INFO II PROJECT WEATHER STATION

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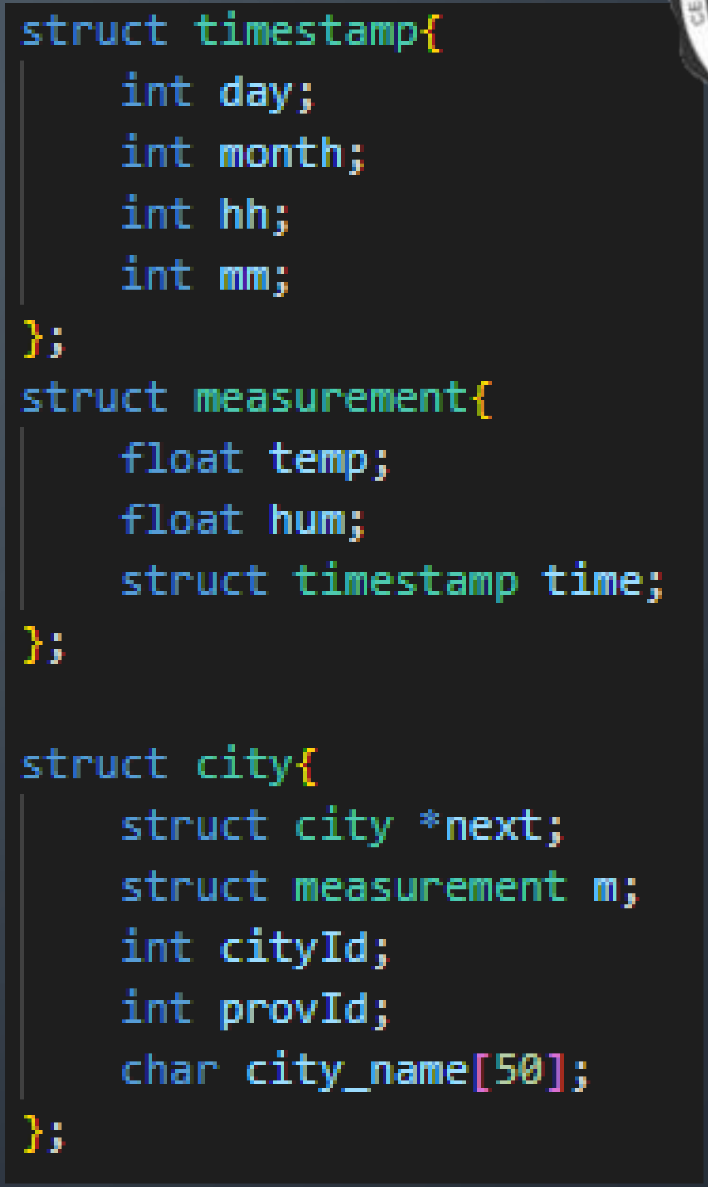

```c
struct timestamp{
    int day;
    int month;
    int hh;
    int mm;
};
struct measurement{
    float temp;
    float hum;
    struct timestamp time;
};

struct city{
    struct city *next;
    struct measurement m;
    int cityId;
    int provId;
    char city_name[50];
};
```

APPROACH TO THE STATEMENT OF WORK

This work has the following requirements:

- Total of the samples stored in the lists belonging to each province
- Average temperature of each province
- Average temperature of each city
- Warmest city in each province
- Coldest city of each province
- Coldest day in each province
- Hottest day in each city
- Best province for growing peppers (average temperature close to 23 degrees Celsius)

Work Objectives:

Evaluate the contents and skills acquired during the teaching of the subject.

In addition, soft skills will be taken into account, such as collaborative group work, individual work exposure and presentation written.

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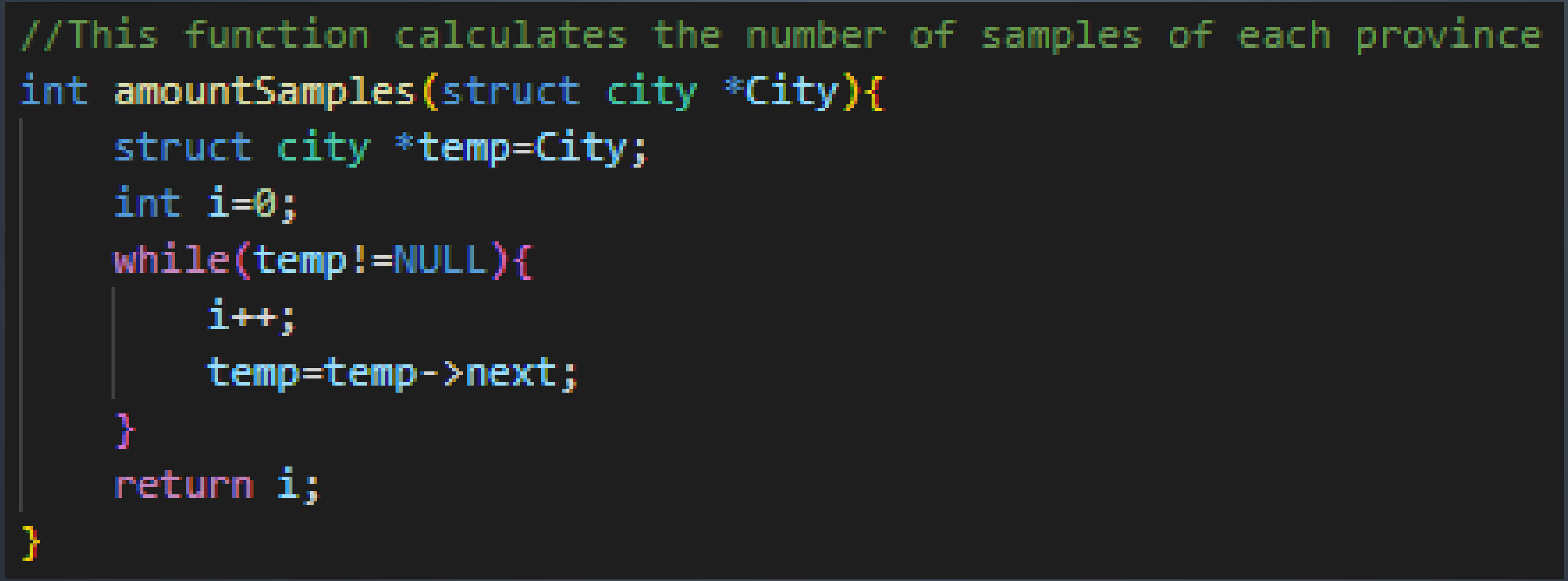
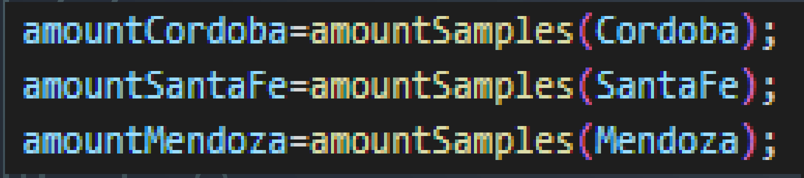
TOTAL OF THE SAMPLES STORED IN THE LISTS BELONGING TO EACH PROVINCE



