

### 3.1

Bài tập hệ thống số :  $a = (22122009)_{16}$  và  $b = (A10420F3)_{16}$

a.

$$a = 9 \times 1 + 2 \times 16^3 + 2 \times 16^4 + 1 \times 16^5 + 2 \times 16^6 + 2 \times 16^7 = 571613193_{10}$$

$$a = 0010\ 0010\ 0001\ 0010\ 0010\ 0000\ 0000\ 1001_2$$

b.

$$b = 1010\ 0001\ 0000\ 0100\ 0010\ 0000\ 1111\ 0011_2$$

$$\text{not } a = 1101\ 1101\ 1110\ 1101\ 1101\ 1111\ 1111\ 0110$$

$$a \text{ and } b = 0010\ 0000\ 0000\ 0000\ 0010\ 0000\ 0000\ 0001$$

$$a \text{ or } b = 1010\ 0011\ 0001\ 0110\ 0010\ 0000\ 1111\ 1011$$

$$a \text{ xor } b = 1000\ 0011\ 0001\ 0110\ 0000\ 0000\ 1111\ 1010$$

c.

kích thước a là 16 byte

kích thước b là 16 byte

d.

$$\text{bù 1 của } b = 0101\ 1110\ 1111\ 1011\ 1101\ 1111\ 0000\ 1100$$

$$\text{giá trị } b = -1593564940$$

e.

$$\text{bù 2 của } b = 0101\ 1110\ 1111\ 1011\ 1101\ 1111\ 0000\ 1101$$

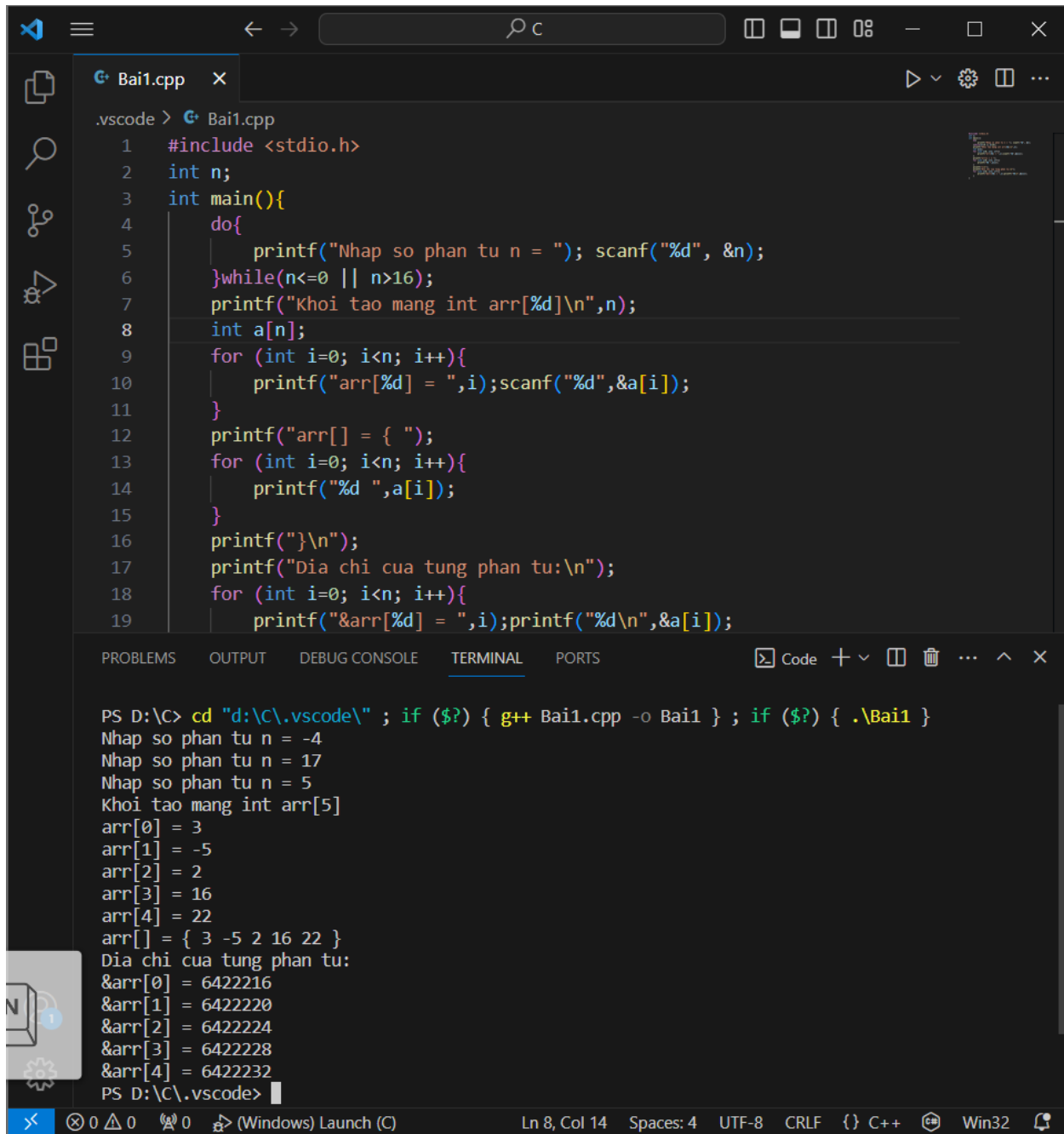
$$\text{giá trị } b = -1593564941$$

f.

ý nghĩa là 22/12/2009

## 3.2

### Bài 1



The image shows a Visual Studio Code editor window with a C++ file named `Bai1.cpp`. The code is as follows:

```
1  #include <stdio.h>
2  int n;
3  int main(){
4      do{
5          printf("Nhap so phan tu n = "); scanf("%d", &n);
6      }while(n<=0 || n>16);
7      printf("Khoi tao mang int arr[%d]\n",n);
8      int a[n];
9      for (int i=0; i<n; i++){
10         printf("arr[%d] = ",i);scanf("%d",&a[i]);
11     }
12     printf("arr[] = { ");
13     for (int i=0; i<n; i++){
14         printf("%d ",a[i]);
15     }
16     printf("}\n");
17     printf("Dia chi cua tung phan tu:\n");
18     for (int i=0; i<n; i++){
19         printf("&arr[%d] = ",i);printf("%d\n",&a[i]);
```

