

Lesson 8 Lab

Task 1: define a function to swap 2 integers and to return the bigger value, with inputs as two pointers to integer

```
int swap (int* x, int* y);
```

Usage :

```
int main(void) {  
    int m = 22, n = 11;  
    printf("%d", swap (&m, &n)); /*should print 22*/  
    printf("%d", m);             /*should print 11*/  
}
```

```
int swap(int *m, int *n)  
{  
    int tmp = *m;  
    *m = *n;  
    *n = tmp;  
  
    return *m > *n ? *m : *n;  
}
```

Task 2: define a function to find and bring back both min and max through input points

```
void max_min( int x, int y, int* pmin, int* pmax);
```

```
void max_min(int x, int y, int* pmin, int* pmax)  
{  
    if (x > y)  
    {  
        *pmax = x;  
        *pmin = y;  
        return;  
    }  
    *pmax = y;  
    *pmin = x;  
}
```

Exercise (not for marks): Create an appropriate declaration for each of the following variables:

a) `digits` is an array of 10 `integers`.

```
int digits[10];
```

b) `mat` is an array of three arrays of five `integers`.

```
int mat[3][5];
```

c) `psa` is an array of 10 pointers to `char`.

```
char *psa[10];
```

d) `pstr` is a pointer to an array of 10 `chars`.

```
char (*pstr)[10];
```

Task 3: To identify what are the listed declarations

(1) `float *(*p) [4];`

P is a pointer to an array of 4 pointers to floats

(2) `double *p[4][4];`

P is an array of 4 pointer to floats of 4 floats

(3) `int *(*p[4]) [4];`

P is an array of 4 pointers to arrays of 4 pointers to int

(4) `void *(p[4]) [4];`

P is an array of 4 pointers to arrays of 4 pointers to void

Task 4: to identify what are the listed declarations

(1) `double (*p) (int, double*);`

P is a pointer to a function that takes an int and a pointer to double

(2) `double *(*p) (int, double*);`

P is a pointer a function that takes an int and a pointer to double and returns a pointer to double

(3) `double (*(p)[3]) (int, double*);`

P is a pointer to an array of 3 pointers to a function that takes an int and pointer to double

(4) `double (*p[3]) (int, double*);`

P is an array of 3 pointers to a function that takes an int and a pointer to double

Task 5: What's the output for each question

```
#include <stdio.h>

int main()
{
    int m = 11, n =22;
    int *p = &m;
    int *q = &n;
    *p = *q + 1;
    p = q;
    *p = *q + 3;
    printf("%d %d", *p, *q);

    return 0;
}
```

Your answer:

25 25

Your answer:

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    int m = 11, n = 22;
```

```
    int *p = &m;
```

```
    int *q = &n;
```

```
    *p = *q + 1;
```

```
    *q = *p - 2;
```

```
    printf("%d %d", *p, *q);
```

```
    return 0;
```

```
}
```

23 21