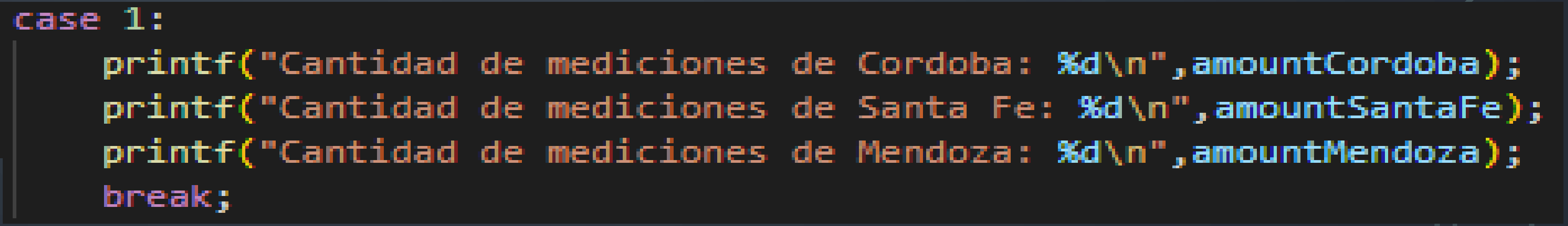
```c
//This function calculates the number of samples of each province
int amountSamples(struct city *City){
    struct city *temp=City;
    int i=0;
    while(temp!=NULL){
        i++;
        temp=temp->next;
    }
    return i;
}
```

In this function we search for the number of samples in each province.

In the main function, the number of measurements per province is printed

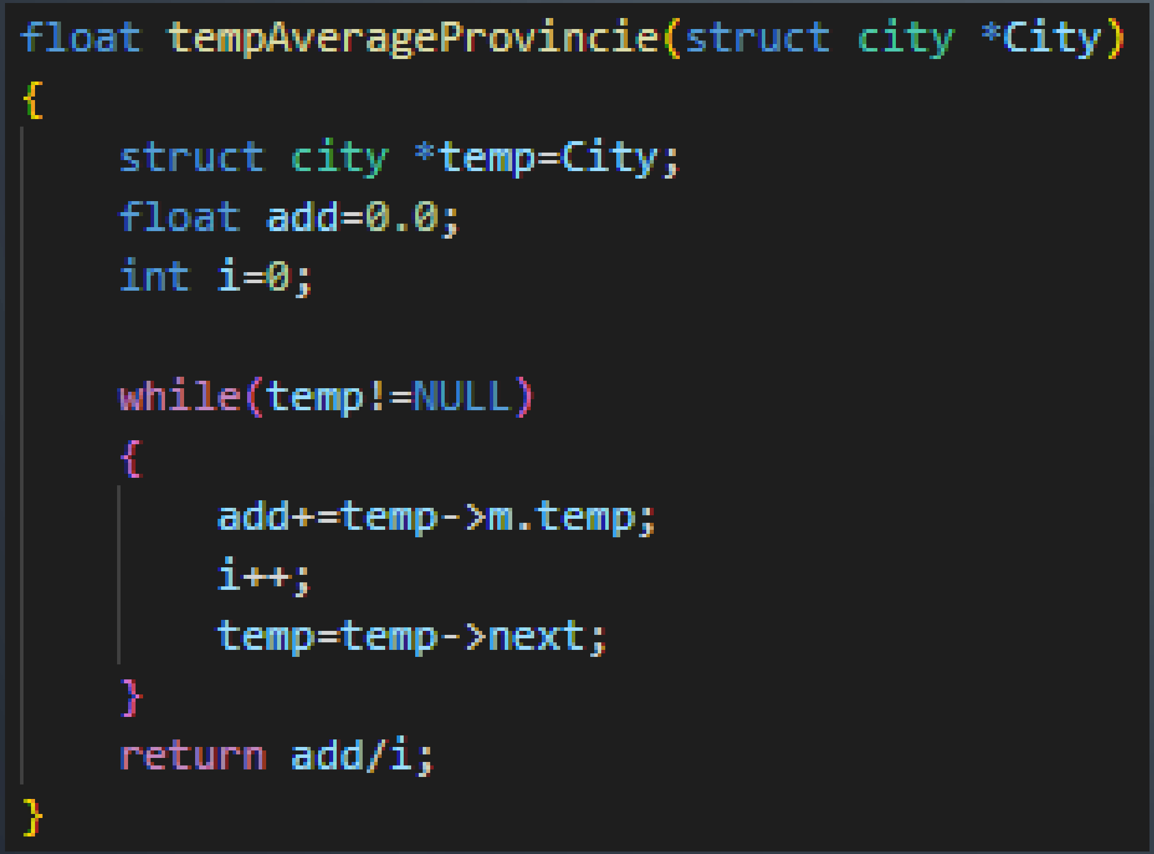


```c
amountCordoba=amountSamples(Cordoba);
amountSantaFe=amountSamples(SantaFe);
amountMendoza=amountSamples(Mendoza);
```



```c
case 1:
    printf("Cantidad de mediciones de Cordoba: %d\n",amountCordoba);
    printf("Cantidad de mediciones de Santa Fe: %d\n",amountSantaFe);
    printf("Cantidad de mediciones de Mendoza: %d\n",amountMendoza);
    break;
```

