



## Composite PrintStream

- stream : Collection < PrintStream >  
- error : boolean

+ add (s: PrintStream)  
+ checkError () : boolean  
+ close () : void  
+ flush () : void  
+ Print (b: boolean) : void  
+ Print (c: char) : void  
+ Print (c: char[]): void  
+ Print (d: double) : void  
+ Print (f: float) : void  
+ Print (i: int) : void  
+ Print (l: long) : void  
+ Print (obj: Object) : void  
+ Print (s: String) : void  
+ Println (b: boolean) : void  
+ Println (c: char[]): void  
+ Println (d: double) : void  
+ Println (f: float) : void  
+ Println (i: int) : void  
+ Println (l: long) : void  
+ Println (obj: Object) : void  
+ Println (s: String) : void  
+ setError () : void  
+ write (buf: byte[], off: int, len: int) : void

## Runtime EOFException

- last : boolean  
- title : String  
- receiver : Receiver  
- validatePredicate : ValidatePredicate < Receiver >  
- form : Form  
- display : Display  
+ perform (command) : void  
+ execute () : DialogException

## Command < Receiver

## Dialog

- ACTION - SWING : String  
- ACTION - TEXT : String  
+ IO : Dialog  
- subsystem : Interaction  
+ menu (menu: Menu) : void  
+ form (form: Form) : void  
+ message (d: Display) : void  
+ close () : void

## DialogException

+ getMessage () : String  
+ toString () : String

## Display

- ui : Dialog  
- title : String  
- text : String  
+ add (text: String) : Display  
+ addLine (text: String) : Display  
+ addNewline (text: String, force: boolean) : Display  
+ display (force: boolean) : void  
+ display () : void  
+ popup (toPop: Object) : void

Form
<pre> - ui: Dialog - title: String - entries: List&lt;Input&lt;?&gt;&gt;  + title(): String + entries(): Collection&lt;Input&lt;?&gt;&gt; + entry(Entry): Input&lt;?&gt; + add(im: Input&lt;?&gt;): Input&lt;?&gt; + addBooleanInput(label: String): Input&lt;Boolean&gt; + addStringInput(label: String): Input&lt;String&gt; + addFloatInput(label: String): Input&lt;Float&gt; + addIntegerInput(label: String): Input&lt;Integer&gt; + parse(): void + parse(clear: boolean): void + clear(): void </pre>

<< interface >> Interaction
<pre> + menu(Menu.Menu): void + form(form: Form): void + message(display: Display): void + setTitle(title: String): void + close(): void </pre>

Input<T> type
<pre> - prompt: String - regex: String - clear: boolean - value: T  + prompt(): String + clear(): void + dirty(): void + cleared(): boolean + <sup>abstracts</sup> parse(im: String): boolean + regex(): String + toString(): String </pre>

Input String
<pre> + parse(im: String): boolean </pre>

Input Boolean
<pre> + parse(im: String): boolean + toString(): String </pre>

Input Float
<pre> + parse(im: String): boolean </pre>

Input Integer
<pre> + parse(im: String): boolean </pre>

Input None
<pre> + parse(im: String): boolean </pre>

## Interaction Using Applet

```

- main(): void
+ init(): void
+ close(): void
+ setTitle(title: String): void
+ menu(m: Menu): void
+ form(f: Form): void
+ message(d: Display): void
+ message(s: String, title: String): void

```

## Applet Panel

```

- opt: int
- end: boolean
- inputs: Map<Input?, JtextField>
+ actionPerformed(evt: ActionEvent): void
+ sleep(m: int): void
+ await(): void
+ option(): int
+ parse(): boolean

```

## Interaction Using Swing

```

+ close(): void
+ menu(m: Menu): void
+ form(f: Form): void
+ message(d: Display): void
+ message(s: String, title: String)

```

## Swing Panel

```

- opt: int
- end: boolean
- ins: Map<Input?, JtextField>
- locs: Object
+ actionPerformed(evt: ActionEvent)
- sleep(m: int): void
+ await(): void
+ option(): int
+ parse(): boolean