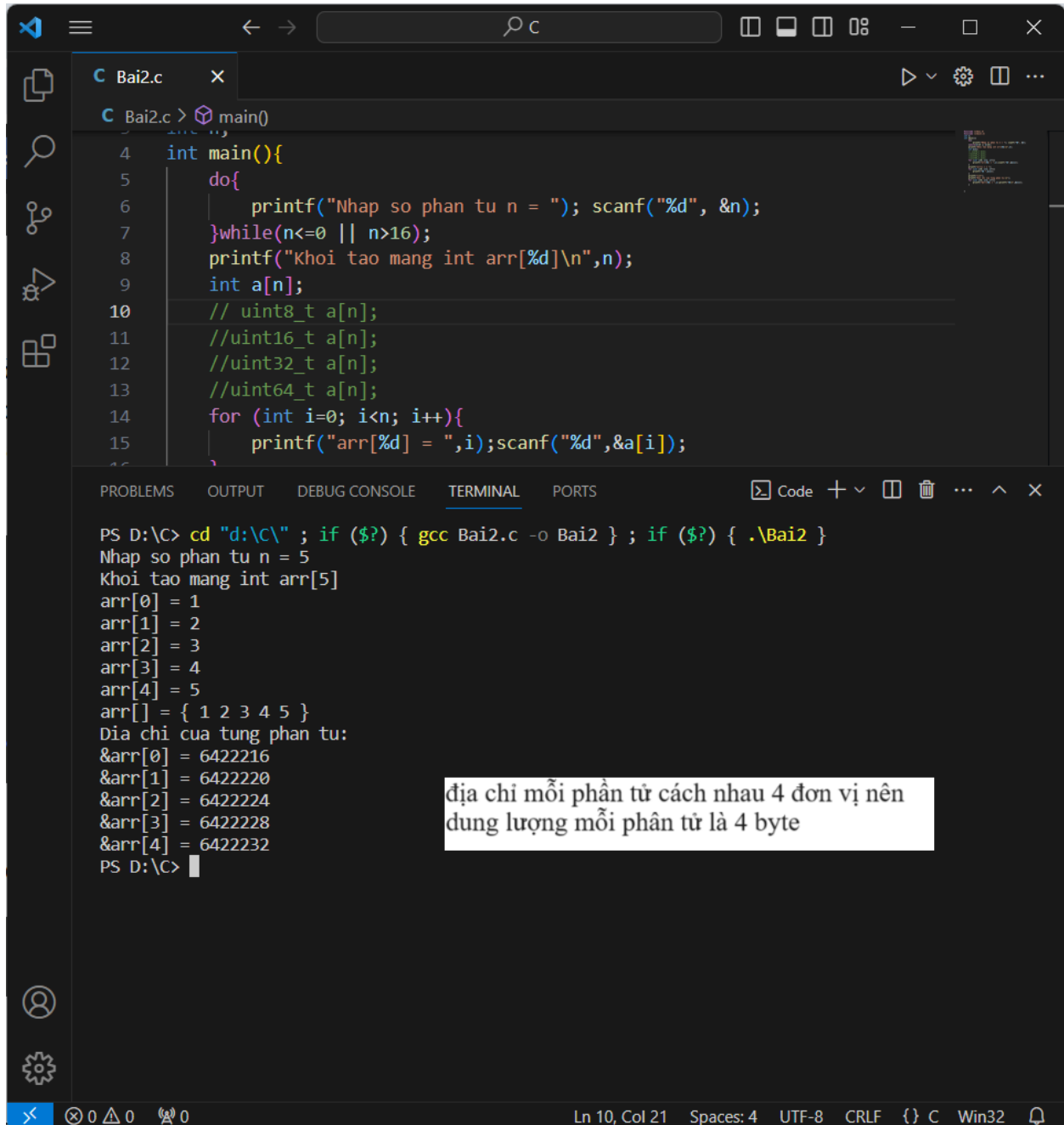
The terminal output shows the program's execution:

```
PS D:\C> cd "d:\C\.vscode\" ; if ($?) { g++ Bai1.cpp -o Bai1 } ; if ($?) { .\Bai1 }
Nhap so phan tu n = -4
Nhap so phan tu n = 17
Nhap so phan tu n = 5
Khoi tao mang int arr[5]
arr[0] = 3
arr[1] = -5
arr[2] = 2
arr[3] = 16
arr[4] = 22
arr[] = { 3 -5 2 16 22 }
Dia chi cua tung phan tu:
&arr[0] = 6422216
&arr[1] = 6422220
&arr[2] = 6422224
&arr[3] = 6422228
&arr[4] = 6422232
PS D:\C\.vscode>
```

The status bar at the bottom indicates the file is at line 8, column 14, with 4 spaces, UTF-8 encoding, CRLF line endings, and C++ language.

## Bài 2

Kiểu int



The image shows a Visual Studio Code editor window with a C program named `Bai2.c` and its execution output in the terminal.

**Code in `Bai2.c`:**

```
1 // Bai2.c
2 #include <stdio.h>
3
4 int main(){
5     do{
6         printf("Nhap so phan tu n = "); scanf("%d", &n);
7     }while(n<=0 || n>16);
8     printf("Khoi tao mang int arr[%d]\n",n);
9     int a[n];
10    // uint8_t a[n];
11    //uint16_t a[n];
12    //uint32_t a[n];
13    //uint64_t a[n];
14    for (int i=0; i<n; i++){
15        printf("arr[%d] = ",i);scanf("%d",&a[i]);
16    }
```