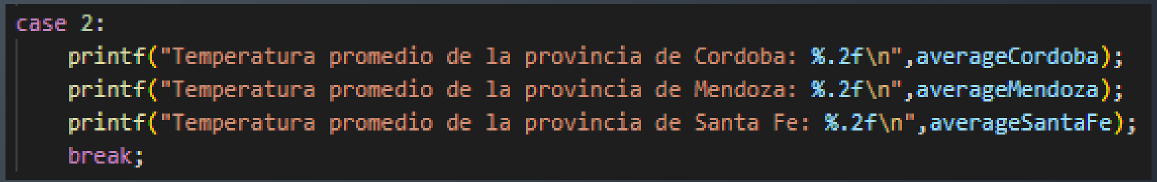
AVERAGE TEMPERATURE OF EACH PROVINCE



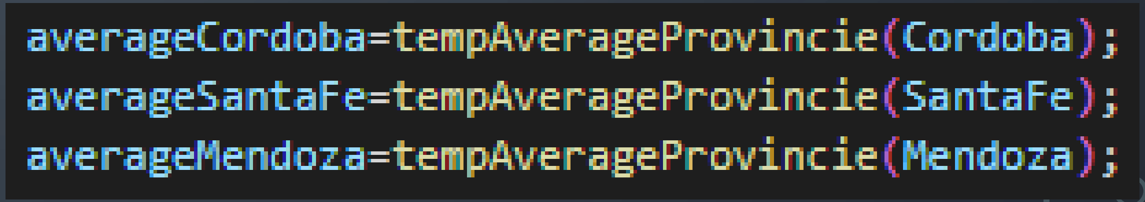
```c
float tempAverageProvincie(struct city *City)
{
    struct city *temp=City;
    float add=0.0;
    int i=0;

    while(temp!=NULL)
    {
        add+=temp->m.temp;
        i++;
        temp=temp->next;
    }
    return add/i;
}
```

The following function shows the average temperature of each province.

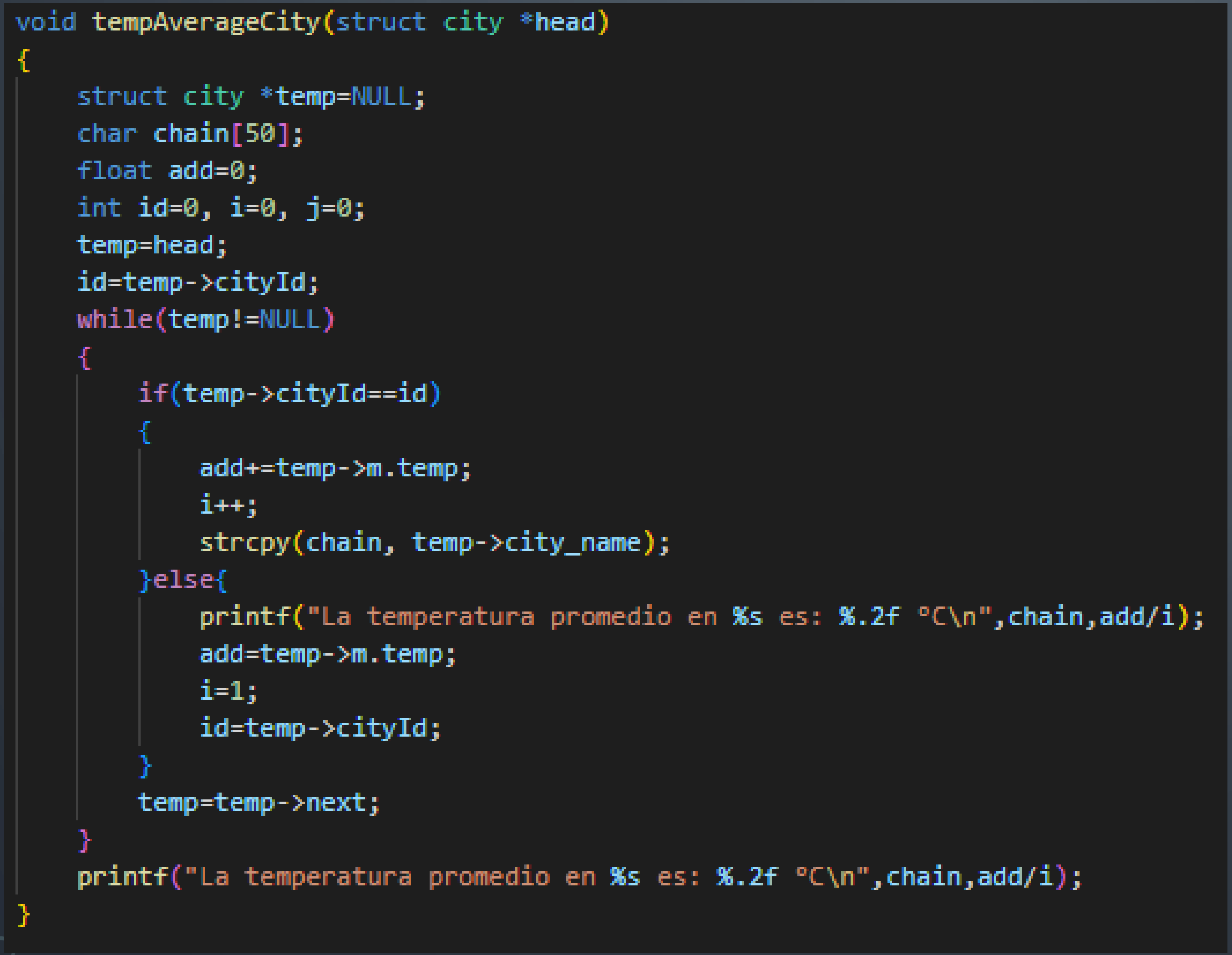


```c
case 2:
    printf("Temperatura promedio de la provincia de Cordoba: %.2f\n",averageCordoba);
    printf("Temperatura promedio de la provincia de Mendoza: %.2f\n",averageMendoza);
    printf("Temperatura promedio de la provincia de Santa Fe: %.2f\n",averageSantaFe);
    break;
```



