

Quiz #5 Answers

1. What constructs in ML use patterns? What are we able to do with patterns (what type of purpose do they serve and what other constructs can they help replace)?

Patterns, as matches, are used by functions, case statements, and exception in ML. In these instances, they provide an alternate mechanism for selecting between different branches of code so they replace conditional statements like if or switch. Patterns can also be used in val declarations and there they function in a way they can also work in a function or a case statement, to break apart larger constructs into their smaller components.

2. Write an ML datatype that represents financial transactions. Each transaction is either a debit or a credit and each has a value (stored as an int), a date (stored as an int), and a source (stored as a string).

```
datatype finTrans = Debit of int * int * string | Credit of int * int * string;
```

Extra Credit: Write on the back an ML function that takes a string and returns a list of strings that were the words in the original string. Basically, break it up into the tokens that were separated by spaces.

The best answer used the libraries

```
fun breakWords str = String.tokens Char.isSpace str
```

Most people wouldn't get this off the top of their head though (I wouldn't have) so here is a version built from the ground up.

```
fun breakWords st =  
  let  
    fun nextWord (#" :::t) st =  
      if str<>"" then st :: nextWord t "" else nextWord t ""  
    | nextWord (h::t) st = nextWord t (st ^ str(h))  
    | nextWord nil st =  
      if st<>"" then [st] else nil  
  in  
    nextWord (explode st) ""  
  end;
```