

Q1 Multichoice Questions (1100 and 1130)

20 Points



Australian National University

COMP1100 Mid-Semester Quiz, Semester 2 2024

This file contains instructions for all COMP1100 students on how to participate in the midsemester quiz, and also contains the multiple choice questions. More detailed comments regarding the purpose of this quiz can be found in [these lecture slides](#).

There are eight multiple choice questions in this document, worth 2.5 marks each, for a total of 20 marks. Incorrect or missing answers earn 0 marks, without further mark penalty. Each question is intended to have one best answer.

Marks for multiple choice questions will be released when the quiz is closed on Sunday 25 August.

There are also five programming questions, worth 6 marks each, for a total of 30 marks. [Haskell files can be downloaded by clicking this link](#). These files contain complete information about the task required. Doctests are provided to help you write your code but are not necessarily comprehensive. You can submit these files to the [separate assignments on the Gradebook dashboard](#). Your code will immediately be run against our tests, which will not correspond to the provided doctests, and your mark out of 6 will be the number of tests passed. You may resubmit as often as you wish.

For the purpose of self assessment you can total your marks from each assessment to get a mark out of 50.

Q1.1 Programs**2.5 Points**

When we take a whole program and transform it into machine code, we say our program has been

- compiled
- interpreted
- mechanised
- run

Q1.2 Sets and Functions**2.5 Points**

Which of the following is a valid definition of a mathematical function f from the set $\{a, b, c\}$ to the set $\{1, 2\}$?

$$f(a) = 2, f(b) = 1$$

$$f(a) = 2, f(b) = 1, f(b) = 2$$

$$f(a) = 2, f(b) = 1, f(b) = 2, f(c) = 2$$

$$f(a) = 2, f(b) = 1, f(c) = 2$$

Q1.3 Sets and Functions**2.5 Points**

Which of these is a valid definition of a mathematical function g from $A \times B$ to $A + B$? Here A and B are any sets, a is any element of A , and b is any element of B .

$$g(a, b) = (a, left)$$

$$g(a, b) = (a, right)$$

$$g(a, left) = (a, b)$$

$$g(a, left) \text{ and } g(b, right) = g(a, b)$$

Save Answer

Q1.4 Types and Sets**2.5 Points**

The Haskell data type definition

```
data Foo = Bar Bool Bool | Baz Bool | Qux Bool
```

can be considered equivalent to the mathematical set (where \mathbb{B} is the two element set of Boolean values)

$$(\mathbb{B} + \mathbb{B}) \times \mathbb{B} \times \mathbb{B}$$

$$(\mathbb{B} \times \mathbb{B}) + \mathbb{B} + \mathbb{B}$$

$$\mathbb{B} + \mathbb{B} + \mathbb{B} + \mathbb{B}$$

$$\mathbb{B} \times \mathbb{B} \times \mathbb{B} \times \mathbb{B}$$

Save Answer

Q1.5 Lists**2.5 Points**The String `"BLUE"` can be equivalently written`'B' : ('L' : ('U' : ('E' : [])))``'B' : ('L' : ('U' : 'E'))``"B" : ("L" : ("U" : ("E" : [])))``"B" : ("L" : ("U" : "E"))`**Save Answer****Q1.6 Errors****2.5 Points**

Why does the code

```

mySignum :: Int -> Int
mySignum x
| x <= 0 = -1
| x == 0 = 0
| x > 0  = 1

```

produce the error

```

error: parse error on input '|'
|
| | x <= 0      = -1
| ^

```

Guards should end with an `otherwise`Missing `=` to the right of the line that reads `mySignum x`Missing space(s) to the left of the `|`This should be a `case` statement, which do not use `|`**Save Answer**

Q1.7 Recursion**2.5 Points**

How many times will the function `thud` run (including the first run, and the base case) if started with the input

```
[1.0, 2.0, 3.0, 4.0, 5.0]?
```

```
thud :: [Double] -> Double
thud list = case list of
  x:y:ys -> x + y + thud ys
  _       -> 0
```

3

4

5

Infinitely often (or until the computer runs out of memory)

Q1.8 Parametric Polymorphism**2.5 Points**

Suppose we have the parametric polymorphic type

```
a -> b -> a -> b
```

Which of these is a valid instantiation?

 `(Int, Int, Double) -> Double`
 `(Int, Double, Int) -> Double`
 `Int -> Int -> Double -> Double`
 `Int -> Double -> Int -> Double`