```

## Interaction Using Text

```

- in: BufferedReader
- out: PrintStream
- log: PrintStream
- writeInput: boolean
+ closeDown(): void
+ menu(m: Menu): void
+ form(f: Form): void
+ message(d: Display)
+ setTitle(title: String): void
+ close(): void
+ readInteger(prompt: String): int
+ readString(prompt: String): String
+ println(text: String): void
+ print(text: String): void

```

## Menu

```

- title: String
- commands: Command<?>[]
- uc: Dialog
+ title(): String
+ size(): int
+ entry(m: int): Command<?>
+ entries(): Command<?>[]
+ open(): void

```

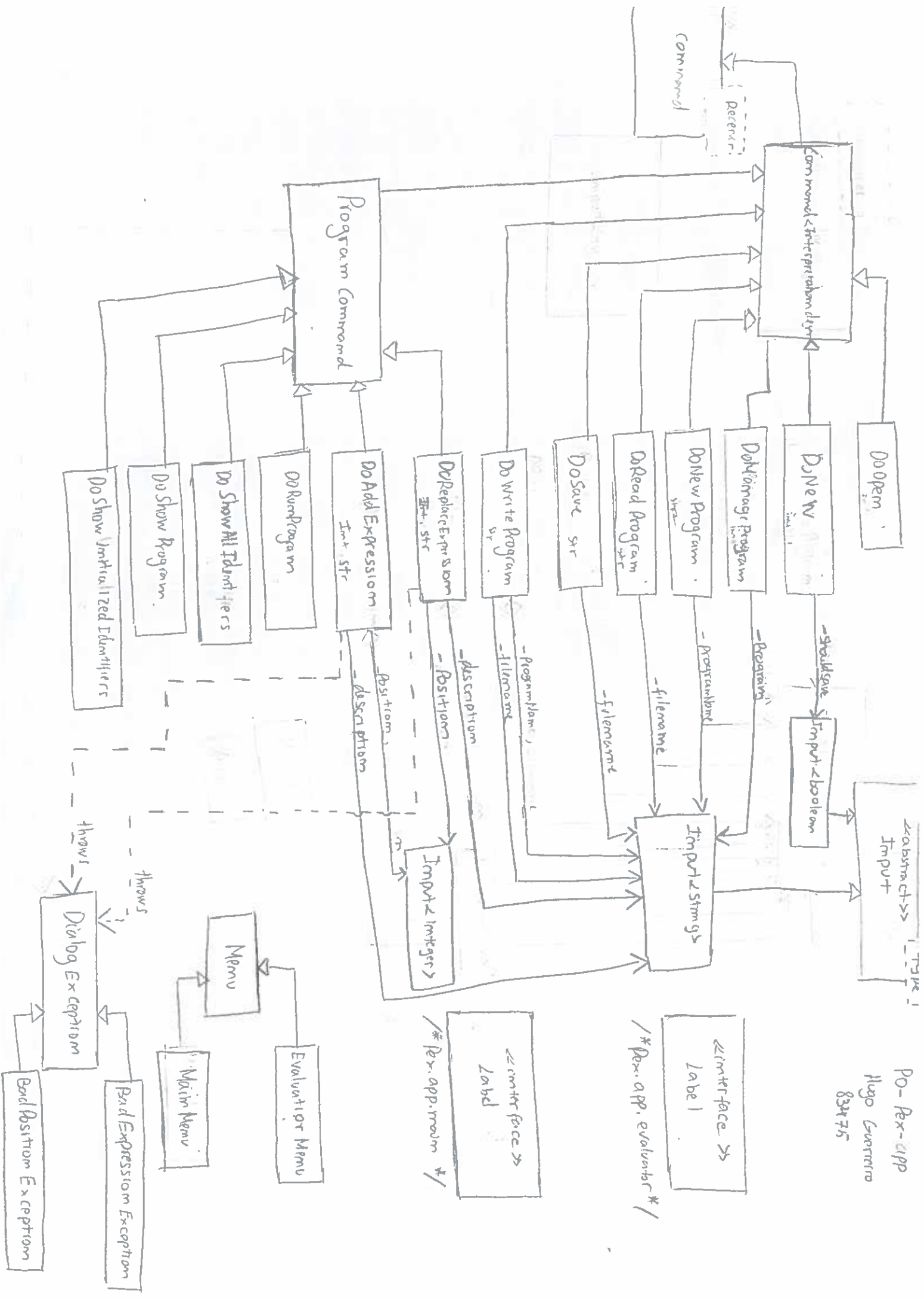
## Validly Predicate < Receiver >

```

- receiver: Receiver
+ isValid(): boolean

