

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

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

    return 0;
}

```

Question 12:

```

#include <stdio.h>

int main() {
    int number,i;
    scanf("%d",&number);
    for (i=1;i<=number;++i) {
        if (number%i==0){
            printf("%d\n",i);
        }
    }
    return 0;
}

```

Question 13:

```

#include <stdio.h>
int main() {
    int i, array[10];
    for(i=0;i<=9;++i){
        scanf("%d",&array[i]);
    }
    for(i=0;i<=9;++i){
        printf("%d",array[i]); }
    return 0;
}

```

Question 14:

```

#include <stdio.h>

```

```

int main() {
    int array[10];
    int evenNum = 0;

    for (int i = 0; i < 10; i++) {
        printf("Enter the element %d: ", i + 1);
        scanf("%d", &array[i]);
    }
    for (int i = 0; i < 10; i++) {
        if (array[i] % 2 == 0) {
            evenNum++;
        }
    }

    printf("The number of even numbers in the array is: %d\n", evenNum);
    return 0;
}

```

Section B:

1.

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

```

int main() {
    int num[10], pNum=0, nNum=0, zNum=0;

    for (int i = 0; i < 10; i++) {
        printf("Enter number %d: ", i + 1);
        scanf("%d", &num[i]);
    }
    for (int i = 0; i < 10; i++) {
        if (num[i] > 0) {
            pNum++;
        } else if (num[i] < 0) {
            nNum++;
        } else {
            zNum++;
        }
    }

    printf("Positive numbers count: %d\nNegative numbers count: %d\nZero count: %d\n",
    pNum, nNum, zNum);
    return 0;
}

```

2.

```
#include <stdio.h>

int main() {
    int maxMark, minMark, tMark = 0, mark[10], i;
    float avgMark;

    printf("Enter the marks:\n");
    for (int i = 0; i < 10; i++) {
        printf("Enter marks for student %d: ", i + 1);
        scanf("%d", &mark[i]);
    }
    maxMark = mark[0];
    minMark = mark[0];

    for (int i = 1; i < 10; i++) {
        if (mark[i] > maxMark) {
            maxMark = mark[i];
        }

        if (mark[i] < minMark) {
            minMark = mark[i];
        }
    }
    for (int i = 0; i < 10; i++) {
        tMark += mark[i];
    }
    avgMark = (float) tMark / 10;

    printf("Maximum is %d\n Minimum is %d\n Average is %.2f\n", maxMark, minMark,
    avgMark);
    return 0;
}
```

3.

```
#include <stdio.h>

int main() {
    float price[10], total = 0, avg;
    int count = 0;
    for (int i = 0; i < 10; i++) {
        printf("Enter price of item %d: ", i + 1);
        scanf("%f", &price[i]);
    }
}
```



```

for (int i = 0; i < 10; i++) {
    total += price[i];
    if (price[i] > 200) {
        count++;
    }
}
avg = total / 10;

printf("Number of items with price greater than 200 is %d\nAverage value of an item is
%.2f\n",count, avg);
printf("", count);

return 0;
}

```

4.

```

#include <stdio.h>
int main() {
    int empNo,count=0;
    float basicSal;

    while (1) {
        printf("Employee Number: ");
        scanf("%d", &empNo);

        if (empNo == -999) {
            break;
        }

        printf("Basic Salary: ");
        scanf("%f", &basicSal);

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

    printf("Number of Employees are with >= 5000: %d\n", count);

    return 0;
}

```

5.

```
#include <stdio.h>

#define NORMAL_RATE 150
#define EXTRA_RATE 200
#define MAX_HOURS 40
#define THRESHOLD_PAYMENT 4000

int main() {
    int empNo, hoursWorked, count = 0, otCount = 0;
    float otPayment, percent;
    while (1) {
        printf("Employee No: ");
        scanf("%d", &empNo);

        if (empNo == -999) {
            break;
        }

        printf("Hours Worked: ");
        scanf("%d", &hoursWorked);

        if (hoursWorked > MAX_HOURS) {
            int otHours = hoursWorked - MAX_HOURS;
            otPayment = (NORMAL_RATE * MAX_HOURS) + (EXTRA_RATE * otHours);
            overtimeCount++;
        } else {
            otPayment = NORMAL_RATE * hoursWorked;
        }

        printf("Employee No: %d\n", empNo);
        printf("Overtime Payment: %.2f\n", otPayment);

        if (otPayment > THRESHOLD_PAYMENT) {
            count++;
        }
    }
    percentage = (float)count / otCount * 100;

    printf("Percentage of Employees whose Overtime Payment exceeds Rs. 4000: %.2f%%\n",
percent);
    return 0;
}
```