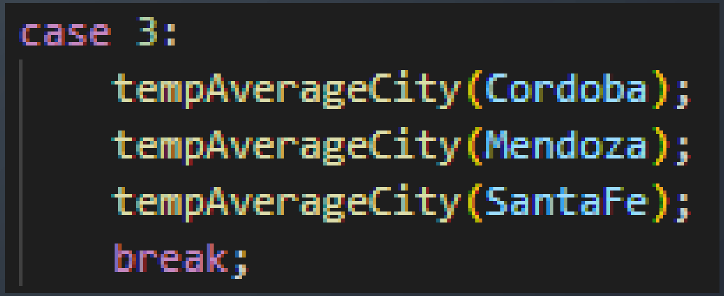
```c
averageCordoba=tempAverageProvincie(Cordoba);
averageSantaFe=tempAverageProvincie(SantaFe);
averageMendoza=tempAverageProvincie(Mendoza);
```

AVERAGE TEMPERATURE OF EACH CITY



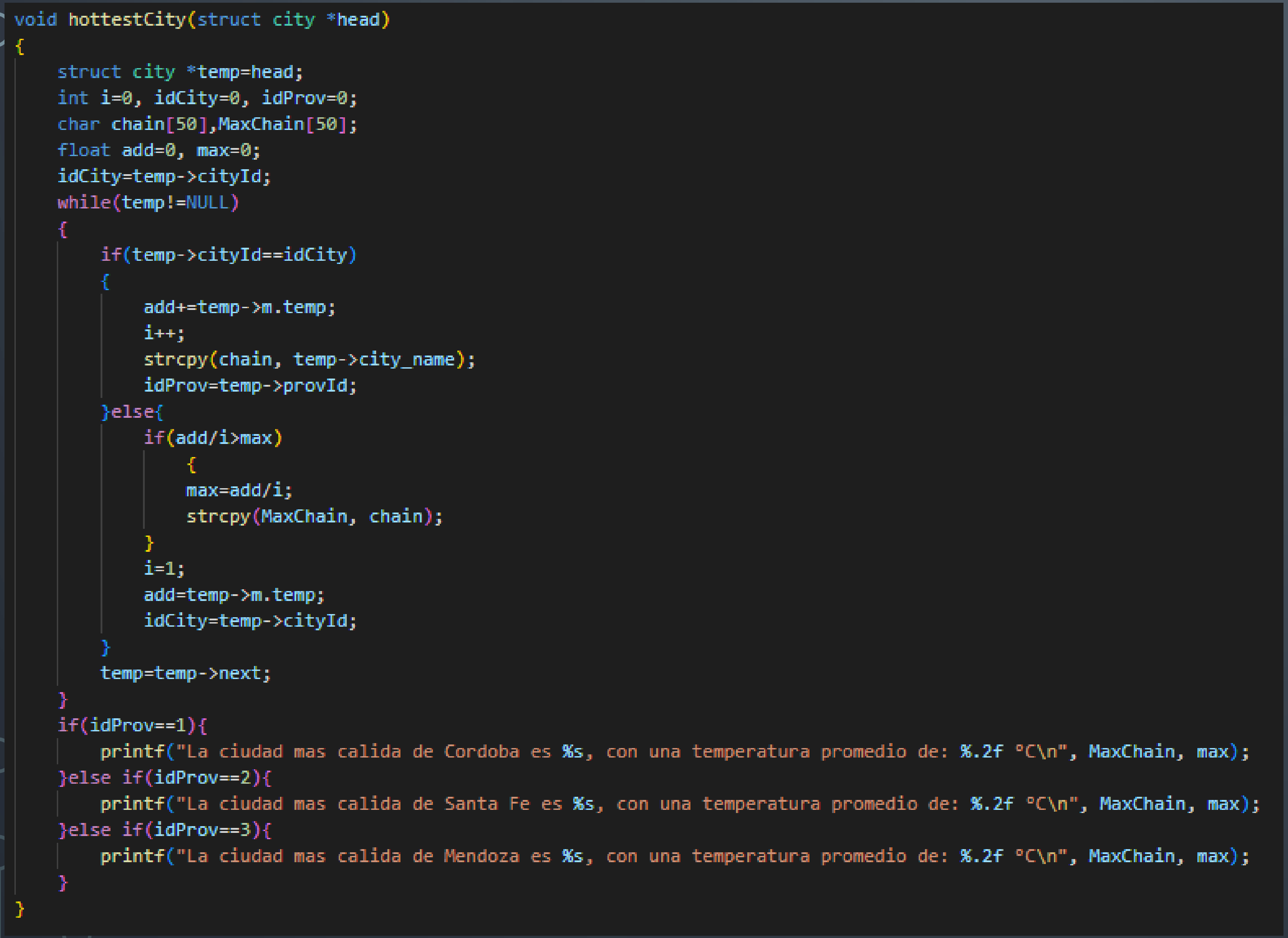
```c
void tempAverageCity(struct city *head)
{
    struct city *temp=NULL;
    char chain[50];
    float add=0;
    int id=0, i=0, j=0;
    temp=head;
    id=temp->cityId;
    while(temp!=NULL)
    {
        if(temp->cityId==id)
        {
            add+=temp->m.temp;
            i++;
            strcpy(chain, temp->city_name);
        }else{
            printf("La temperatura promedio en %s es: %.2f °C\n",chain,add/i);
            add=temp->m.temp;
            i=1;
            id=temp->cityId;
        }
        temp=temp->next;
    }
    printf("La temperatura promedio en %s es: %.2f °C\n",chain,add/i);
}
```