```









Do Add Expression
- Position: Input <Integer>
- description: Input <String>
+ execute(): void

Do Replace Expression
- Position: Input <Integer>
- description: Input <String>
+ execute(): void

Do Run Program
+ execute(): void

Program Command
# - interpreter: Input <String>

Do Show All Identifiers
+ execute(): void

Do Show Program
+ execute(): void

Do Show uninitialized identifiers
+ execute(): void

Do Manage Program
~ - Program: Input <String>
+ execute(): void

Do Save
~ - filename: Input <String>
+ execute(): void

Do New
~ - Should Save? Input <Boolean>
+ execute(): void

Do New Program
~ - Program Name: Input <String>
+ execute(): void

Do Open
+ execute(): void

Do Read Program
~ - filename: Input <String>
+ execute(): void

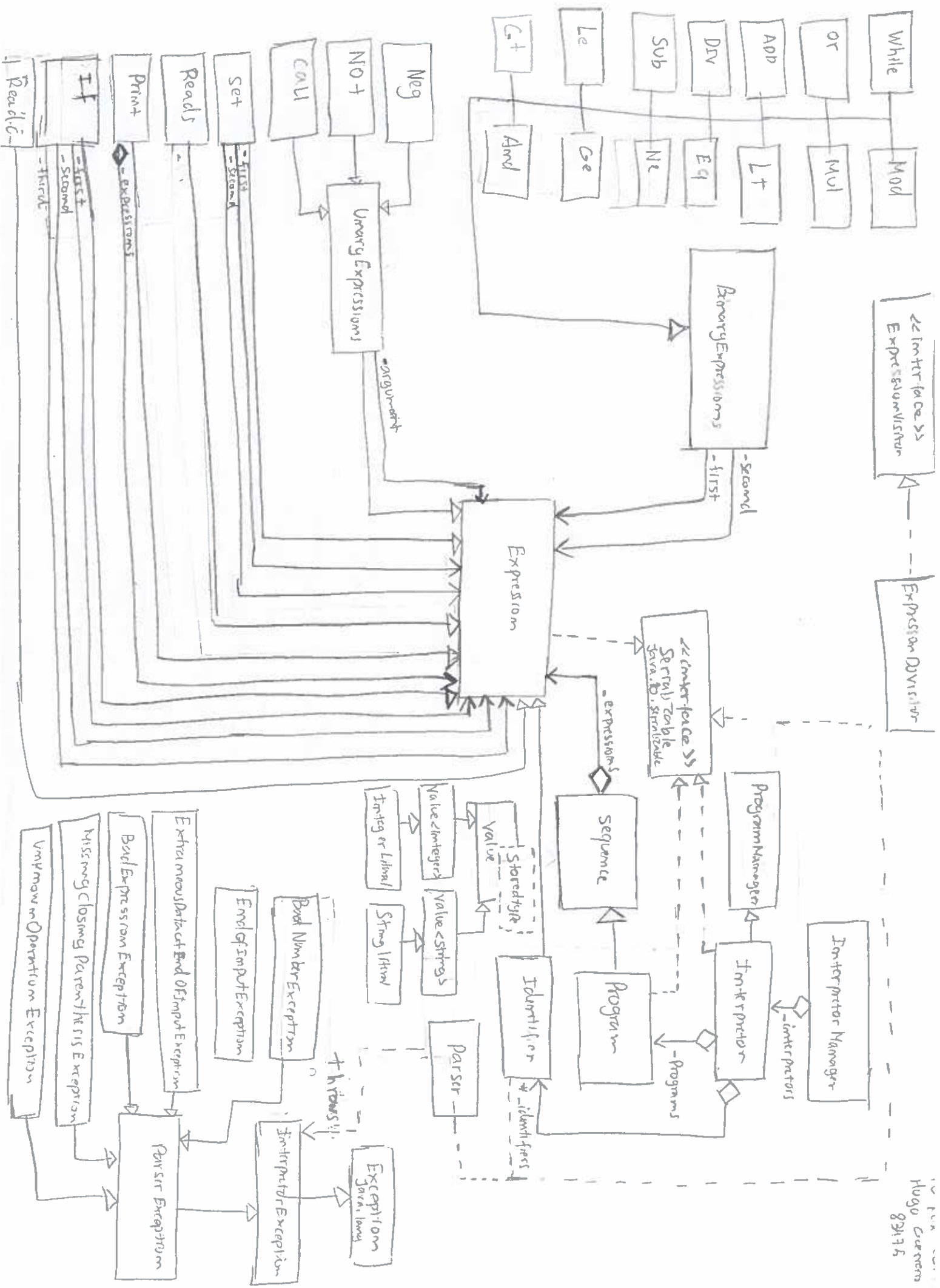
Do Write Program
~ - Program Name: Input <String>
~ - filename: Input <String>
+ execute()

