Compilers Assignment 6

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Features Implemented

- While Loop
- Conditional Statements
- Functions
- Five data types : string, int, double, bool, char
- Arithmetic Operations
- String Concat operation
- Logical Comparisions
- Type Checking
- Basic Type inference
- Undefined symbols static analysis

Code

Link

Error Discovery Capabilities

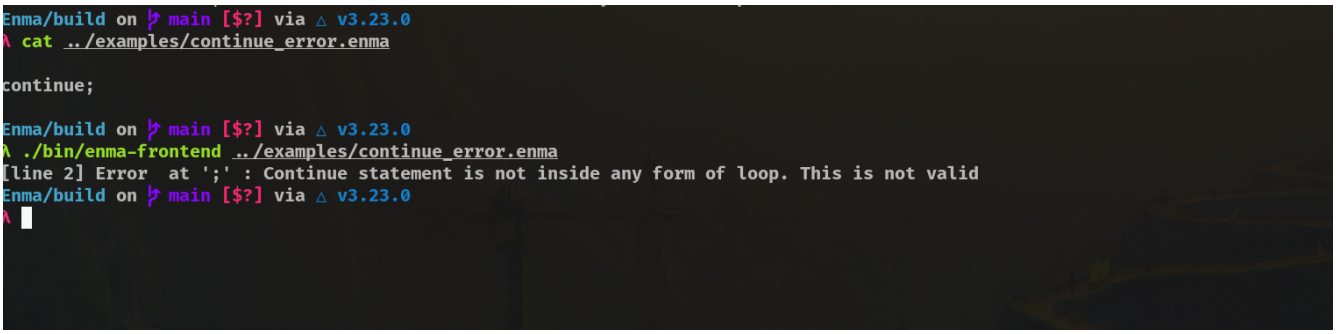
Parsing Errors

Break Outside of Loop is Error

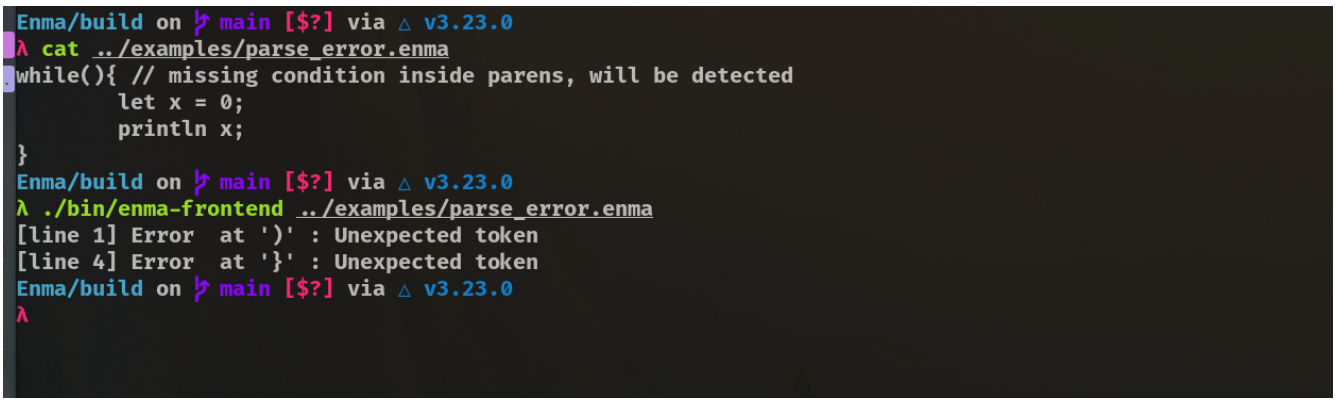
```
Enma/build on  main [$?] via △ v3.23.0 took 9s
λ cat ../examples/break_error.enma

break;
Enma/build on  main [$?] via △ v3.23.0
λ ./bin/enma-frontend ../examples/break_error.enma
[line 2] Error  at ';' : Break statement is not inside any form of loop. This is not valid
Enma/build on  main [$?] via △ v3.23.0
λ
```