The average temperature of each city carried out in a function is shown and then it is shown how the function was called in the main



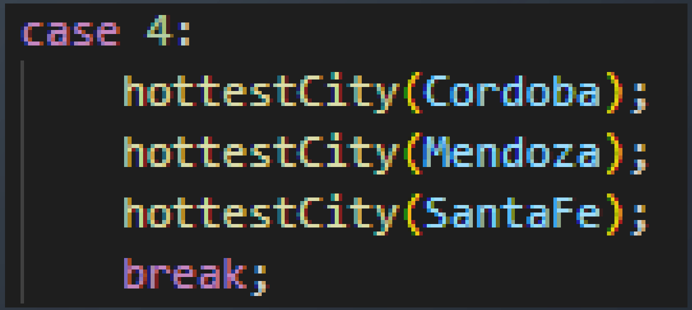
```c
case 3:
    tempAverageCity(Cordoba);
    tempAverageCity(Mendoza);
    tempAverageCity(SantaFe);
    break;
```

WARMEST CITY IN EACH PROVINCE



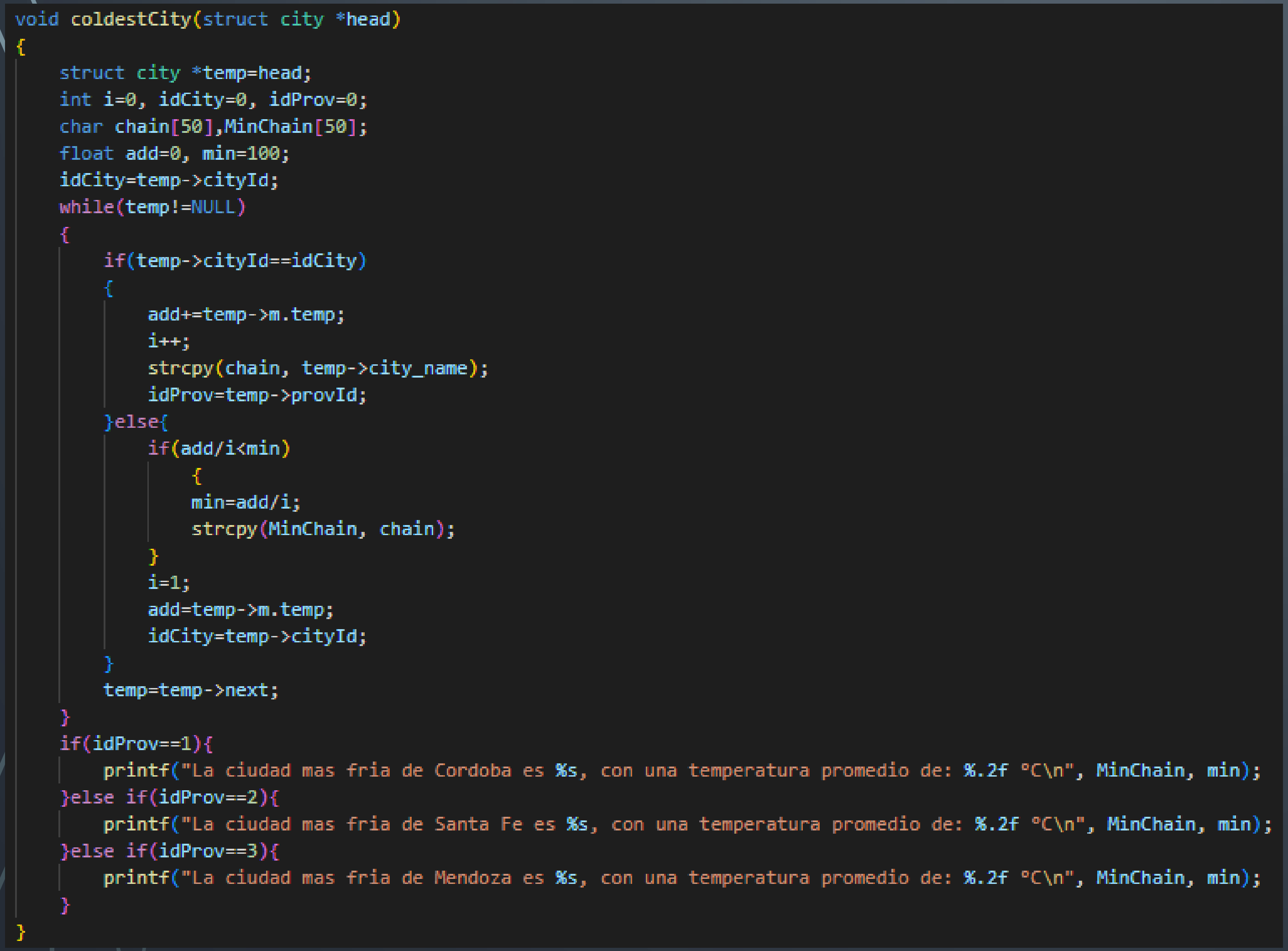
```
void hottestCity(struct city *head)
{
    struct city *temp=head;
    int i=0, idCity=0, idProv=0;
    char chain[50],MaxChain[50];
    float add=0, max=0;
    idCity=temp->cityId;
    while(temp!=NULL)
    {
        if(temp->cityId==idCity)
        {
            add+=temp->m.temp;
            i++;
            strcpy(chain, temp->city_name);
            idProv=temp->provId;
        }else{
            if(add/i>max)
                {
                max=add/i;
                strcpy(MaxChain, chain);
            }
            i=1;
            add=temp->m.temp;
            idCity=temp->cityId;
        }
        temp=temp->next;
    }
    if(idProv==1){
        printf("La ciudad mas calida de Cordoba es %s, con una temperatura promedio de: %.2f °C\n", MaxChain, max);
    }else if(idProv==2){
        printf("La ciudad mas calida de Santa Fe es %s, con una temperatura promedio de: %.2f °C\n", MaxChain, max);
    }else if(idProv==3){
        printf("La ciudad mas calida de Mendoza es %s, con una temperatura promedio de: %.2f °C\n", MaxChain, max);
    }
}
```

In this function we search for the warmest city of each provinces (Córdoba, Santa Fé and Mendoza).