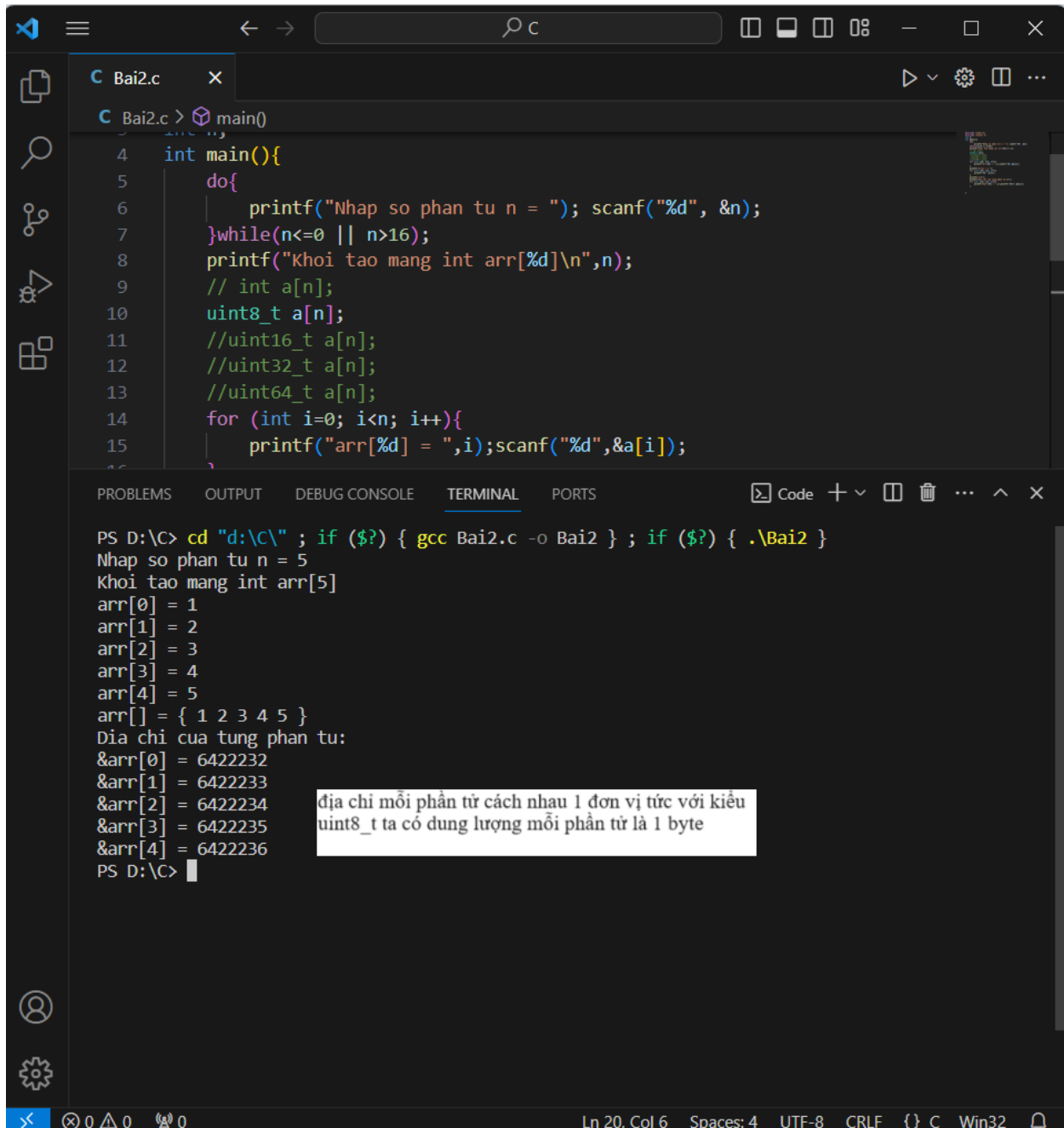
**Terminal Output:**

```
PS D:\C> cd "d:\c\" ; if ($?) { gcc Bai2.c -o Bai2 } ; if ($?) { .\Bai2 }
Nhap so phan tu n = 5
Khoi tao mang int arr[5]
arr[0] = 1
arr[1] = 2
arr[2] = 3
arr[3] = 4
arr[4] = 5
arr[] = { 1 2 3 4 5 }
Dia chi cua tung phan tu:
&arr[0] = 6422216
&arr[1] = 6422220
&arr[2] = 6422224
&arr[3] = 6422228
&arr[4] = 6422232
PS D:\C>
```

A text box highlights the memory addresses: `&arr[0] = 6422216`, `&arr[1] = 6422220`, `&arr[2] = 6422224`, `&arr[3] = 6422228`, and `&arr[4] = 6422232`. The text inside the box states: "địa chỉ mỗi phần tử cách nhau 4 đơn vị nên dung lượng mỗi phần tử là 4 byte".

## Bài 2

### Kiểu uint8\_t



The screenshot shows a Visual Studio Code editor with a C program named `Bai2.c` and its execution output in the terminal.

**Code in Bai2.c:**

```
1 // ...  
2  
3  
4 int main(){  
5     do{  
6         printf("Nhap so phan tu n = "); scanf("%d", &n);  
7     }while(n<=0 || n>16);  
8     printf("Khoi tao mang int arr[%d]\n",n);  
9     // int a[n];  
10    uint8_t a[n];  
11    //uint16_t a[n];  
12    //uint32_t a[n];  
13    //uint64_t a[n];  
14    for (int i=0; i<n; i++){  
15        printf("arr[%d] = ",i);scanf("%d",&a[i]);  
16    }
```

**Terminal Output:**

```
PS D:\C> cd "d:\C\" ; if ($?) { gcc Bai2.c -o Bai2 } ; if ($?) { .\Bai2 }  
Nhap so phan tu n = 5  
Khoi tao mang int arr[5]  
arr[0] = 1  
arr[1] = 2  
arr[2] = 3  
arr[3] = 4  
arr[4] = 5  
arr[] = { 1 2 3 4 5 }  
Dia chi cua tung phan tu:  
&arr[0] = 6422232  
&arr[1] = 6422233  
&arr[2] = 6422234  
&arr[3] = 6422235  
&arr[4] = 6422236  
PS D:\C>
```