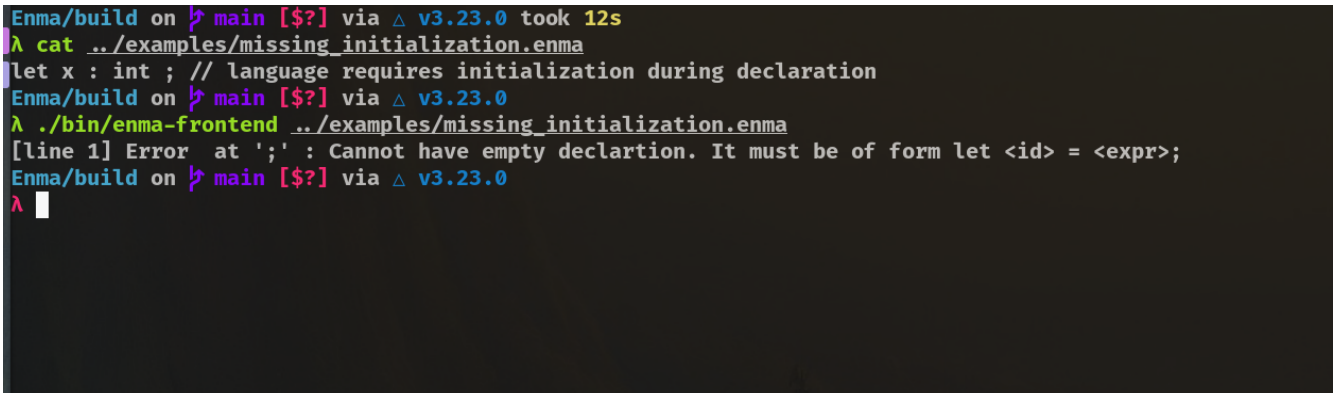
Continue Outside of Loop is Error



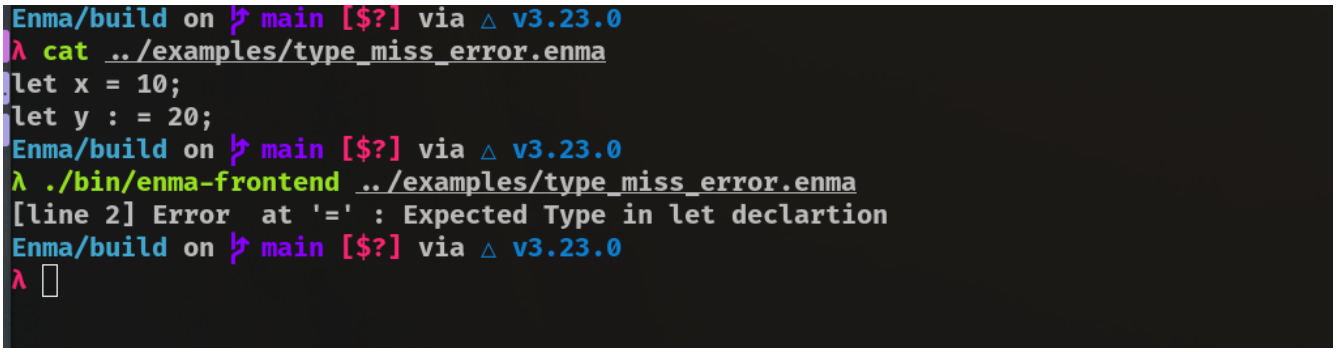
Missing condition in while loop



Missing right hand side in let statement



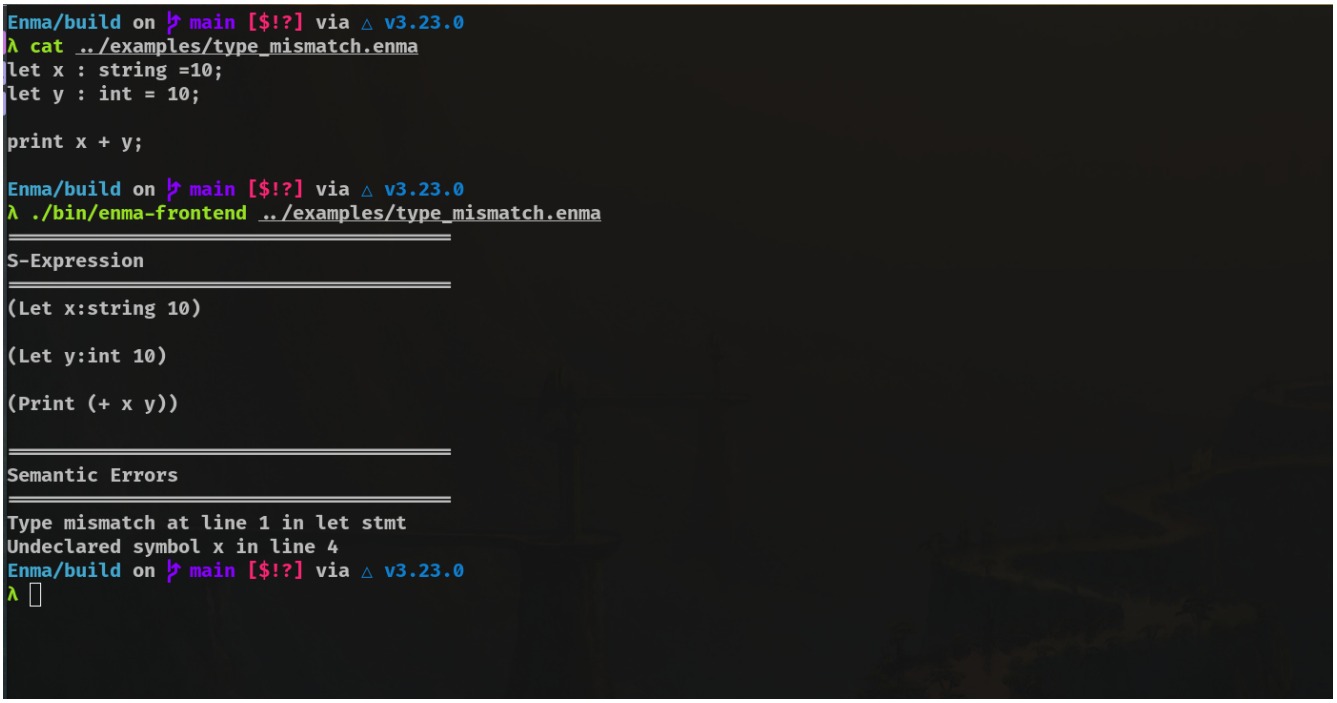
Missing Type after : in let statement



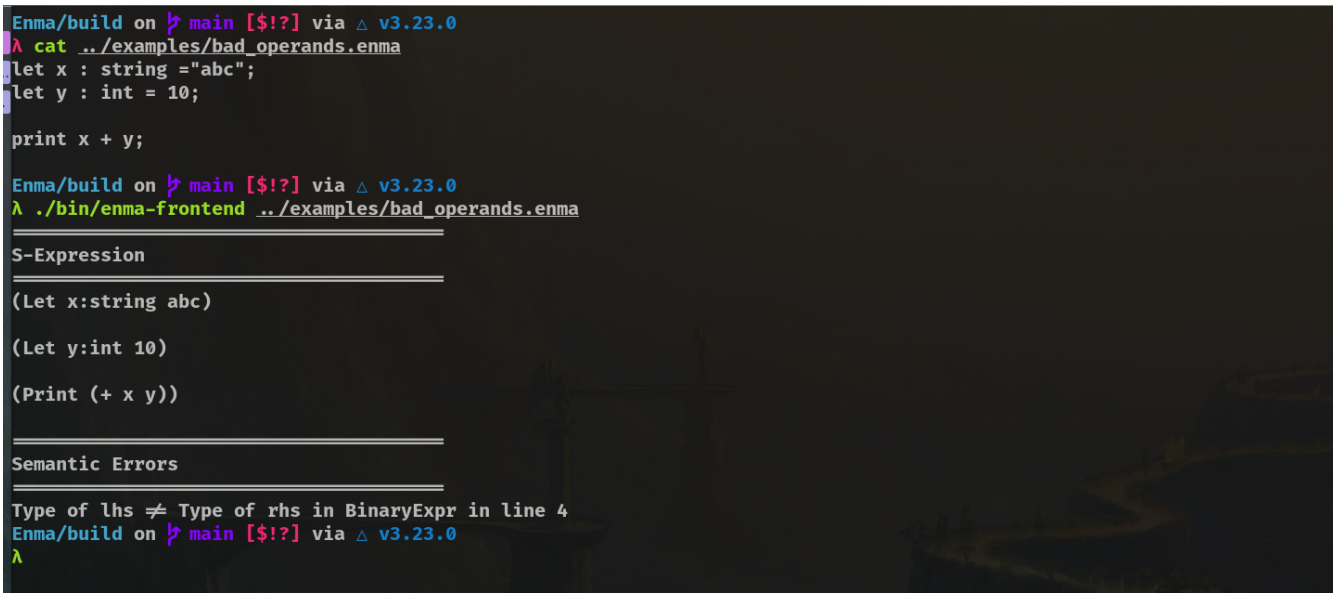
Semantic Errors with static analysis

Semantic Analysis done in this file

