Recitation 5 Exercise

From Xiao Liu

Exercise 1

Read the following code segments. Tell whether it can compile or not, if can, what's the output?

Exercise 1.1

```c
#include <stdio.h>

int main(void){
  n += 5;
  printf("%d\n", n);

  return 0;
}
```

Exercise 1.2

```c
#include <stdio.h>

int n = 0;

int main(void) {
  n += 5;
  printf("%d\n", n);

  return 0;
}
```

Exercise 1.3

```c
#include <stdio.h>

int n = 0;

int main(void) {
  int n;
  n += 5;

  printf("%d\n", n);

  return 0;
}
```

Exercise 1.4

```c
#include <stdio.h>

int n = 0;

int main(void){
  int n = 1;

  n += 5;
  printf("%d\n", n);

  return 0;
}
```

Exercise 1.5

```c
#include <stdio.h>

int n = 0;

int main(void) {
  extern int n;

  n += 5;
  printf("%d\n", n);

  return 0;
}
```

Exercise 1.6

```c
#include <stdio.h>

int total(int x) {
  static int total = 0;

  total += x;
  return total;
}

int main(void) {
  total(5);
  total(10);
  printf("%d\n", total(15));
  return 0;
}
```

Exercise 1.7

`library.h`:

```
#ifndef LIBRARY_H
#define LIBRARY_H

int net_price(int price, int discount);
static int validate(int n);

#endif
```

`driver.c`:

```
#include "library.h"
int main(void) {
  int i, j;
  i = validate(-5);
  j = net_price(6, 2);
}
```

`library.c`:

```
#include "library.h"

int net_price(int price, int discount) {
  return validate(price - discount);
}

static int validate(int n) {
  if (n < 0)
    return 0;
  else
    return n;
}
```

Exercise 2

Identify whether the header files and source files can separately be compiled. If can, can they link together?

Exercise 2.1

`account.h`:

```
#ifndef ACCOUNT_H
#define ACCOUNT_H

#define ACCT_OK       0
#define ACCT_INVALID 1
#define ACCT_CLOSED  2

int acct_status;

#endif
```

`account.c`:

```
#include "account.h"

// Use acct_status
```

`driver.c`:

```
#include "account.h"

// Use acct_status
```

Exercise 2.2

`account.h`:

```
#ifndef ACCOUNT_H
#define ACCOUNT_H

#define ACCT_OK      0
#define ACCT_INVALID 1
#define ACCT_CLOSED  2

// Don't define acct_status
// since that caused the problem

#endif
```

`account.c`:

```
#include "account.h"

// Use acct_status
```

`driver.c`:

```
#include "account.h"

// Use acct_status
```

Exercise 2.3

`account.h`:

```
#ifndef ACCOUNT_H
#define ACCOUNT_H

#define ACCT_OK      0
#define ACCT_INVALID 1
#define ACCT_CLOSED  2

// Don't define acct_status

#endif
```

`account.c`:

```
#include "account.h"

int acct_status;

// Use acct_status
```

`driver.c`:

```
#include "account.h"

// Use acct_status
```

Exercise 2.4

`account.h`:

```
#ifndef ACCOUNT_H
#define ACCOUNT_H

#define ACCT_OK       0
#define ACCT_INVALID 1
#define ACCT_CLOSED  2

extern int acct_status;

#endif
```

`account.c`:

```
#include "account.h"

// Use acct_status
```

`driver.c`:

```
#include "account.h"

// Use acct_status
```

Exercise 2.5

`account.h`:

```
#ifndef ACCOUNT_H
#define ACCOUNT_H

#define ACCT_OK      0
#define ACCT_INVALID 1
#define ACCT_CLOSED  2

extern int acct_status;

#endif
```

`account.c`:

```
#include "account.h"

int acct_status = ACCT_OK;

// Use acct_status
```

`driver.c`:

```
#include "account.h"

// Use acct_status
```

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