C++ Programming

Structures 1

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Recall the employee system

- Each Employee has
  - Name
  - Age
  - Salary
  - Gender
- So we defined 4 arrays
- In practice, this is hard to maintain
  - e.g. got new features: email address - home address
- C++ offers us a convenient way to solve this problem!

```
const int MAX = 10000;

string names[MAX];
int ages[MAX];
double salaries[MAX];
char genders[MAX];
int added = 0;  // Number of employees
```

Define a struct

- Define a struct (e.g. data type)
- Add all elements inside it
- Create instance or array of it!
- Now, employee can change smoothly
- Also we defined 1 array only!

14_1.cpp

```cpp
#include <iostream>
using namespace std;


struct emplyee
{
    string name;
    int age;
    double salary;
    char gender;
};

const int MAX = 10000;

emplyee emplyees_arr[MAX];
int added = 0;  // Number of employees

int main() {
    return 0;
}
```

Creating elements

- In code, 2 ways to create instance
- Notice the dot to get elements!
- In IDE, right click + space
  - Given menu of choices!

Reading & Writing

- Notice everything is now as we used to do
- You just access the variable using ‘.’ operator

```
void read_employee() {
    cout<<"Enter employee 4 entries: ";
    cin >> emplyees_arr[added].name >> emplyees_arr[added].age;
    cin >> emplyees_arr[added].salary >> emplyees_arr[added].gender;
    added++;
}

void print_employees() {
    for (int i = 0; i < added; ++i) {
        emplyee e = emplyees_arr[i];
        cout << e.name << " has salary " << e.salary << "\n";
    }
}
```

Reading & Writing - Another way

```
16 void read_employee(emplyee & e) {
17     cout << "Enter employee 4 entries: ";
18     cin >> e.name >> e.age;
19     cin >> e.salary >> e.gender;
20 }
21
22 void print_employee(emplyee & e) {
23     cout << e.name << " has salary " << e.salary << "\n";
24 }
25 void print_employees() {
26     for (int i = 0; i < added; ++i)
27         print_employee(emplyees_arr[i]);
28 }
29
30 int main() {
31     read_employee(emplyees_arr[added++]);
32     read_employee(emplyees_arr[added++]);
33     print_employees();
34     return 0;
35 }
```

Problems Tasks Console Properties Call Graph Se

```
<terminated> ztemp [C/C++ Application] /home/moustafa/workspaces/ec
Enter employee 4 entries: most 10 20 M
Enter employee 4 entries: asmaa 30 40 F
most has salary 20
asmaa has salary 40
```

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."