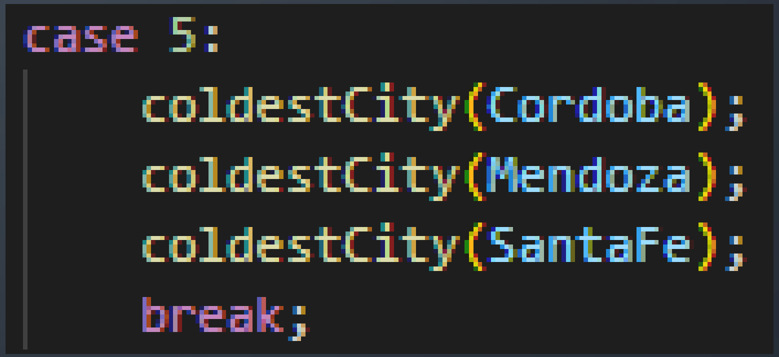
```
case 4:
        hottestCity(Cordoba);
        hottestCity(Mendoza);
        hottestCity(SantaFe);
        break;
```

COLDEST CITY OF EACH PROVINCE



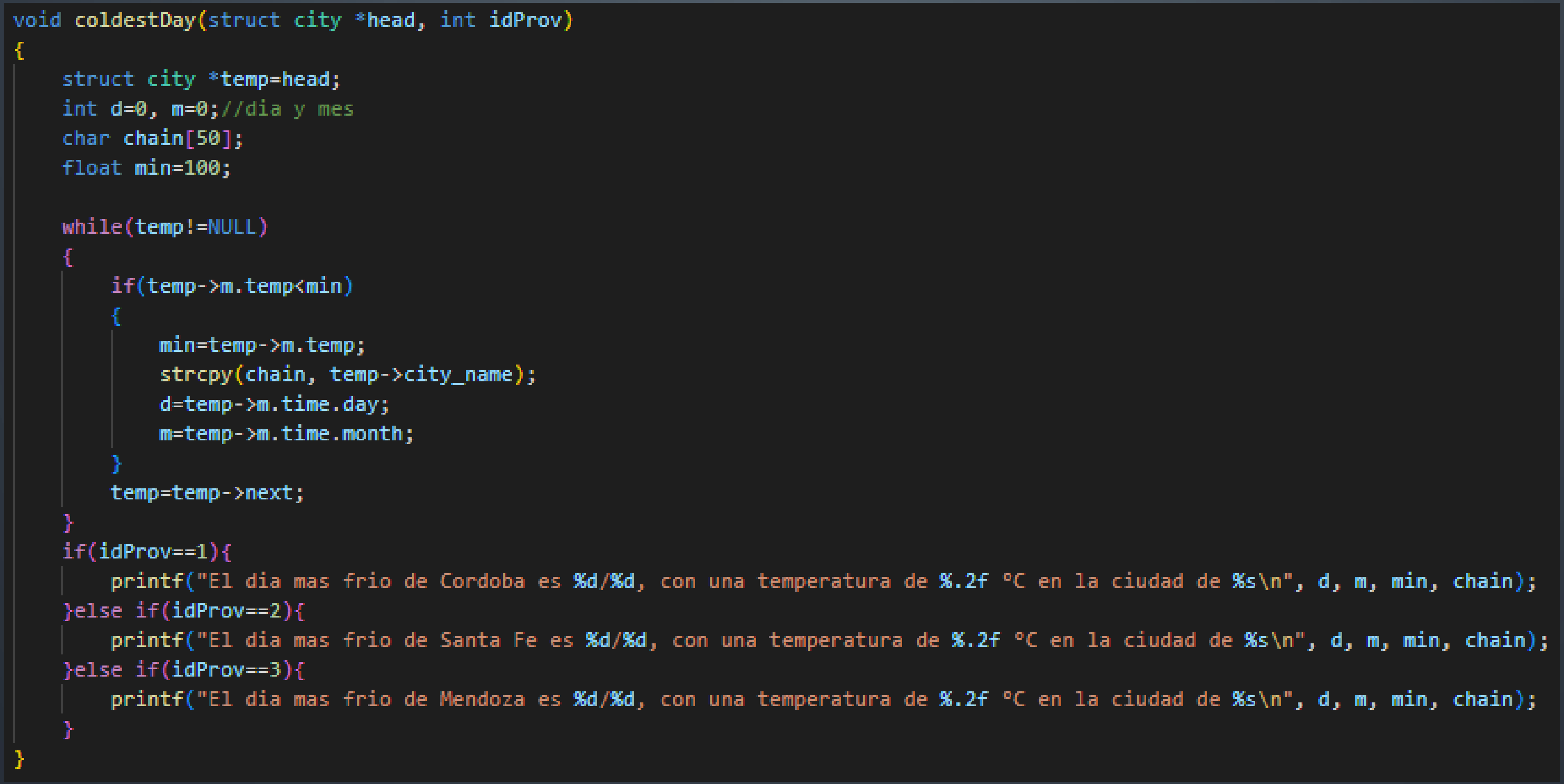
```c
void coldestCity(struct city *head)
{
    struct city *temp=head;
    int i=0, idCity=0, idProv=0;
    char chain[50],MinChain[50];
    float add=0, min=100;
    idCity=temp->cityId;
    while(temp!=NULL)
    {
        if(temp->cityId==idCity)
        {
            add+=temp->m.temp;
            i++;
            strcpy(chain, temp->city_name);
            idProv=temp->provId;
        }else{
            if(add/i<min)
              {
                min=add/i;
                strcpy(MinChain, chain);
            }
            i=1;
            add=temp->m.temp;
            idCity=temp->cityId;
        }
        temp=temp->next;
    }
    if(idProv==1){
        printf("La ciudad mas fria de Cordoba es %s, con una temperatura promedio de: %.2f °C\n", MinChain, min);
    }else if(idProv==2){
        printf("La ciudad mas fria de Santa Fe es %s, con una temperatura promedio de: %.2f °C\n", MinChain, min);
    }else if(idProv==3){
        printf("La ciudad mas fria de Mendoza es %s, con una temperatura promedio de: %.2f °C\n", MinChain, min);
    }
}
```

