CS142 **Assignment 9** Spring 2025

Given: Fri, Apr 4
Due: Thu, Apr 10, 3:00 p.m.

1. (60%)

   (a) Define a type of map that stores a collection of songs. Each song has a title, an artist and a recording year. The title and artist are strings and both can consist of multiple words. The year is an integer. The titles of the songs should be used as keys. Use a type alias (**`using`**) to give this type of map the name `SongMap`. Define any other types you may need. You can use your class `Song` from earlier assignments, if you want.

   (b) Suppose that a file contains the titles, artists and recording years of a collection of songs. The data for each song is given on three consecutive lines, as follows:

```
Title
Artist
Recording year
```

   Create a function `read_songs(m, file_name)` that reads a song file and stores all the songs in map `m`. The argument `m` is a `SongMap` and the argument `file_name` is a C++ string.

   (c) Create a function `print_recent(m, year)` that prints to standard output the titles of all the songs in `m` that were recorded since

the given year. The argument `m` is a `SongMap` and the argument `year` is an integer.

2. (40%) Create a generic function

```
T* subarray(const T* a, int i, int m)
```

that returns a copy of the portion of `a` that starts at index `i` and is of length `m`. More precisely, the function returns a new dynamically allocated array of length `m` that contains a copy of elements `a[i]` through `a[i+m-1]`. The function assumes that `m` is not too large, in the sense that `i+m-1` is no greater than the last index of `a`.