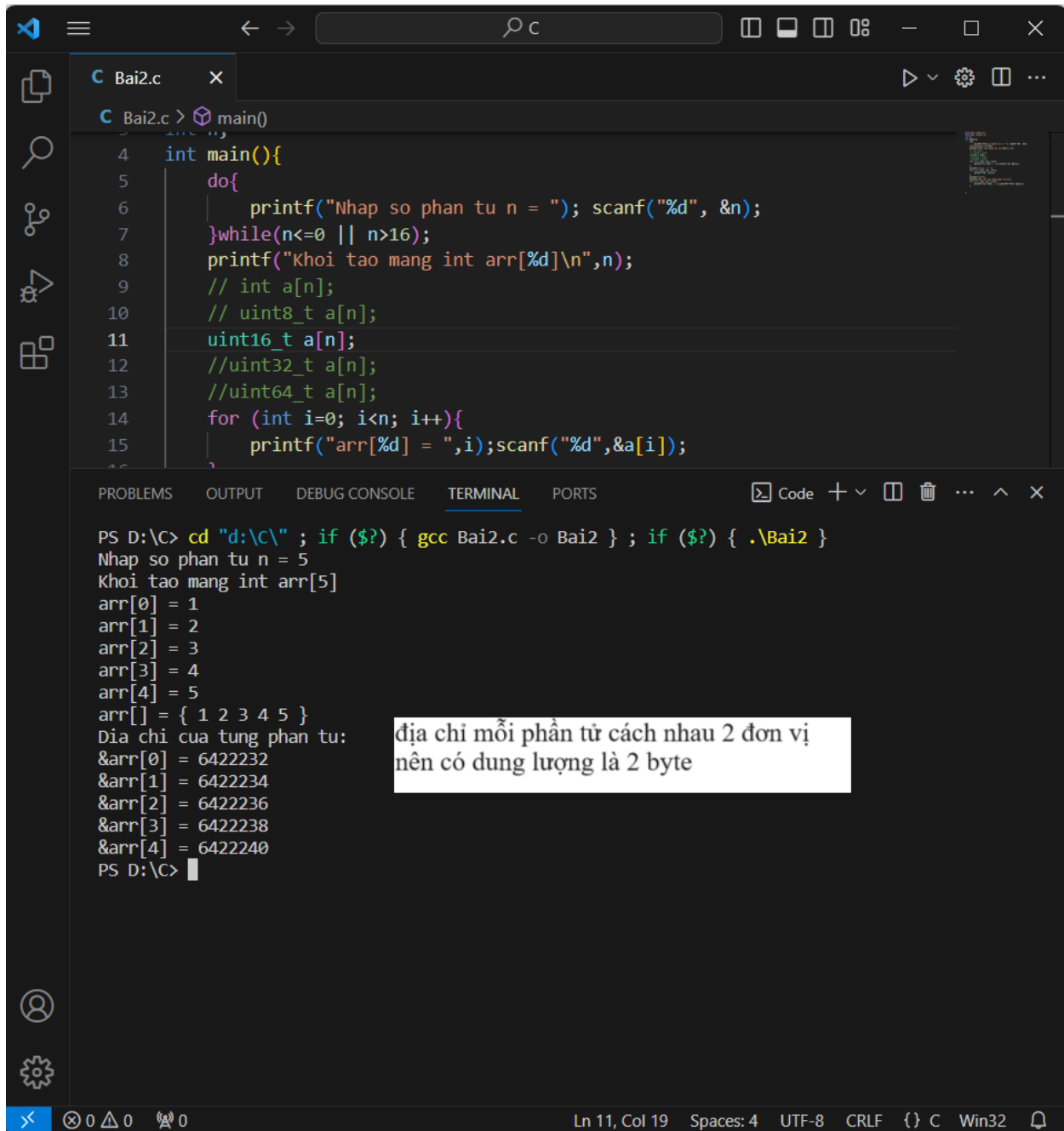
**Annotation:**

địa chỉ mỗi phần tử cách nhau 1 đơn vị tức với kiểu `uint8_t` ta có dung lượng mỗi phần tử là 1 byte

The status bar at the bottom indicates the current position is Line 20, Column 6, with 4 spaces, UTF-8 encoding, CRLF line endings, and the C language standard.

## Bài 2

### Kiểu uint16\_t



The image shows a Visual Studio Code editor window with a C program named `Bai2.c` and its execution output in the terminal.

**Code in `Bai2.c`:**

```
1 // Bai2.c
2 #include <stdio.h>
3
4 int main(){
5     do{
6         printf("Nhap so phan tu n = "); scanf("%d", &n);
7     }while(n<=0 || n>16);
8     printf("Khoi tao mang int arr[%d]\n",n);
9     // int a[n];
10    // uint8_t a[n];
11    uint16_t a[n];
12    //uint32_t a[n];
13    //uint64_t a[n];
14    for (int i=0; i<n; i++){
15        printf("arr[%d] = ",i);scanf("%d",&a[i]);
16    }
```

**Terminal Output:**

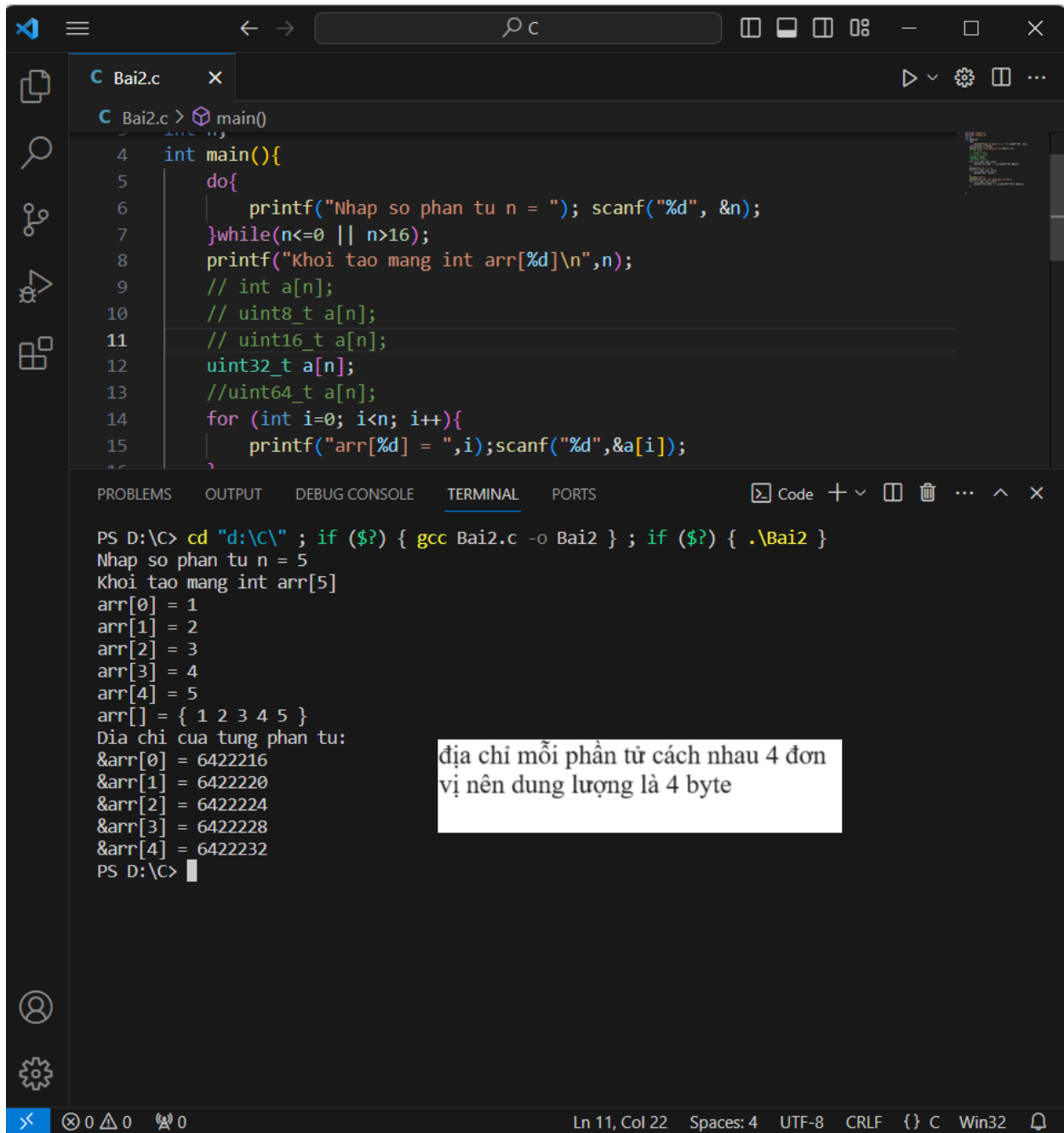
```
PS D:\C> cd "d:\C\" ; if ($?) { gcc Bai2.c -o Bai2 } ; if ($?) { .\Bai2 }
Nhap so phan tu n = 5
Khoi tao mang int arr[5]
arr[0] = 1
arr[1] = 2
arr[2] = 3
arr[3] = 4
arr[4] = 5
arr[] = { 1 2 3 4 5 }
Dia chi cua tung phan tu:
&arr[0] = 6422232
&arr[1] = 6422234
&arr[2] = 6422236
&arr[3] = 6422238
&arr[4] = 6422240
PS D:\C>
```

