

## 課題5.1

```
let rec summation f m =
  if m = 0 then f(m)
  else f(m) + summation f (m - 1);;
summation (fun x -> 2 * x) 3;;
```

## 実行結果

```
val summation : (int -> int) -> int -> int = <fun>
- : int = 12
```

## 課題5.2

```
let rec qsort pred l =
  match l with
  [] -> []
  | b::bs ->
    let rec split l =
      match l with
      [] -> ([], [])
      | x::xs ->
        let (l1, l2) = split xs in
        if pred(x, b) then (x::l1, l2) else (l1, x::l2) in
      let (l1, l2) = split bs in
      qsort pred l1@b::qsort pred l2;;
  qsort (fun (x, b) -> x <= b) [4;2;5;3];;
  qsort (fun (x, b) -> b <= x) [4;2;5;3];;
```

## 実行結果

```
val qsort : ('a * 'a -> bool) -> 'a list -> 'a list = <fun>
- : int list = [2; 3; 4; 5]
- : int list = [5; 4; 3; 2]
```

## 課題5.3

1

```
let rec inter s1 s2 =
  match s1 with
  [] -> []
  | b::bs -> (List.filter (fun x -> x = b) s2) @ inter bs s2;;
inter [3;1;2] [2;3];;
```

## 実行結果

```
val inter : 'a list -> 'a list -> 'a list = <fun>
- : int list = [3; 2]
```

2

```
let pair v s =
  List.map (fun x -> (v, x)) s;;
pair 1 ["A";"B";"C"];;
```

## 実行結果

```
val pair : 'a -> 'b list -> ('a * 'b) list = <fun>
- : (int * string) list = [(1, "A"); (1, "B"); (1, "C")]
```

3

```
let rec prod s1 s2 =
  match s1 with
  [] -> []
  | b::bs -> pair b s2 @ prod bs s2;;
prod [1;2;3] ["A";"B"];;
```

## 実行結果

```
val prod : 'a list -> 'b list -> ('a * 'b) list = <fun>
- : (int * string) list = [(1, "A"); (1, "B"); (2, "A"); (2, "B"); (3, "A"); (3, "B")]
```