Mini Compiler (GUI Based Application)

Project Guide & Report

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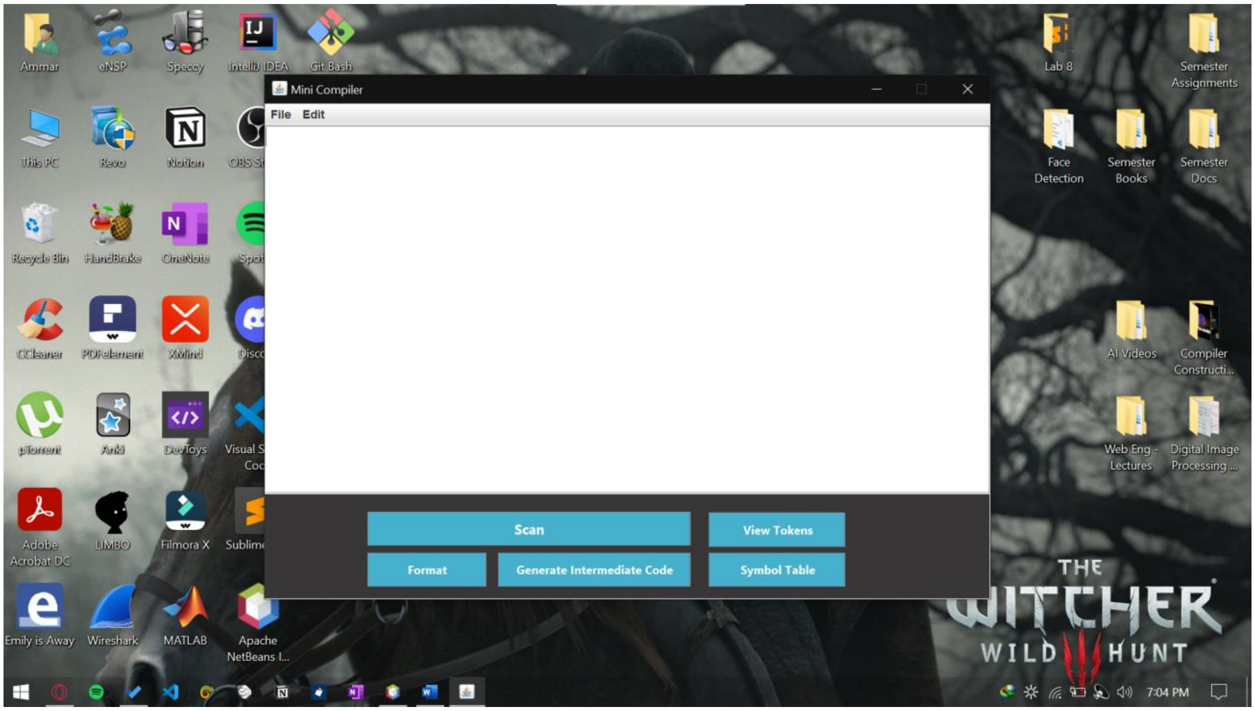
The project can be executed by opening it in an IDE such as NetBeans or IntelliJ. Following is the initial project interface.