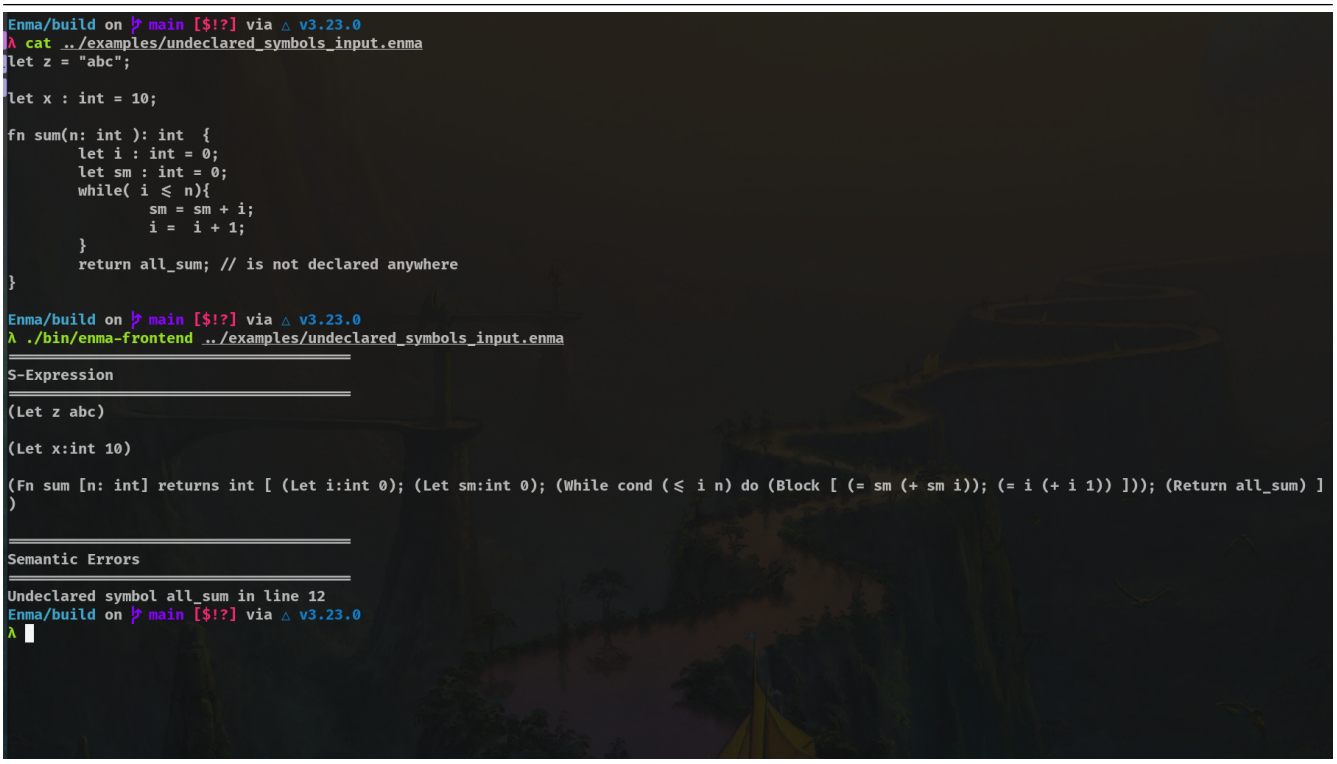
Type Mismatch



Invalid Operands

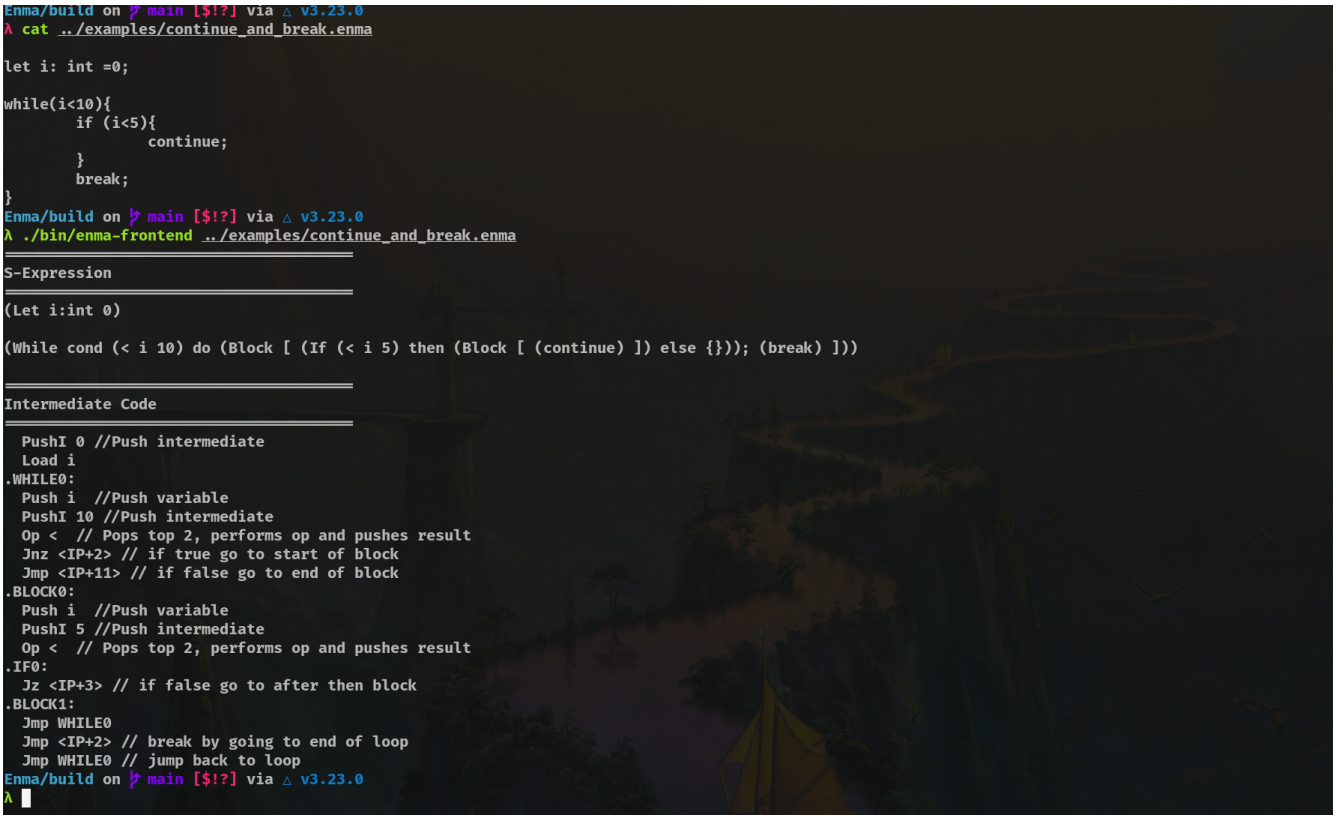


Undeclared Symbol



Intermediate Code Gen in Stack Based architecture

Codegen for continue and break



Valid Program [Here in first and third line , type is inferred automatically with type inference]

```
Enma/build on  main [$!?] via △ v3.23.0
λ cat ../examples/input.enma
let z = "abc";

let x = 10;

fn is_origin(x: int, y: int){
        let ans = true;
        if (x == 0 and y == 0 ){
                ans= true;
        }else{
                ans= !true;
        }
        return ans;
}


/* THis is sum function
It sums from 0 to n inclusive
*/

fn sum(n: int ): int  {
        let i : int = 0;
        let sm : int = 0;
        while( i ≤ n){
                sm = sm + i;
                i =  i + 1;
        }
        /*
        I want it to be able to return even if we just have

        ```

        sm
        ```

        without the return in front of it. Like in rust. Not supported
        as of now though.
        */
        return sm;
}

Enma/build on  main [$!?] via △ v3.23.0
λ
```

CodeGen for above program