A text box highlights the memory addresses, stating: "địa chỉ mỗi phần tử cách nhau 2 đơn vị nên có dung lượng là 2 byte" (addresses of each element are 2 units apart, so the capacity is 2 bytes).

The status bar at the bottom shows: Ln 11, Col 19 Spaces: 4 UTF-8 CRLF {} C Win32

## Bài 2

### Uint32\_t



The image shows a Visual Studio Code editor window with a C file named `Bai2.c`. The code defines a `main` function that prompts the user for the number of elements `n` in an array. It then declares the array using `uint32_t` and fills it with values from 1 to `n`. The terminal output shows the program's execution, including the input `5` and the resulting array values and their memory addresses.

```
C Bai2.c > main()
4 int main(){
5     do{
6         printf("Nhap so phan tu n = "); scanf("%d", &n);
7     }while(n<=0 || n>16);
8     printf("Khoi tao mang int arr[%d]\n",n);
9     // int a[n];
10    // uint8_t a[n];
11    // uint16_t a[n];
12    uint32_t a[n];
13    //uint64_t a[n];
14    for (int i=0; i<n; i++){
15        printf("arr[%d] = ",i);scanf("%d",&a[i]);
```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

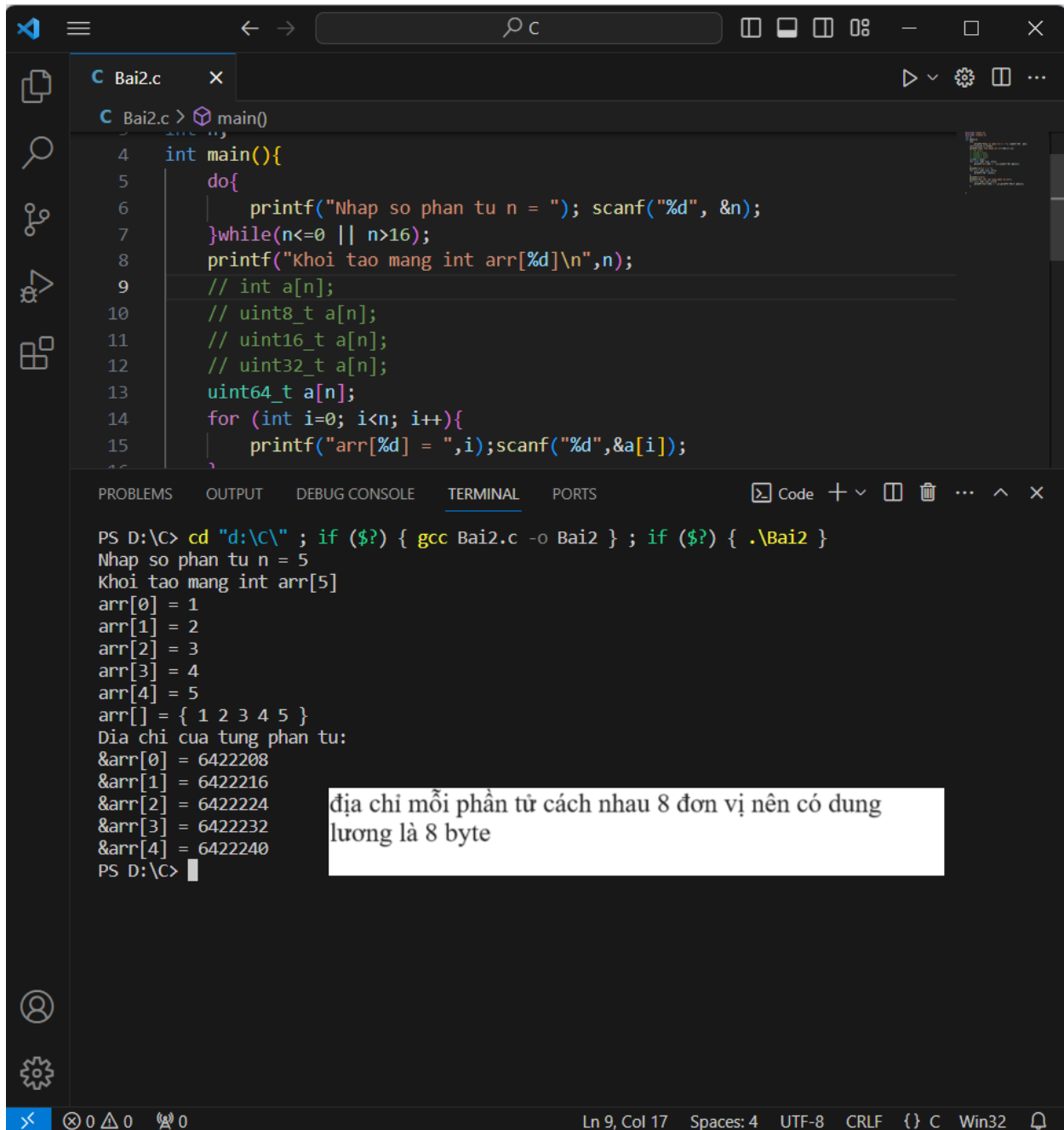
```
PS D:\C> cd "d:\C\" ; if ($?) { gcc Bai2.c -o Bai2 } ; if ($?) { .\Bai2 }
Nhap so phan tu n = 5
Khoi tao mang int arr[5]
arr[0] = 1
arr[1] = 2
arr[2] = 3
arr[3] = 4
arr[4] = 5
arr[] = { 1 2 3 4 5 }
Dia chi cua tung phan tu:
&arr[0] = 6422216
&arr[1] = 6422220
&arr[2] = 6422224
&arr[3] = 6422228
&arr[4] = 6422232
PS D:\C>
```

