CS 551 Spring 2025 Quiz 1 KEY

February 19, 2025

Name:

Email:

Instructions: Put your name and email in the appropriate places. Answer, to the best of your ability the question(s) below. Additionally, sign your name below the academic honesty statement. If you deviate from these instructions in any way, you will receive a zero on the quiz.

Unless otherwise specified, you can assume that all necessary inputs have been made and there are no deliberate typos in function or type names.

1 Quiz A

Question 1:

Will the following program compile:

```
1  fn main() {
2    let mut x = 15;
3    let y = 10;
4
5    x = x + y;
6  }
```

(circle your answer)

Yes

Reason: `x` is declared as mutable, and thus line 5 is fine.

Question 2:

Will the following program compile:

```
1   fn main() {
2     let s = "Hello_world".to_string();
3     func1(s);
4     println!("{s}");
5   }
6
7   fn func1(s: String) -> String {
8     println!("{s}");
9     s
10  }
```

(circle your answer)

No

Reason: Line 3 gives ownership of `s` to `func1()`. Even though `func1()` returns `s` and, `main()` never takes ownership back. Thus, line 4 would be a use after move.

2   Quiz B

Question 1:

Will the following program compile:

```
1   fn main() {
2     let x = 15;
3     let y = 10;
4
5     let x = x + y;
6   }
```

(circle your answer)

Yes

Reason: The `let` statement on Line 5 *shadows* `x`. The old variable `x` is marked invalid and the value that was bound to it is no longer available for use.

Question 2:

Will the following program compile:

```
1   fn main() {
2     let s = String::from("Hello_world");
3     func1(&s);
4     println!("{s}");
```

```
5  }
6
7  fn func1(s: &String) -> () {
8    println!("{s}");
9  }
```

Yes

Reason: `func1()` (line 7) takes a reference to a `String` (i.e., it *borrows* its parameter). Thus, ownership is automatically returned to `main()` after the call to `func1()` on line 3.

3   Quiz C

Question 1:

Will the following program compile:

```
1  fn main() {
2    let x = 15;
3    let mut y = 10;
4
5    x = x + y;
6  }
```

(circle your answer)

No

Reason: `x` is not declared as mutable.

Question 2:

Will the following program compile:

```
1  fn main() {
2    let s = "Hello_world".to_string();
3    func1(&s);
4    println!("{s}");
5  }
6
7  fn func1(s: &str) {
8    println!("{s}");
9  }
```

(circle your answer)

Yes

Reason: `func1()` takes a `&str`, a (borrowed) string slice and a `String` can be treated like a `&str`

via a borrow. See `https://doc.rust-lang.org/std/primitive.str.html` for a more thorough explanation of the string slice type.

4 Quiz D

Question 1:

Will the following program compile:

```rust
1  fn main() {
2    let x = 15;
3    let mut y = 10;
4
5    y = x + y;
6  }
```

(circle your answer)

Yes

Reason: `y` is declared mutable on line 3.

Question 2:

Will the following program compile:

```rust
1   fn main() {
2     let s = "Hello world";
3     let s = func1(s);
4     println!("{s}");
5   }
6
7   fn func1(s: String) -> String {
8     println!("{s}");
9     s
10  }
```

(circle your answer)

No

Reason: The type of `s` on line 2 is an `&str`, but `func1()` takes a `String`.

Academic honesty statement: I have done this quiz completely on my own. I have not copied it from, nor have I given answers to anyone else. I understand that if I am involved in plagiarism or cheating I will have to sign an official form that I have cheated and that this form will be stored in my official university record. I also understand that I will receive a grade of 0 for the quiz involved, my grade in the class will be reduced by at least one level (e.g., from A to B) for my offense, and that I will receive a grade of "F" for the course for any additional offense of any kind.