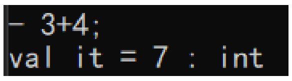
Mission 1

1)

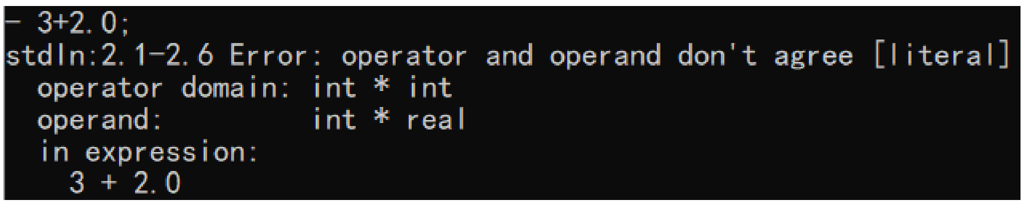
```
3 + 4;
(* val it = 7 *)
```



```
- 3+4;
val it = 7 : int
```

2)

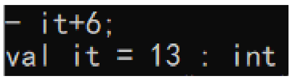
```
3 + 2.0;

(* 错误，real 和 int 类型不匹配，改成 3.0 + 2.0 *)
```



```
- 3+2.0;
stdIn:2.1-2.6 Error: operator and operand don't agree [literal]
  operator domain: int * int
  operand:         int * real
  in expression:
    3 + 2.0
```

3)

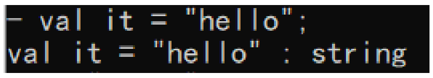
```
it + 6;
(* val it = 13 *)
```



```
- it+6;
val it = 13 : int
```

4)

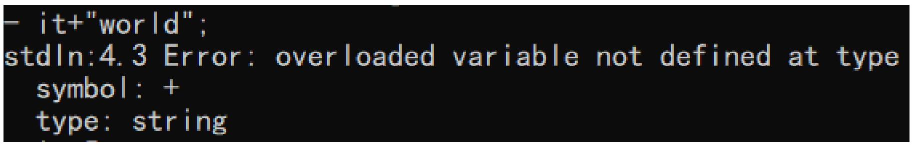
```
val it = "hello";
(* val it = "hello" *)
```



```
- val it = "hello";
val it = "hello" : string
```

5)

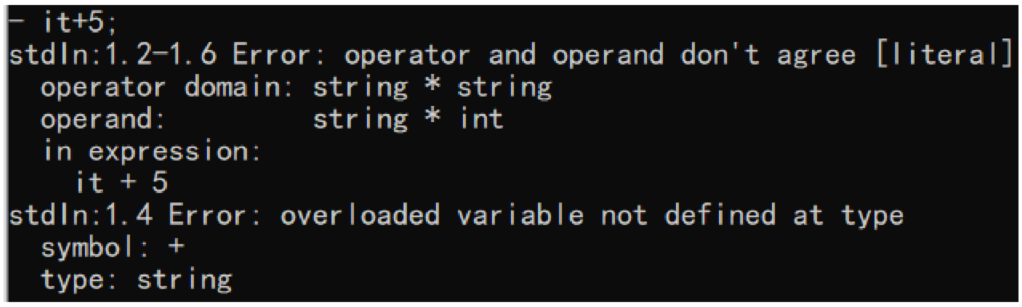
```
it + "world";
(* 错误，字符串类型没有+操作符，要用^操作符拼接*)
```



```
- it+"world";
stdIn:4.3 Error: overloaded variable not defined at type
  symbol: +
  type: string
```

6)

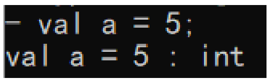
```
it + 5;
(* 错误，string 和 int 类型不匹配 *)
```



```
- it+5;
stdIn:1.2-1.6 Error: operator and operand don't agree [literal]
  operator domain: string * string
  operand:         string * int
  in expression:
    it + 5
stdIn:1.4 Error: overloaded variable not defined at type
  symbol: +
  type: string
```

7)

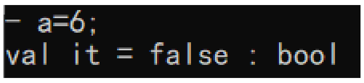
```
val a = 5;
(* val a = 5 *)
```



```
- val a = 5;
val a = 5 : int
```

8)

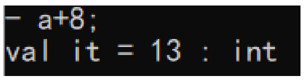
```
a = 6;
(* val it = false *)
```



```
- a=6;
val it = false : bool
```

9)

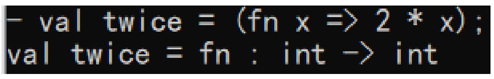
```
a + 8;
(* val a = 13 *)
```



```
- a+8;
val it = 13 : int
```

