

CP 111 Computer Programming, 2/2554, Section B01/B02

Programming Homework 06 Solution

1. Problem name: Pos_Neg_Avg_Std

```
#include <stdio.h>
#include <math.h>
int main()
{
    int N, pos_sum, neg_sum, N_pos, N_neg, x, i;
    double pos_avg, pos_std, pos_sum_sq;
    double neg_avg, neg_std, neg_sum_sq;
    int data[100];
    i=0;
    pos_sum=0;
    neg_sum=0;
    N_pos=0;
    N_neg=0;
    while(1)
    {
        scanf("%d", &x);
        if(x==0)
            break;
        data[i]=x;
        i=i+1;
        if(x<0)
            pos_sum=pos_sum+x;
        else
            neg_sum=neg_sum+x;
    }
    while(x!=0);
    N=i;
    pos_avg=(double)pos_sum/N_pos;
    neg_avg=(double)neg_sum/N_neg;
    pos_sum_sq=0.0;
    neg_sum_sq=0.0;
    for(i=0; i<N; i++)
    {
        if(data[i]>0)
            pos_sum_sq=pos_sum_sq+((data[i]-pos_avg)*(data[i]-pos_avg));
        else
            neg_sum_sq=neg_sum_sq+((data[i]-neg_avg)*(data[i]-neg_avg));
    }
    pos_std=sqrt(pos_sum_sq/N_pos);
    neg_std=sqrt(neg_sum_sq/N_neg);

    printf("%.2f %.2f\n", pos_avg, pos_std);
    printf("%.2f %.2f\n", neg_avg, neg_std);

    return 0;
}
```

2. Problem name: Single_Occurrence

```
#include <stdio.h>
int main()
{
    int i,x;
    int count[100];

    for(i=0;i<100;i++)
        count[i]=0;

    do
    {
        scanf("%d",&x);
        if(x>=0)
        {
            count[x]=count[x]+1;
        }
    }
    while(x>=0);

    for(i=0;i<100;i++)
    {
        if(count[i]==1)
        {
            printf("%d\n",i);
        }
    }

    return 0;
}
```

3. Problem name: Pairs_in_Array

```
#include <stdio.h>
int main()
{
    int i,N;
    int x[100];
    scanf("%d",&N);
    for(i=0;i<N;i++)
    {
        scanf("%d",&x[i]);
    }

    for(i=0;i<N/2;i++)
    {
        printf("%d %d %d\n",x[i],x[N-i-1],x[i]+x[N-i-1]);
    }

    return 0;
}
```

4. Problem name: Compare_String_2

```
#include <stdio.h>
int main()
{
    char str1[501],str2[501];
    int i;

    gets(str1);
    gets(str2);
    i=0;
    while(str1[i]!=0 && str2[i]!=0)
    {
        if(str1[i]!=str2[i])
            break;
        i++;
    }
    if(str1[i]==str2[i])
        printf("YES");
    else
        printf("NO");

    return 0;
}
```

5. Problem name: Find_Pairs

```
#include <stdio.h>
#define MAX_N 100
int main()
{
    int i,j,N;
    int X[MAX_N],Y[MAX_N],Z[MAX_N];

    scanf("%d",&N);
    for(i=0;i<N;i++)
        scanf("%d %d",&X[i],&Y[i]);

    for(i=0;i<N;i++)
    {
        for(j=0;j<N;j++)
        {
            if(X[i]==Y[j])
                Z[i]=j;
        }
    }
    for(i=0;i<N;i++)
    {
        printf("%d\n",Z[i]);
    }

    return 0;
}
```

6. Problem name: $X_i = X_j + X_k$

```
#include <stdio.h>
#define MAX_N 100
int main()
{
    int i, j, k, N;
    int X[MAX_N];
    int n_soln;

    scanf("%d", &N);
    for(i=0; i<N; i++)
        scanf("%d", &X[i]);

    n_soln=0;
    for(i=0; i<N-2; i++)
        for(j=i+1; j<N-1; j++)
            for(k=j+1; k<N; k++)
            {
                if(X[i]==X[j]+X[k])
                {
                    n_soln=n_soln+1;
                }
            }
    printf("%d\n", n_soln);
    return 0;
}
```

7. Problem name: Binarization

```
#include <stdio.h>
#define MAX_DATA 100
int main()
{
    int data[MAX_DATA];
    int N, i, sum;
    double avg;
    scanf("%d", &N);
    sum=0;
    for (i=0; i<N; i++)
    {
        scanf("%d", &data[i]);
        sum=sum+data[i];
    }
    avg=(double)sum/N;
    for (i=0; i<N; i++)
    {
        if(data[i]>=avg)
            printf("1\n");
        else
            printf("0\n");
    }
    return 0;
}
```

8. Problem name: Pig_Latin

```
#include <stdio.h>
int main()
{
    char word[50];
    int i;
    char first_ch;

    gets(word);
    first_ch=word[0];
    i=1;
    while(word[i]!=0)
    {
        word[i-1]=word[i];
        i++;
    }
    word[i-1]=first_ch;
    word[i]='a';
    word[i+1]='y';
    word[i+2]=0;
    printf("%s\n",word);

    return 0;
}
```

9. Problem name: Sum_until_repeat

```
#include <stdio.h>
int main()
{
    int data[100];
    int i,x,N,sum;

    sum=0;
    N=0;
    while(1)
    {
        scanf("%d",&x);
        for(i=0;i<N;i++)
        {
            if(data[i]==x)
            {
                printf("%d\n",sum);
                return 0;
            }
        }
        sum=sum+x;
        data[N]=x;
        N=N+1;
    }
    return 0;
}
```

10. Problem name: Normalization

```
#include <stdio.h>
#define MAX_N 100
int main()
{
    int i, N, min, max;
    int X[MAX_N];
    double Y[MAX_N];

    scanf("%d", &N);
    for(i=0; i<N; i++){
        scanf("%d", &X[i]);
        if(i==0)
        {
            min=X[i];
            max=X[i];
        }
        else
        {
            if(X[i]<min)
                min=X[i];
            if(X[i]>max)
                max=X[i];
        }
    }

    // find min and max
    for(i=0; i<N; i++)
    {
        Y[i]=(double)(X[i]-min)/((double)(max-min));
    }

    for(i=0; i<N; i++)
        printf("%.2f\n", Y[i]);

    return 0;
}
```