Problem 1: Dot Product

The dot product of two vectors, u and v, is $\sum_i u_i * v_i$.

Examples

Write two examples of the operation of dot-product.

Implementation

Write a function **dot-product** that computes the dot-product of two vectors.

```
(define (dot-product u v)
;; dot-product: (vectorof number) (vectorof number) -> number
```

Test

Demonstrate the operation of your function on the examples you defined above.

Problem2: Changeable Phonebook

Assume a variant of the phonebook in Homework 6, where instead of a list of structures, the phonebook is represented as a vector of structures as below.

A phone-book is a vector of length 100 where entries are either:

- #f, or
- (make-pb name number)

  (define-struct pb (name number)), where *name* is a symbol and *number* is a number)

new-phonebook

Based on the definition above, create a new phonebook where all the entries are #f.

add-phonebook

Create a new function **add-phonebook** that inserts new phonebook entry - name and number - into the phonebook created above. If an entry already exists for a given name, do nothing.

```
(define (add-phonebook name number)
;; add-phonebook: symbol number -> (void)
```

update-phonebook

Implement a new function **update-phonebook** that takes a name and number and updates the associated phonebook entry if there is one, and returns #f, otherwise.

```
(define (update-phonebook name number)
;; add-phonebook: symbol number -> (void) or \#f
```