CS320 Programming Languages
Exercise #2

1 Free Identifiers

Implement the function `freeIds`, which takes a `Expr` and produces a set of strings. The set should contain a string for each free identifier in the given `Expr`.

```
def freeIds(expr: Expr): Set[String] = ???

test(freeIds(Expr("{ val x = 1; (x + y) }")), Set("y"))
test(freeIds(Expr("{ val z = 2; 1 }")), Set())
```

2 Binding Identifiers

Implement the function `bindingIds`, which is like `freeIds`, but the result set contains a string for each binding identifier in the given `Expr` (whether or not the binding identifier is ever referenced by a bound identifier).

```
def bindingIds(expr: Expr): Set[String] = ???

test(bindingIds(Expr("{ val x = 1; (x + y) }")), Set("x"))
test(bindingIds(Expr("{ val z = 2; 1 }")), Set("z"))
```

3 Bound Identifiers

Implement the function `boundIds`, which is like `freeIds`, but the result set contains a string for each bound identifier in the given Expr.

```
def boundIds(expr: Expr): Set[String] = ???

test(boundIds(Expr("{ val x = 1; (x + y) }")), Set("x"))
test(boundIds(Expr("{ val z = 2; 1 }")), Set())
```