địa chỉ mỗi phần tử cách nhau 4 đơn vị nên dung lượng là 4 byte

Ln 11, Col 22 Spaces: 4 UTF-8 CRLF {} C Win32

## Bài 2

### Kiểu uint64\_t



The image shows a Visual Studio Code editor window with a C program named `Bai2.c` and its execution output in the terminal.

**Code in `Bai2.c`:**

```
1 // ...  
2  
3  
4 int main(){  
5     do{  
6         printf("Nhap so phan tu n = "); scanf("%d", &n);  
7     }while(n<=0 || n>16);  
8     printf("Khoi tao mang int arr[%d]\n",n);  
9     // int a[n];  
10    // uint8_t a[n];  
11    // uint16_t a[n];  
12    // uint32_t a[n];  
13    uint64_t a[n];  
14    for (int i=0; i<n; i++){  
15        printf("arr[%d] = ",i);scanf("%d",&a[i]);  
16    }
```

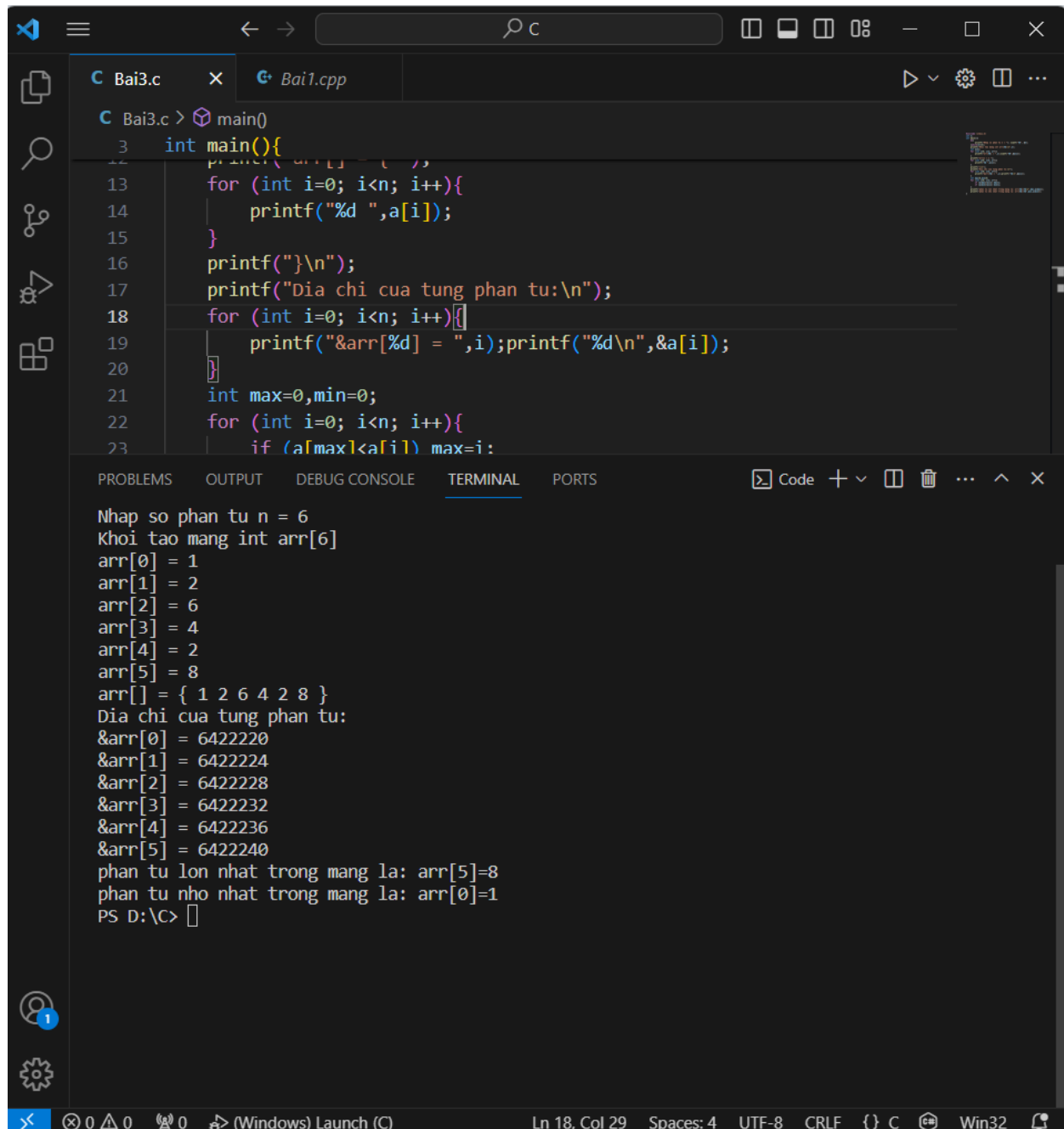
**Terminal Output:**

```
PS D:\C> cd "d:\C\" ; if ($?) { gcc Bai2.c -o Bai2 } ; if ($?) { .\Bai2 }  
Nhap so phan tu n = 5  
Khoi tao mang int arr[5]  
arr[0] = 1  
arr[1] = 2  
arr[2] = 3  
arr[3] = 4  
arr[4] = 5  
arr[] = { 1 2 3 4 5 }  
Dia chi cua tung phan tu:  
&arr[0] = 6422208  
&arr[1] = 6422216  
&arr[2] = 6422224  
&arr[3] = 6422232  
&arr[4] = 6422240  
PS D:\C>
```

A white text box is overlaid on the terminal output, containing the text: địa chỉ mỗi phần tử cách nhau 8 đơn vị nên có dung lượng là 8 byte

The status bar at the bottom of the editor shows: Ln 9, Col 17 Spaces: 4 UTF-8 CRLF {} C Win32

### Bài 3



The image shows a Visual Studio Code editor window with a C program in `Bai3.c` and its execution output in the terminal.