10)

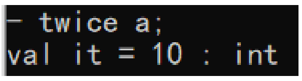
```
val twice = (fn x => 2 * x);
(* val twice = fn : int -> int *)
```



```
- val twice = (fn x => 2 * x);
val twice = fn : int -> int
```

11)

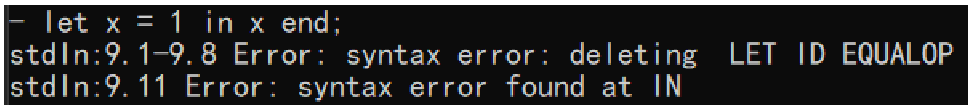
```
twice a;
(* val it = 10 *)
```



```
- twice a;
val it = 10 : int
```

12)

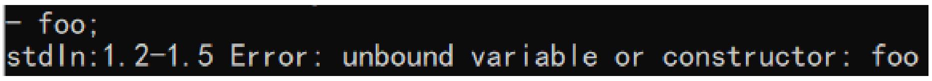
```
let x = 1 in x end;
(* 错误，x=1 是 bool 值，给 x 赋值要用 val x = 1 *)
```



```
- let x = 1 in x end;
stdIn:9.1-9.8 Error: syntax error: deleting  LET ID EQUALOP
stdIn:9.11 Error: syntax error found at IN
```

13)

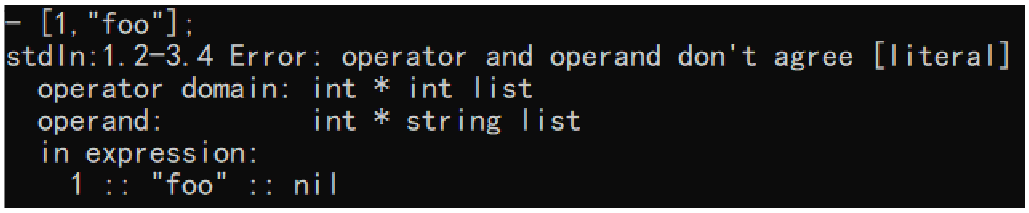
```
foo;
(* 错误，foo 未绑定 *)
```



```
- foo;
stdIn:1.2-1.5 Error: unbound variable or constructor: foo
```

14)

```
[1,"foo"];
(* 错误，list 里面不能包含不同类型的成员 *)
```



```
- [1,"foo"];
stdIn:1.2-3.4 Error: operator and operand don't agree [literal]
  operator domain: int * int list
  operand:         int * string list
  in expression:
    1 :: "foo" :: nil
```

Mission 2

```
(* mult : int list -> int *)
(* REQUIRES: true *)
(* ENSURES: mult(L) evaluates to the product of the
 integers in L. *)
fun mult [] = 1
     | mult(x::L) = x * (mult L);
```

Mission 3

```
(* Mult : int list list -> int *)
(* REQUIRES: true *)
(* ENSURES: Mult(R) evaluates to the product of all
 the integers in the lists of R. *)
fun Mult [] = 1
     | Mult(r::R) = (mult r)*(Mult R);
```

Mission 4

```
(* mult' : int list * int -> int *)
(* REQUIRES: true *)
(* ENSURES: mult'(L) evaluates to the product of th
e integers in L and a. *)
fun mult' ([],a) = a
    | mult' (x::L,a) = mult'(L,x*a);
```

Mission 5

```
(* double : int -> int *)
(* REQUIRES: n>=0 *)
(* ENSURES: double n evaluates to 2*n. *)
fun double (0:int):int = 0
    | double n = 2 + double(n-1);

(* square : int -> int *)
(* REQUIRES: n>=0 *)
(* ENSURES: square n evaluates to n*n. *)
fun square (0:int):int = 0
    | square (1:int):int = 1
    | square n = double(n) + double(n-
2) + square(n-2);
```

Mission 6

```
(* divisibleByThree : int -> bool *)
(* REQUIRES: true *)
(* ENSURES: divisibleByThree n evaluates to true if
 n is a multiple of 3 and to false otherwise *)
fun divisibleByThree (n:int):bool =
    n = (n div 3) * 3;
```

Mission 7

```
(* oddP : int -> bool *)
(* REQUIRES: n>=0 *)
(* ENSURES: oddP n evaluates to true if n is odd *)
fun oddP (0:int):bool = false
      | oddP 1 = true
      | oddP n = oddP(n-2);
```

CS1701-熊逸钦-U201714501