New Menu
----------

Bad Expression Exception
~ - description: String
+ getMessage(): String

Bad Position Exception
~ - position: int
+ getMessage(): String





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Unary Expression
- argument : Expression

Expression
+ accept ( visitor : ExpressionVisitor, Value

Parser
+ Parse ( description : String ) : Expression
+ Parse Program File ( filename : String ) : Program
+ Parse ( input : PushbackReader ) : Expression
+ Parse Composite Expression ( input : PushbackReader ) : Expression
+ Parse Simple Operation ( operation : String, input : PushbackReader ) : Expression
+ Parse Var Arg Operation ( operation : String, input : PushbackReader ) : Expression
+ Parse Number Literal ( input : PushbackReader ) : Expression
+ Parse Identifier ( input : PushbackReader ) : Expression
+ Parse String Literal ( input : PushbackReader ) : Expression
+ Trim ( input : PushbackReader ) : void

ProgramManager
+ request Program Id ( ) : String
+ Program File Name ( ) : String
+ request Program ( ) : void
+ request Expression ( ) : Expression
+ request Position ( ) : int
+ new Program ( ) : Program
+ Read Program ( ) : void
+ write Program ( ) : void
+ Add Expression ( ) : void
+ Replace Expression ( ) : void
+ Show Identifier ( ) : void
+ Show Uninitialized Identifier ( ) : void

ParserException

Value < Stored type >
~ value : Stored type
+ toString ( ) : String

Program
- name : String

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<<interface>>

ExpressionVisitor

```
+ visit(eq: Eq): Value
+ visit(me: Ne): Value
+ visit(le: Le): Value
+ visit(ge: Ge): Value
+ visit(gt: Gt): Value
+ visit(amd: And): Value
+ visit(seq: Sequence): Value
+ visit(print: Print): Value
+ visit(neg: Neg): Value
+ visit(not: Not): Value
+ visit(call: Call): Value
+ visit(if: If): Value
+ visit(read: Read): Value
+ visit(reads: Reads): Value
+ visit(while: While): Value
+ visit(set: Set): Value
+ visit(or: Or): Value
+ visit(add: Add): Value
+ visit(div: Div): Value
+ visit(sub: Sub): Value
+ visit(mod: Mod): Value
+ visit(mul: Mul): Value
+ visit(lt: Lt): Value
+ visit(exp: Expression): Value
```