**Code in `Bai3.c`:**

```
1  int main()
2  {
3      printf("Nhap so phan tu n = ");
4      int n;
5      scanf("%d", &n);
6      int arr[n];
7      printf("Khoi tao mang int arr[%d]\n", n);
8      for (int i=0; i<n; i++){
9          arr[i] = 0;
10     }
11     printf("Dia chi cua tung phan tu:\n");
12     for (int i=0; i<n; i++){
13         printf("&arr[%d] = ", i); printf("%d\n", &arr[i]);
14     }
15     int max=0, min=0;
16     for (int i=0; i<n; i++){
17         if (arr[max]<arr[i]) max=i;
18     }
19     printf("phan tu lon nhat trong mang la: arr[%d]=%d\n", max, arr[max]);
20     min = 0;
21     for (int i=0; i<n; i++){
22         if (arr[min]>arr[i]) min=i;
23     }
24     printf("phan tu nho nhat trong mang la: arr[%d]=%d\n", min, arr[min]);
25     return 0;
26 }
```

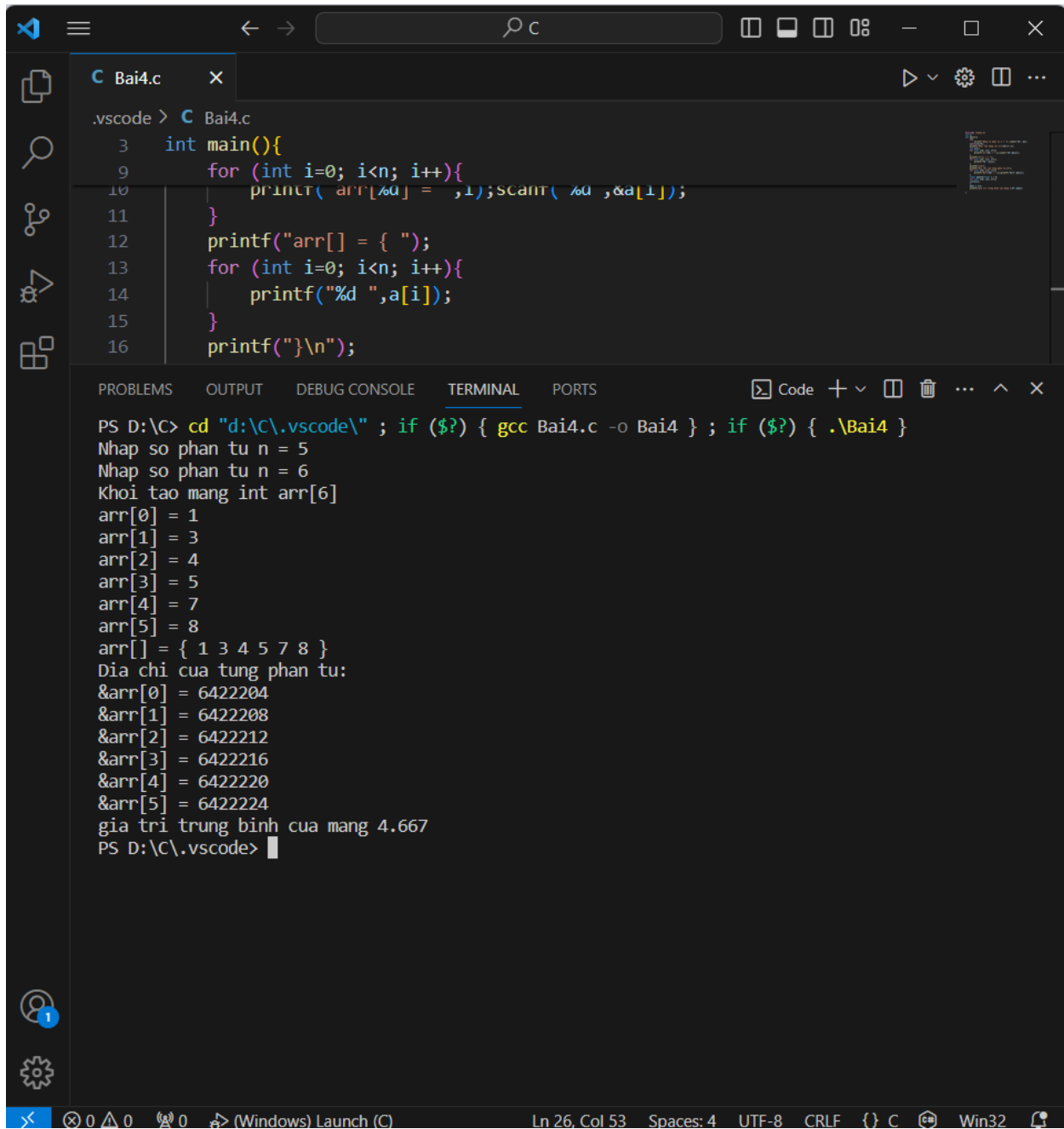
**Terminal Output:**

```
Nhap so phan tu n = 6
Khoi tao mang int arr[6]
arr[0] = 1
arr[1] = 2
arr[2] = 6
arr[3] = 4
arr[4] = 2
arr[5] = 8
arr[] = { 1 2 6 4 2 8 }
Dia chi cua tung phan tu:
&arr[0] = 6422220
&arr[1] = 6422224
&arr[2] = 6422228
&arr[3] = 6422232
&arr[4] = 6422236
&arr[5] = 6422240
phan tu lon nhat trong mang la: arr[5]=8
phan tu nho nhat trong mang la: arr[0]=1
PS D:\C>
```

The status bar at the bottom indicates the file is `Bai3.c`, the cursor is at line 18, column 29, and the encoding is UTF-8.



