

Homework Description

In this homework assignment, you will use one programming language to answer the given questions. You can use the programming language that you used in HW 1. Or you can choose a different programming language in the following list.

List of Programming Languages

- Go (<https://golang.org/>)
- Dart (<https://dart.dev/>)
- Pony (<https://www.ponylang.io/>)
- TypeScript (<https://www.typescriptlang.org/>)
- Kotlin (<https://kotlinlang.org/>)
- Nim (<https://nim-lang.org/>)
- Rust (<https://www.rust-lang.org/>)
- Julia (<https://julialang.org/>)
- Swift (<https://swift.org/>)
- Crystal (<https://crystal-lang.org/>)

List of Homework Questions

Using the chosen language, answer the below questions. You can type answers on a separate word document. Or you can write answers on a separate blank paper and scan it. In either way, do not forget to include your name.

1. Which language did you choose?

I chose Go language programming because it's programming language that makes it easy to build simple, reliable, and efficient software

2. Describe characteristics of static type checking regarding type checking process and variable type.

*Go static type checking comparable to that done by a compiler: it perceives formed programs, resolutions each identifier to the entity it symbolizes, calculates the type of each expression and the technique set of each type, and controls which types are transferrable to each interface type. Type analysis is comparatively speedy, demanding around Ten seconds for the grater than two hundred packages of the normal library: **Compiler errors, Identifier resolution, and Type information: size/alignment, method set, interfaces***

*Go variable type is a placeholder of the evidence which can be transformed at runtime. And variables permit to Re-claim and handle the kept information. Than we know that Go has three ways to find the type of variables in Go as follows: **Using reflect.TypeOf Function, Using reflect.ValueOf.Kind() Function and Using %T with Printf***

3 Describe characteristics of dynamic type checking regarding type checking process and variable type.

Dynamic type checking is the procedure of confirming the type protection of a program at runtime. Mutual dynamically typed languages include Groovy, JavaScript, Lisp, Lua, Objective-C, PHP, Prolog, Python, Ruby, Smalltalk and Tcl.

4. Is your language statically typed? If yes, show that your language has the characteristics described in question 2. If no, skip this question. Feel free to write (or copy) programs with their results in your answer to show the characteristics. (Remember what kind of examples were used to show characteristics of static type checking in the class.)

Go is a powerfully, statically typed language. There are aboriginal types like int, byte, and string. There are also structs. Similar any powerfully typed language, the type system allows the compiler helps catch entire classes of bugs. The Go programming language is an open source project to make computer programmer more productive.

*Statically type checkers like **Flow** and **TypeScript** recognize convinced types of difficulties beforehand you even run your code. They can also develop inventor workflow by calculation features similar auto-achievement; for example:*

```
package main

import "fmt"

func main() {

    // Print string in English, Chinese and Thai

    fmt.Println ("Hello Mars!", "你好火星", "สวัสดีดาวอังคาร")
```

5. Is your language dynamically typed? If yes, show that your language has the characteristics described in question 3. If no, skip this question. Feel free to write (or copy) programs with their results in your answer to show the characteristics. (Remember what kind of examples were used to show characteristics of dynamic type checking in the class.)

No, Go, or Golang, is an open source user interface design language. It's statically typed and produces compiled machine code binaries.

*In a dynamic typed language, you shouldn't have to initialize variables, which is a gigantic advantage designed for numerous inventors. Computer programmer similar the fact that you can use a variable at will when mandatory deprived of having to initialize it. **Dynamic typing** is characteristic of many of the scripting languages: **Perl, PHP, Python***

A dynamic type variables are demarcated using the dynamic keyword. Example: dynamic Variable. dynamic MyDynamicVar = 1; The compiler compiles dynamic types into object types in most cases

Example in C:

```
// Method which contains dynamic parameters

    public static void addstr(dynamic s1, dynamic s2)
    {
        Console.WriteLine(s1 + s2);
    }
```

6. Assume that we have a programming language A with the below description. Write any features of A that you can guess from the below description. You need to write at least three features of A to get a full point. A is statically typed language, and it has a built-in type-inference. When a program written in A has type-errors, the errors are handled with weak typing system.'

Meanwhile it is a statically typed language the data type of all the variables in the code can be strong-minded at compile time solitary.

A has a built-in type-interface so it can distinguish the type of all the terminologies that give the idea in the code

*A has a weak typing method therefore if a minor mistake like addition a **int** to a **char** occurs it will translate one type to another and handle the mistake.*

7. Explain briefly how duck typing works in functions of dynamically typed languages.

Duck typing is a word used in dynamic languages that do not have durable typing. The impression is that you don't essential used a type in order to invoke a present process or method on a purpose or object, if a process or method is demarcated on it, you can invoke it. The name comes from the phrase. "If it looks like a duck and quacks like a duck, it's a duck".

Bonus Question. Modify the duck test in a way that identifies computer science students (CS students) at BSU. Observe what kind of behaviors/characteristics specify CS students at BSU. Then, complete the below CS student test.

CS Student test

If it _____ *Object walks similar a duck* _____ and it _____ *quack comparable a duck* _____, then it must be a CS student at BSU.

(We will vote to elect the most creative CS student test. If your answer is selected as the first place, you will have 3pts as a bonus point. If your answer is selected as the second place, you will have 2pts as a bonus point. Otherwise, you will have 1pt as a bonus point.)

Duck typing is an experiment which conditions that "if a body or object walks similar a duck and quack comparable a duck, then it must be a duck". This is applicable in a perception named duck typing.

Consequently, to find an undergraduate from BSU you must try to come up with 2 exceptional functions or attributes associated with a student of BSU. Attempt to come up with something exceptional in the association, nevertheless, attempt to come up with something that is necessary for everyone in CS at your college and also uniquely identifies your college.

For example: if it be present at a computer science lecture at Bridgewater/"BSU" and is recorded in BSU, then it must be a CS student at BSU. If it codes and answers assignments at night and in morning studies at BSU, then it must be a CS student at BSU.

Submission Guideline

- You need to submit your assignment on Blackboard.
- If you directly type on a word document, submit it as pdf or docx.
- If you write answers on a blank paper, scan and submit it as a readable image file like pdf, jpg, or png.
- Do not forget to include your name.