Expression DoVisitor

```
+ visit(eq: Eq): value
+ visit(me: Ne): value
+ visit(le: Le): value
+ visit(ge: Ge): value
+ visit(gt: Gt): value
+ visit(amd: And): value
+ visit(seq: Sequence): value
+ visit(print: Print): value
+ visit(neg: Neg): value
+ visit(not: Not): value
+ visit(call: Call): value
+ visit(if: If): value
+ visit(read: Read): value
+ visit(reads: Reads): value
+ visit(while: While): value
+ visit(set: Set): value
+ visit(or: Or): value
+ visit(add: Add): value
+ visit(div: Div): value
+ visit(sub: Sub): value
+ visit(mod: Mod): value
+ visit(mul: Mul): value
+ visit(lt: Lt): value
+ visit(exp: Expression): value
```

Interpreter

```
- Programs: HashMap<String, Program>
- ProgramFile: String
- identifiers: HashMap<String, values>
+ evaluateExpression(Expression: Expression): Value
+ interpretExpressions(Expressions: Expression) Value
+ SaveProgram(filename: String): void
+ SaveProgram(): void
+ interpretExpression(filename: String): value
+ evaluateExpressions(filename: String): value
```

Interpreter Manager

```
T_Interpreter: HashMap<String, Interpreter>
+ OpenInterpreter(): void
+ SaveInterpreterState(): void
+ NewInterpreter(): void
+ exit(): void
+ RestartInterpreter(filename: String): void
+ RemoveInterpreter(filename: String): void
```

Eq
+ accept (visitor: ExpressionVisitor): Value

Ne
+ accept (visitor: ExpressionVisitor): Value

Lc
+ accept (visitor: ExpressionVisitor): Value

Ge
+ accept (visitor: ExpressionVisitor): Value

Gt
+ accept (visitor: ExpressionVisitor): Value

And
+ accept (visitor: ExpressionVisitor): Value

Sequence
- expressions: List<Expression>
+ accept (visitor: ExpressionVisitor): Value

Print
- expressions: List<Expression>
+ accept (visitor: ExpressionVisitor): Value

Neg
+ accept (visitor: ExpressionVisitor): Value

Not
+ accept (visitor: ExpressionVisitor): Value

Call
+ accept (visitor: ExpressionVisitor): Value

If
- first: Expression
- second: Expression
- third: Expression
+ accept (visitor: ExpressionVisitor): Value

Readi
- value: int
+ accept (visitor: ExpressionVisitor): Value

Reads
- value: String
+ accept (visitor: ExpressionVisitor): Value

Binary Expression
- first: Expression
- second: Expression

While
- first: Expression
- second: Expression
+ accept (visitor: ExpressionVisitor): Value

Set
- first: Expression
- second: Expression
+ accept (visitor: ExpressionVisitor): Value

Identifier
- name: String
+ accept (Visitor: ExpressionVisitor): Value

Integer Literal
+ accept (Visitor: ExpressionVisitor): Value

String Literal
+ accept (Visitor: ExpressionVisitor): Value

Bad Expression Exception
- description: String

Bad Number Exception
- description: String

End of Input Exception
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Extraneous Delimiter End of Input Exception
- C: char

Integer Exception
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Missing Closing Parenthesis Exception
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Unknown Operator Exception
- description: String

Or
+ accept (Visitor: ExpressionVisitor): Value

Add
+ accept (Visitor: ExpressionVisitor): Value

Div
+ accept (Visitor: ExpressionVisitor): Value

Sub
+ accept (Visitor: ExpressionVisitor): Value

Mod
+ accept (Visitor: ExpressionVisitor): Value

Not
+ accept (Visitor: ExpressionVisitor): Value

Lt
+ accept (Visitor: ExpressionVisitor): Value