Quiz 02 - 03/14/24

Thank you. Your instructor has reviewed your responses. Here are your results.

Score Summary			
(Click on question number to jump to question.)		points earned	points possible
Question 1	correct	1	1
Question 2	correct	1	1
Question 3	correct	1	1
Question 4	correct	1	1
Question 5	correct	1	1
Question 6	correct	1	1
Question 7	correct	1	1
Question 8	correct	1	1
Question 9	correct	1	1
Question 10	correct	1	1
Question 11	correct	1	1
Question 12	correct	1	1
Question 13	correct	1	1
Question 14	correct	1	1
Question 15	correct	1	1
Question 16	correct	1	1
Question 17	correct	1	1
Question 18	correct	1	1
Question 19	correct	1	1
Question 20	correct	1	1
	Score: (100%)	**20**	**20**

1. True or False - ML tuple types are "one-of" types.

   - True
   - False (correct answer, your response)

   Feedback: Correct.

   Points earned: 1 out of 1

2. Given these type synonyms three of the types below are interchangeable with each other. Which one is not?

   ```
   type name = string * string * string
   type s = string
   ```

   - name * s -> name (correct answer, your response)
   - s * name -> name
   - string * (string * string * string) -> name
   - string * (string * string * string) -> (string * string * string)

Feedback: Correct.

Points earned: 1 out of 1

3. True or False - Items within ML tuples are access "by name"

   - True
   - False (correct answer, your response)

   Feedback: Correct.

   Points earned: 1 out of 1

4. If the ML function `foo` has type `'a -> int`, which of the following function calls are legal?

   - `val ans = foo(5)` (correct answer, your response)
   - `val ans = foo("string")` (correct answer, your response)
   - `val ans = foo(true)` (correct answer, your response)
   - `val ans = foo([1, 2, 3])` (correct answer, your response)
   - `val ans = foo(SOME 5)` (correct answer, your response)
   - `val ans = foo(NONE)` (correct answer, your response)
   - `val ans = foo(["cat", "dog", "horse"])` (correct answer, your response)
   - `val ans = foo([true, false, true])` (correct answer, your response)

   Feedback: Correct. A function with type `'a -> int` can accept any type of input and will return an `int`.

   Points earned: 1 out of 1

5. What is `ans` bound to after running the following ML code?

```
datatype int_or_string = I of int | S of string

fun mystery (xs: int_or_string) =
    case xs of
        [ ] => 0
      | (I i)::xs' => i + mystery xs'
      | (S s)::xs' => String.size s + mystery xs'

val xs = [I 3, S "seven", I ~5, S "nine"]

val ans = mystery xs
```

   The following answer is acceptable:

   7

   Your response:

   7

   Feedback: Correct

Points earned: 1 out of 1

6. Given this datatype binding:

```
datatype id = StudentNum of int
            | Name of string * (string option) * string
```

Which ML expression is syntactically correct?

- val bob = StudentNum 123456 (correct answer, your response)
- val bob = StudentNum "123456"
- val bob = id 123456

Points earned: 1 out of 1

7. What is res bound to after running the following code?

```
fun mystery (xs, y) =
    case xs of
          [ ] => true
        | _::[ ] => true
        | first::rest => (first < y andalso mystery (rest, y))

val res = mystery ([4, 3, 2, 1], 5)
```

The following answers are acceptable:

- true
- True
- TRUE

Your response:

true

Points earned: 1 out of 1

8. What is the result of evaluating this ML expression?

```
#f {f = 3, g = 12}
```

The following answer is acceptable:

3

Your response:

3

Feedback: Correct.

Points earned: 1 out of 1

9. True or False - Items within ML records are access "by position"

- True
- False (correct answer, your response)

Feedback: Correct.

Points earned: 1 out of 1

10. What will ans be bound to after the following ML code is executed?

```
val ace_of_hearts = {suit="hearts", rank="ace"}
val raisin_bran = {brand="kellogs", productID=12345}

val ans = #productID raisin_bran
```

The following answer is acceptable:
12345

Your response:
12345

Feedback: Correct

Points earned: 1 out of 1

11. Given this datatype binding:

```
datatype productID = Name of string
                   | Number of int
```

What is the ML statement that will declare a binding for a variable named apple of type productID with a value of 98765?

Your response:
val apple = Number 98765

Sample answer:
val apple = Number 98765

Answers may vary.

Points earned: 1 out of 1
Instructor's comments:

12. Which patterns match the list [5, 7, 9]?

- x :: y :: zs (correct answer, your response)
- x :: xs (correct answer, your response)
- x :: y :: [ ]
- [x, y]

Points earned: 1 out of 1

13. Given this datatype binding:

```
datatype days = Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday
```

What is the ML statement that will declare a binding for a variable named myDay of type days with a value of Sunday?

Your response:
val myDay = Sunday

Sample answer:
val myDay = Sunday

Answers may vary.

Points earned: 1 out of 1
Instructor's comments:

14. What is the result of evaluating this ML expression?

```
#h {f = 3, g = 12}
```

- Type Error (correct answer, your response)
- 3
- 12

Feedback: Correct.

Points earned: 1 out of 1

15. What is **ans** bound to after the following ML code is evaluated?

```
fun m1 (lst: 'a list) =
      case lst of
        [ ] => [ ]
      | x::[ ] => x::[ ]
      | x::(_::z) => x :: (m1 z)

val ans = m1 [2, 4, 6, 8]
```

The following answers are acceptable:
- [2,6]
- [2, 6]

Your response:
[2,6]

Feedback: Correct.

Points earned: 1 out of 1

16. Which of the following concepts would be appropriate to represent using a "one of" compound type? (Choose all that apply)

    - The GPS coordinates of a building
    - The height and width of a rectangle
    - The brand of ketchup (assuming there are only five brands) (correct answer, your response)
    - Which of the 32 NFL teams an athlete plays for (correct answer, your response)
    - The radius of a circle
    - A person's height in inches

    Feedback: Correct.

    Points earned: 1 out of 1

17. True or False - ML option types are "one-of" types.

    - True (correct answer, your response)
    - False

    Feedback: Correct.

    Points earned: 1 out of 1

18. What is x1 bound to?

```
fun mystery (f,xs) =
case xs of
[ ] => [ ]
| x::xs' => (f x)::(mystery(f,xs'))

val x1 = mystery ((fn x => x * 10), [1, 2, 3, 4])
```

    The following answers are acceptable:

    - [10, 20, 30, 40]
    - [10,20,30,40]

    Your response:

    [10,20,30,40]

    Points earned: 1 out of 1

19. What is **ans** bound to after the following ML code is evaluated?

```
fun m1 (lst: 'a list) =
      case lst of
        [ ] => [ ]
      | x::[ ] => x::[ ]
      | x::(_::z) => x :: (m1 z)

val ans = m1 [1, 2, 3, 4]
```

The following answers are acceptable:

- [1,3]
- [1, 3]

Your response:

[1,3]

Feedback: Correct.

Points earned: 1 out of 1

20. True or False - ML list types are "each-of" types.

    - True
    - False (correct answer, your response)

    Feedback: Correct.

    Points earned: 1 out of 1