

Programming Assignment 2 Test Cases

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- Simple Tests
- λ INPUT: a
 λ OUTPUT: a
OZ INPUT: a
OZ OUTPUT a
- λ INPUT: $(a\ b)$
 λ OUTPUT: $(a\ b)$
OZ INPUT: $\text{apply}(a\ b)$
OZ OUTPUT $\text{apply}(a\ b)$
- λ INPUT: $\lambda a.(a\ a)$
 λ OUTPUT: $\lambda a.(a\ a)$
OZ INPUT: $\text{lambda}(a\ \text{apply}(a\ a))$
OZ OUTPUT $\text{lambda}(a\ \text{apply}(a\ a))$
- Beta Reduction
- λ INPUT: $(\lambda a.a\ c)$
 λ OUTPUT: c
OZ INPUT: $\text{apply}(\text{lambda}(a\ a)\ c)$
OZ OUTPUT c
- λ INPUT: $(\lambda a.a\ (\lambda c.c\ (b\ b)))$
 λ OUTPUT: $(b\ b)$
OZ INPUT: $\text{apply}(\text{lambda}(a\ a)\ \text{apply}(\text{lambda}(c\ c)\ \text{apply}(b\ b)))$
OZ OUTPUT $\text{apply}(b\ b)$
- λ INPUT: $(\lambda a.(a\ b)\ (\lambda c.c\ (b\ b)))$
 λ OUTPUT: $((b\ b)\ b)$
OZ INPUT: $\text{apply}(\text{lambda}(a\ \text{apply}(a\ b))\ \text{apply}(\text{lambda}(c\ c)\ \text{apply}(b\ b)))$
OZ OUTPUT $\text{apply}(\text{apply}(b\ b)\ b)$
- Test Alpha Renaming
 λ INPUT: $(\lambda a.\lambda c.(a\ a)\ c)$
 λ OUTPUT: $\lambda d.(c\ c)$
OZ INPUT: $\text{apply}(\text{lambda}(a\ \text{lambda}(c\ \text{apply}(a\ a)))\ c)$
OZ OUTPUT $\text{lambda}(d\ \text{apply}(c\ c))$

- Eta Conversion
- λ INPUT: $\lambda a.(ba)$
 λ OUTPUT: b
OZ INPUT: `lambda(a apply(b a))`
OZ OUTPUT `b`
- λ INPUT: $\lambda a.((b c) a)$
 λ OUTPUT: a
OZ INPUT: `lambda(a apply(apply(b c) a))`
OZ OUTPUT `apply(b c)`
- λ INPUT: $\lambda a.((a b) a)$
 λ OUTPUT: $\lambda a.((a b) a)$
OZ INPUT: `lambda(a apply(apply(a b) a))`
OZ OUTPUT `lambda(a apply(apply(a b) a))`
- Complex Cases
- λ INPUT: $(\lambda a.\lambda b.(a b) (a b))$
 λ OUTPUT: $(a b)$
OZ INPUT: `apply(lambda(a lambda(b apply(a b))) apply(a b))`
OZ OUTPUT `apply(a b)`
- λ INPUT: $(\lambda a.\lambda b.\lambda c.(b c) (b c))$
 λ OUTPUT: $\lambda b.b$
OZ INPUT: `apply(lambda(a lambda(b lambda(c apply(b c)))) apply(b c))`
OZ OUTPUT `lambda(b b)`
- λ INPUT: $(\lambda a.(a \lambda a.(a a)) \lambda b.c)$
 λ OUTPUT: c
OZ INPUT: `apply(lambda(a apply(a lambda(a apply(a a)))) lambda(b c))`
OZ OUTPUT `c`
- Loop Case
- λ INPUT: $(\lambda a.b (\lambda a.(a a) \lambda a.(a a)))$
 λ OUTPUT: Infinite Loop or b
OZ INPUT: `apply(lambda(a b) apply(lambda(a apply(a a)) lambda(a apply(a a))))`
OZ OUTPUT Infinite Loop (for call by value) or `b` (for call by name)