In this function we search for the coldest city of each provinces (Córdoba, Santa Fé and Mendoza).



```c
case 5:
        coldestCity(Cordoba);
        coldestCity(Mendoza);
        coldestCity(SantaFe);
        break;
```

COLDEST DAY IN EACH PROVINCE

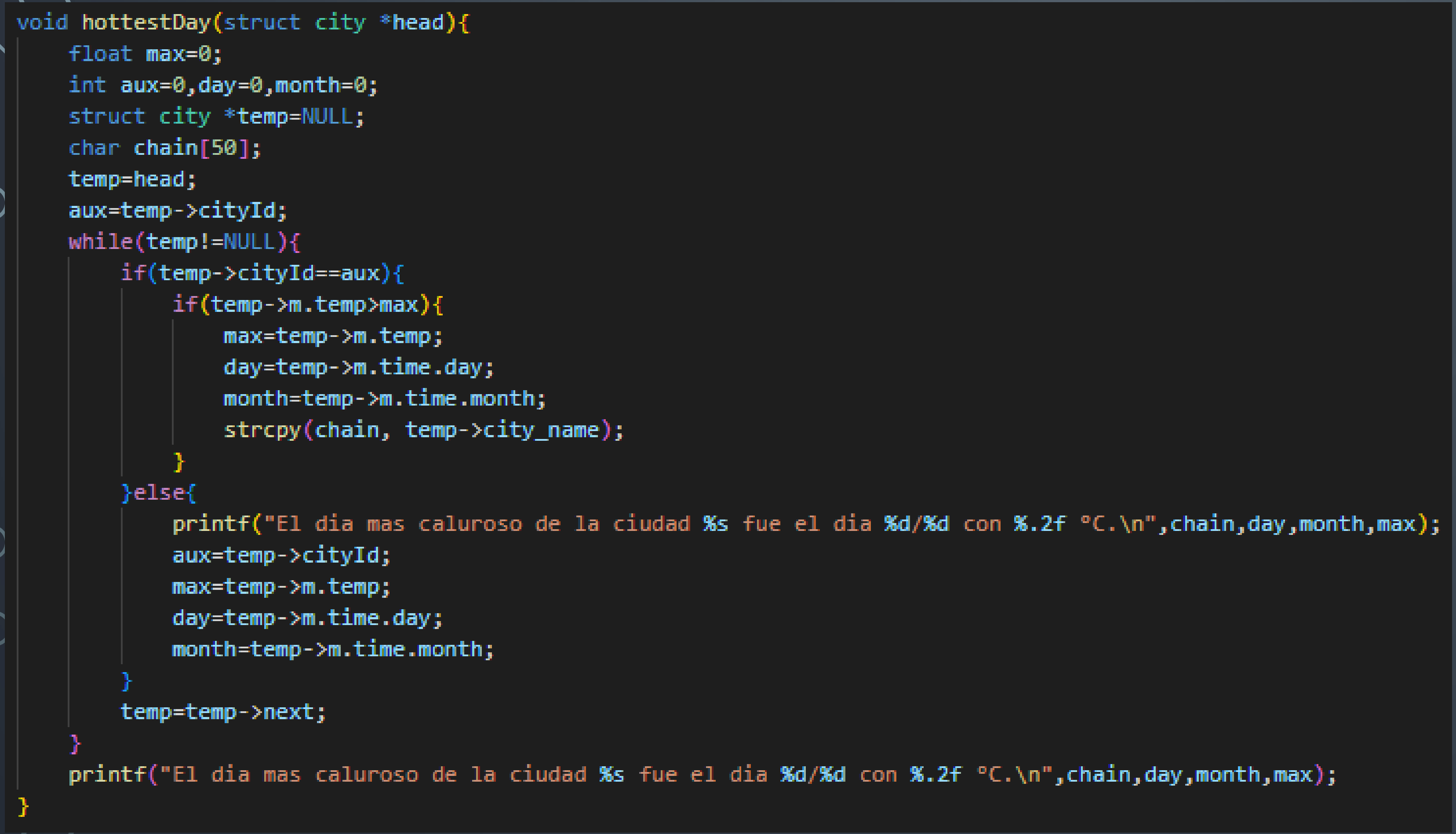


```c
void coldestDay(struct city *head, int idProv)
{
    struct city *temp=head;
    int d=0, m=0;//dia y mes
    char chain[50];
    float min=100;

    while(temp!=NULL)
    {
        if(temp->m.temp<min)
        {
            min=temp->m.temp;
            strcpy(chain, temp->city_name);
            d=temp->m.time.day;
            m=temp->m.time.month;
        }
        temp=temp->next;
    }
    if(idProv==1){
        printf("El dia mas frio de Cordoba es %d/%d, con una temperatura de %.2f °C en la ciudad de %s\n", d, m, min, chain);
    }else if(idProv==2){
        printf("El dia mas frio de Santa Fe es %d/%d, con una temperatura de %.2f °C en la ciudad de %s\n", d, m, min, chain);
    }else if(idProv==3){
        printf("El dia mas frio de Mendoza es %d/%d, con una temperatura de %.2f °C en la ciudad de %s\n", d, m, min, chain);
    }
}
```

