

Ahmad Ali Ahmad Othman - Section 1 - Sheet 6

Question (1)

Question (1-a)

Write a program to print the value of the address of the pointer to a variable whose value is input from user.

```
#include <iostream>

using namespace std;

int main() {
    int x;
    int *ptr;

    cin >> x;
    ptr = &x;

    printf("Value: %d, Address: %p\n", *ptr, ptr);
    return 0;
}
```

Question (1-b)

Write a program to print a number which is entered from keyboard using pointer.

```
#include <iostream>

using namespace std;

int main() {
    int x;
    int *ptr;

    cin >> x;
    ptr = &x;

    cout << *ptr << endl;
    return 0;
}
```

Question (1-c)

Write a function which will take pointer and display the number on screen. Take number from user and print it on screen using that function.

```
#include <iostream>

using namespace std;

void printPtr(int *ptr) {
    cout << *ptr << endl;
}

int main() {
    int x; cin >> x;

    printPtr(&x);
    return 0;
}
```

Question (1-d)

Write a program that asks the user to enter integers as inputs to be stored in the variables `a` and `b` respectively.

There are also two integer pointers named `ptrA` and `ptrB`.

Assign the values of `a` and `b` to `ptrA` and `ptrB` respectively, and display them and print the after swapping two value.

```
#include <iostream>

using namespace std;

int main() {
    int a, b; cin >> a >> b;
    int *ptrA = &a, *ptrB = &b;

    cout << "Before swap:" << endl;
    printf("ptrA: %d, ptrB: %d\n", *ptrA, *ptrB);

    int temp = *ptrA;
    *ptrA = *ptrB;
    *ptrB = temp;

    cout << "After swap:" << endl;
    printf("ptrA: %d, ptrB: %d\n", *ptrA, *ptrB);

    return 0;
}
```

Question (2)

Question (2-a)

Given the string "A string." Print on one line the letter on the index 0, the pointer position and the letter t. update the pointer to pointer +2. Then, in another line print the pointer and the letters r and g of the string (using the pointer).

```
#include <iostream>
#include <string>

using namespace std;

int main() {
    char str[] = "A string";
    char *ptr = str;

    printf("%c %p %c\n", *ptr, ptr, ptr[3]);
    return 0;
}
```

Question (2-b)

Find max element in array using pointer

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

int main() {
    int n;
    cin >> n;

    int arr[100];
    for (int i = 0; i < n; i++) {
        cin >> arr[i];
    }

    int *maxPtr = arr;

    for (int i = 1; i < n; i++) {
        if (*(arr + i) > *maxPtr) {
            maxPtr = arr + i;
        }
    }

    cout << "Max value = " << *maxPtr << endl;
    cout << "Address = " << maxPtr << endl;

    return 0;
}
```

Question (2-c)

Print size of different data types using pointers

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

int main() {
    int a;
    float b;
    double c;
    char d;

    cout << sizeof(&a) << endl;
    cout << sizeof(&b) << endl;
    cout << sizeof(&c) << endl;
    cout << sizeof(&d) << endl;

    return 0;
}
```

Question (2-d)

Print and sum array elements using pointers

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

int main() {
    int n;
    cin >> n;

    int arr[100];
    for (int i = 0; i < n; i++) {
        cin >> arr[i];
    }

    int *p = arr;
    int sum = 0;

    for (int i = 0; i < n; i++) {
        cout << *(p + i) << " ";
        sum += *(p + i);
    }

    cout << endl;
    cout << "Sum = " << sum << endl;

    return 0;
}
```