## Bài 4



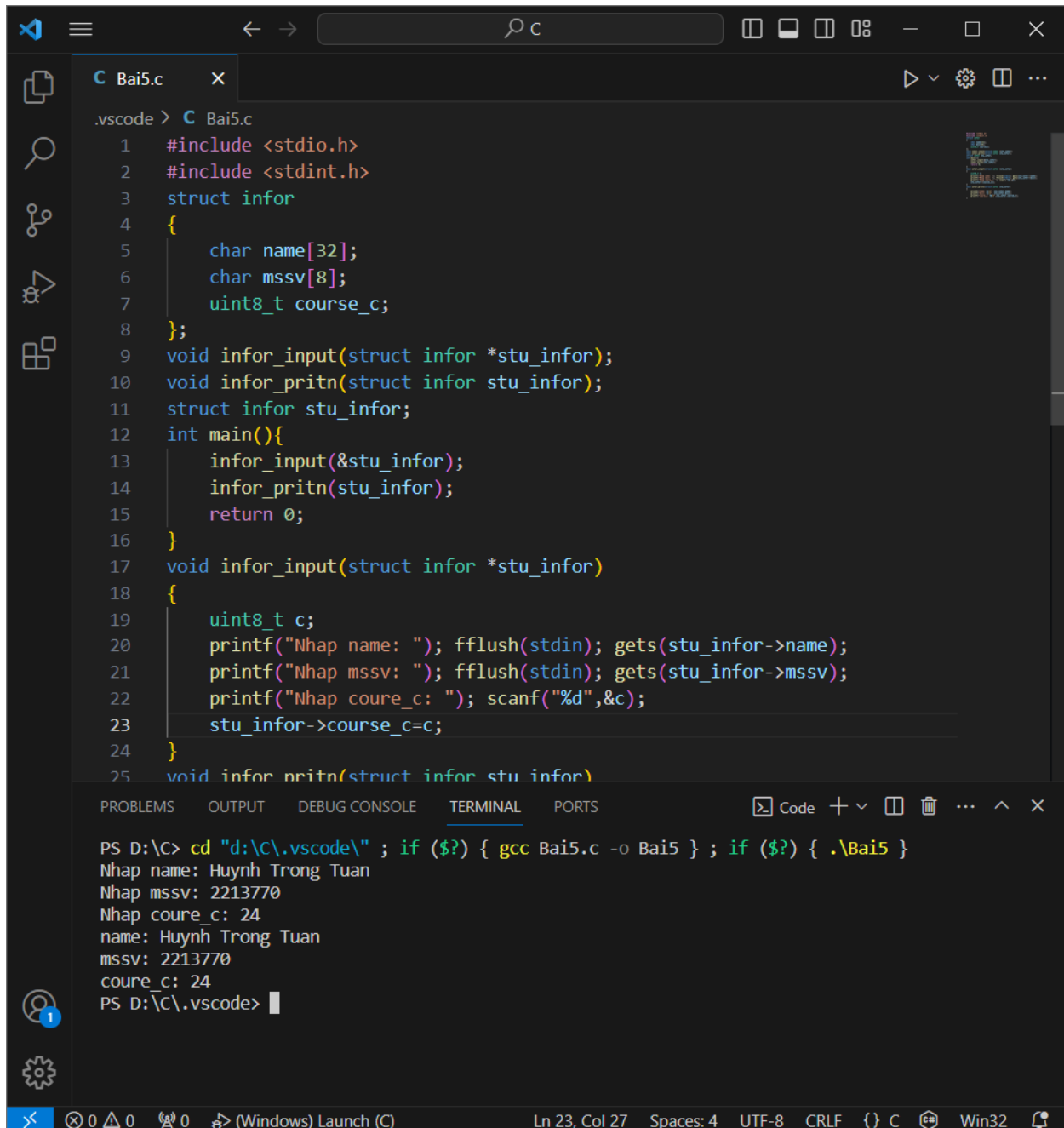
The image shows a Visual Studio Code window with a C file named `Bai4.c` open. The code defines a `main` function that takes an integer `n` as input, reads `n` values into an array `arr`, and prints the array elements and their average.

```
3 int main(){
9     for (int i=0; i<n; i++){
10        printf("arr[%d] = ", i); scanf("%d", &a[i]);
11    }
12    printf("arr[] = { ");
13    for (int i=0; i<n; i++){
14        printf("%d ", a[i]);
15    }
16    printf("}\n");
```

The terminal output shows the program's execution. It prompts for `n` (5 and 6), reads the array elements, and prints the array and its average (4.667).

```
PS D:\C> cd "d:\C\.vscode\" ; if ($?) { gcc Bai4.c -o Bai4 } ; if ($?) { .\Bai4 }
Nhap so phan tu n = 5
Nhap so phan tu n = 6
Khoi tao mang int arr[6]
arr[0] = 1
arr[1] = 3
arr[2] = 4
arr[3] = 5
arr[4] = 7
arr[5] = 8
arr[] = { 1 3 4 5 7 8 }
Dia chi cua tung phan tu:
&arr[0] = 6422204
&arr[1] = 6422208
&arr[2] = 6422212
&arr[3] = 6422216
&arr[4] = 6422220
&arr[5] = 6422224
gia tri trung binh cua mang 4.667
PS D:\C\.vscode>
```

## Bài 5



The image shows a Visual Studio Code editor window with a C program named `Bai5.c`. The program defines a `struct infor` with fields `name`, `mssv`, and `course_c`. It includes functions `infor_input` and `infor_pritn` to handle user input and output. The `main` function calls these functions to collect student information.

```
.vscode > C Bai5.c
1  #include <stdio.h>
2  #include <stdint.h>
3  struct infor
4  {
5      char name[32];
6      char mssv[8];
7      uint8_t course_c;
8  };
9  void infor_input(struct infor *stu_infor);
10 void infor_pritn(struct infor stu_infor);
11 struct infor stu_infor;
12 int main(){
13     infor_input(&stu_infor);
14     infor_pritn(stu_infor);
15     return 0;
16 }
17 void infor_input(struct infor *stu_infor)
18 {
19     uint8_t c;
20     printf("Nhap name: "); fflush(stdin); gets(stu_infor->name);
21     printf("Nhap mssv: "); fflush(stdin); gets(stu_infor->mssv);
22     printf("Nhap coure_c: "); scanf("%d",&c);
23     stu_infor->course_c=c;
24 }
25 void infor_pritn(struct infor stu_infor)
```

The terminal output shows the program's execution, where the user enters the name "Huynh Trong Tuan", the student ID "2213770", and the course number "24". The program then prints the collected information.

```
PS D:\C> cd "d:\C\.vscode\" ; if ($?) { gcc Bai5.c -o Bai5 } ; if ($?) { .\Bai5 }
Nhap name: Huynh Trong Tuan
Nhap mssv: 2213770
Nhap coure_c: 24
name: Huynh Trong Tuan
mssv: 2213770
coure_c: 24
PS D:\C\.vscode>
```

3.3

3.4