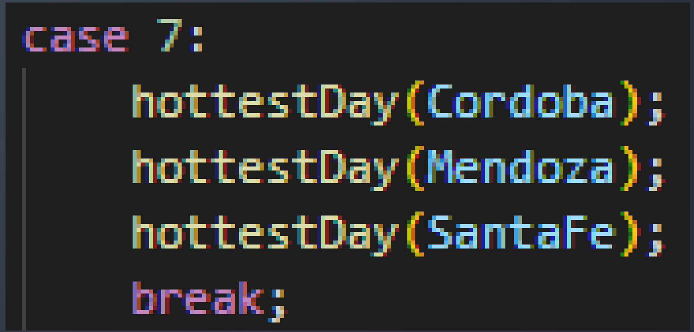
This function searches for the coldest temperature in each province, saves its name and the day when it occurred.

HOTTEST DAY IN EACH CITY



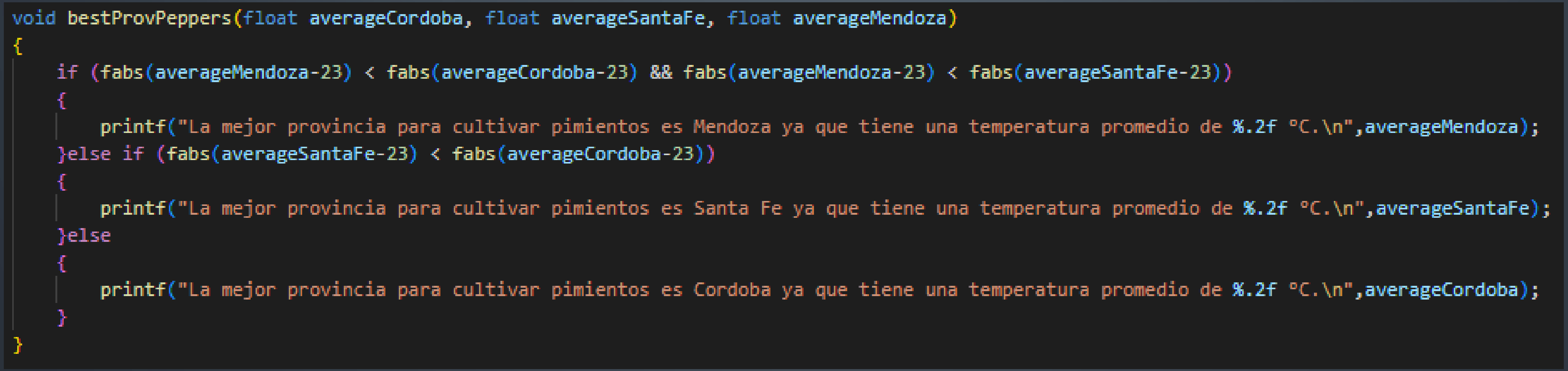
```c
void hottestDay(struct city *head){
    float max=0;
    int aux=0,day=0,month=0;
    struct city *temp=NULL;
    char chain[50];
    temp=head;
    aux=temp->cityId;
    while(temp!=NULL){
        if(temp->cityId==aux){
            if(temp->m.temp>max){
                max=temp->m.temp;
                day=temp->m.time.day;
                month=temp->m.time.month;
                strcpy(chain, temp->city_name);
            }
        }else{
            printf("El dia mas caluroso de la ciudad %s fue el dia %d/%d con %.2f °C.\n",chain,day,month,max);
            aux=temp->cityId;
            max=temp->m.temp;
            day=temp->m.time.day;
            month=temp->m.time.month;
        }
        temp=temp->next;
    }
    printf("El dia mas caluroso de la ciudad %s fue el dia %d/%d con %.2f °C.\n",chain,day,month,max);
}
```

In this function we search for the warmest day of each city.



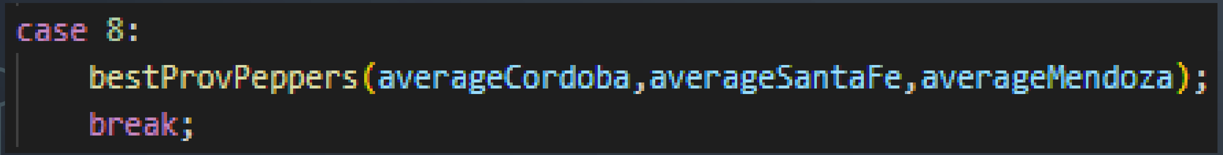
```c
case 7:
    hottestDay(Cordoba);
    hottestDay(Mendoza);
    hottestDay(SantaFe);
    break;
```

BEST PROVINCE FOR GROWING PEPPERS (AVERAGE TEMPERATURE CLOSE TO 23 DEGREES CELSIUS)



```
void bestProvPeppers(float averageCordoba, float averageSantaFe, float averageMendoza)
{
    if (fabs(averageMendoza-23) < fabs(averageCordoba-23) && fabs(averageMendoza-23) < fabs(averageSantaFe-23))
    {
        printf("La mejor provincia para cultivar pimientos es Mendoza ya que tiene una temperatura promedio de %.2f °C.\n",averageMendoza);
    }else if (fabs(averageSantaFe-23) < fabs(averageCordoba-23))
    {
        printf("La mejor provincia para cultivar pimientos es Santa Fe ya que tiene una temperatura promedio de %.2f °C.\n",averageSantaFe);
    }else
    {
        printf("La mejor provincia para cultivar pimientos es Cordoba ya que tiene una temperatura promedio de %.2f °C.\n",averageCordoba);
    }
}
```

In this function we pass the average temperatures of each province and check which one has the lowest temperature difference with 23°C



```
case 8:
    bestProvPeppers(averageCordoba,averageSantaFe,averageMendoza);
    break;
```

Thank you