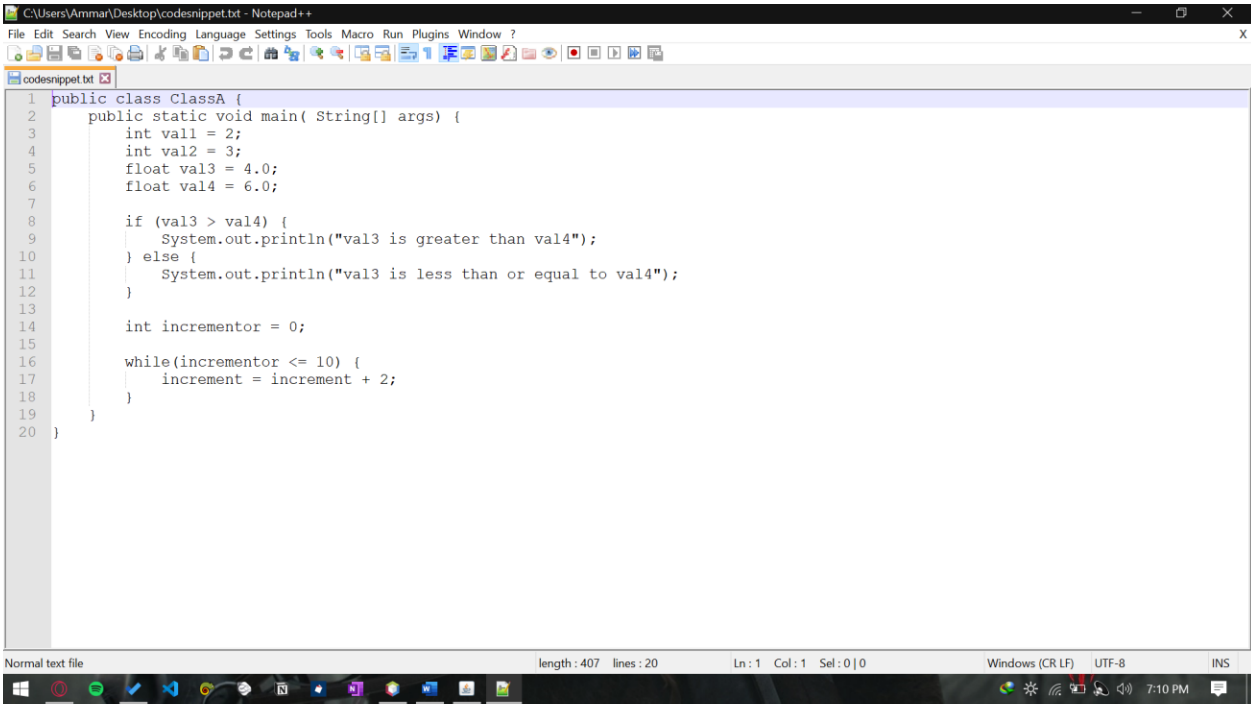


Let us demonstrate the functionalities that the application provides. You can either write the code directly in the application's text area or you can open any text file.

Let us first open any text file:

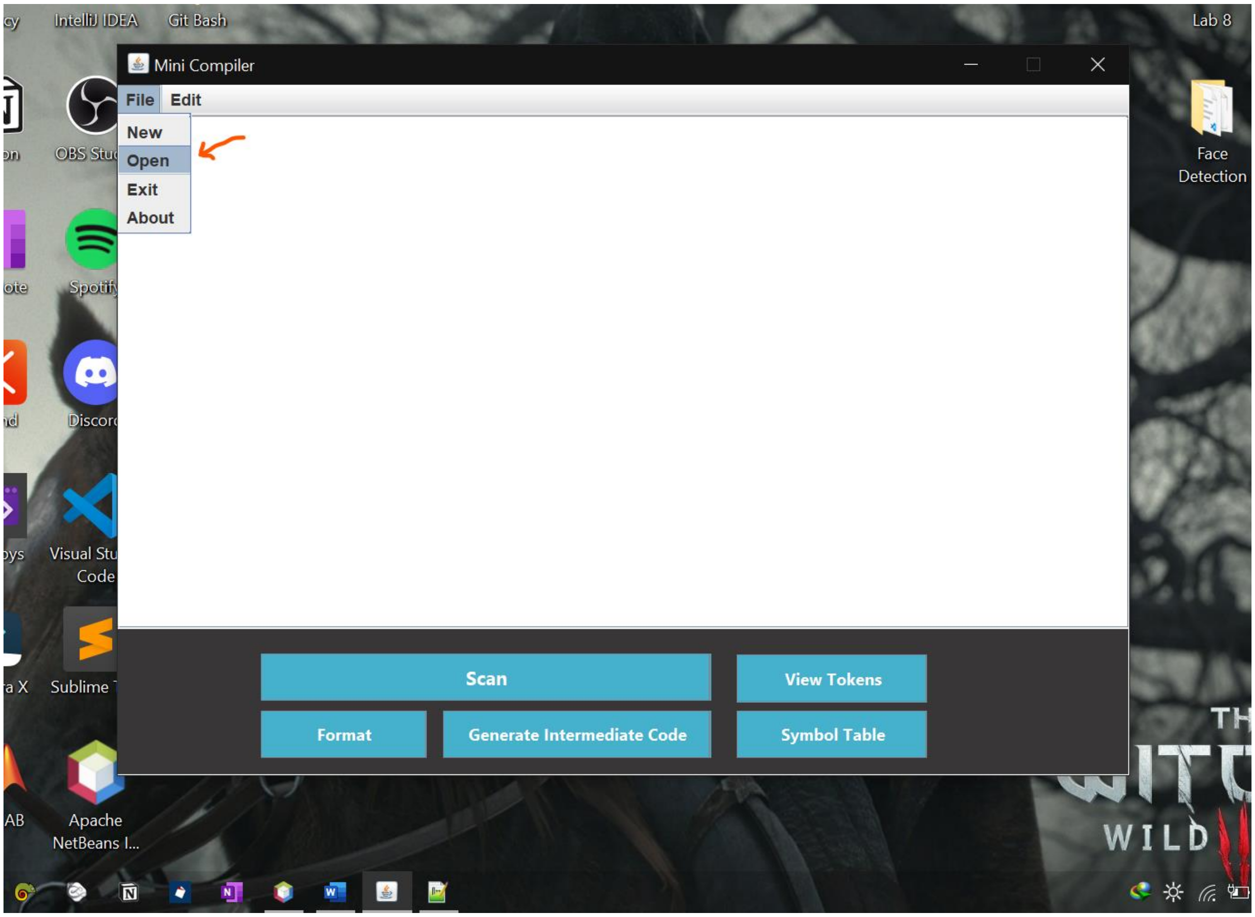
Taking a file as an input:

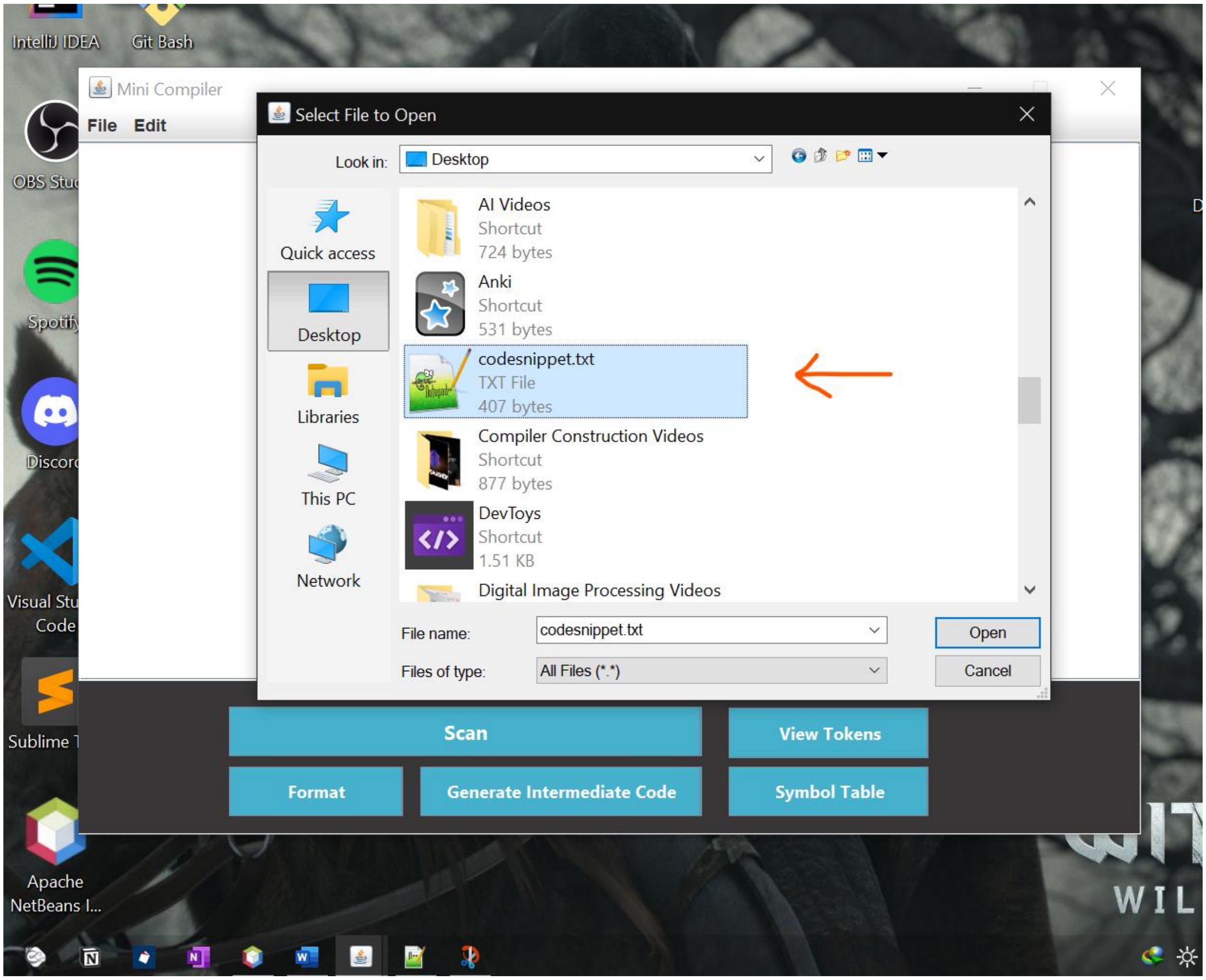
Say we have the following code snippet:


C:\Users\Ammar\Desktop\codesnippet.txt - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
codesnippet.txt
Normal text file
length : 407 lines : 20
Ln : 1 Col : 1 Sel : 0 | 0
Windows (CR LF)
UTF-8
INS
7:10 PM

```
public class ClassA {
    public static void main( String[] args) {
        int val1 = 2;
        int val2 = 3;
        float val3 = 4.0;
        float val4 = 6.0;

        if (val3 > val4) {
            System.out.println("val3 is greater than val4");
        } else {
            System.out.println("val3 is less than or equal to val4");
        }

        int incrementor = 0;

        while(incrementor <= 10) {
            increment = increment + 2;
        }
    }
}
```

We can open the file in the application as follows:





Select File to Open

Look in: Desktop

AI Videos
Shortcut
724 bytes

Anki
Shortcut
531 bytes

codesnippet.txt
TXT File
407 bytes

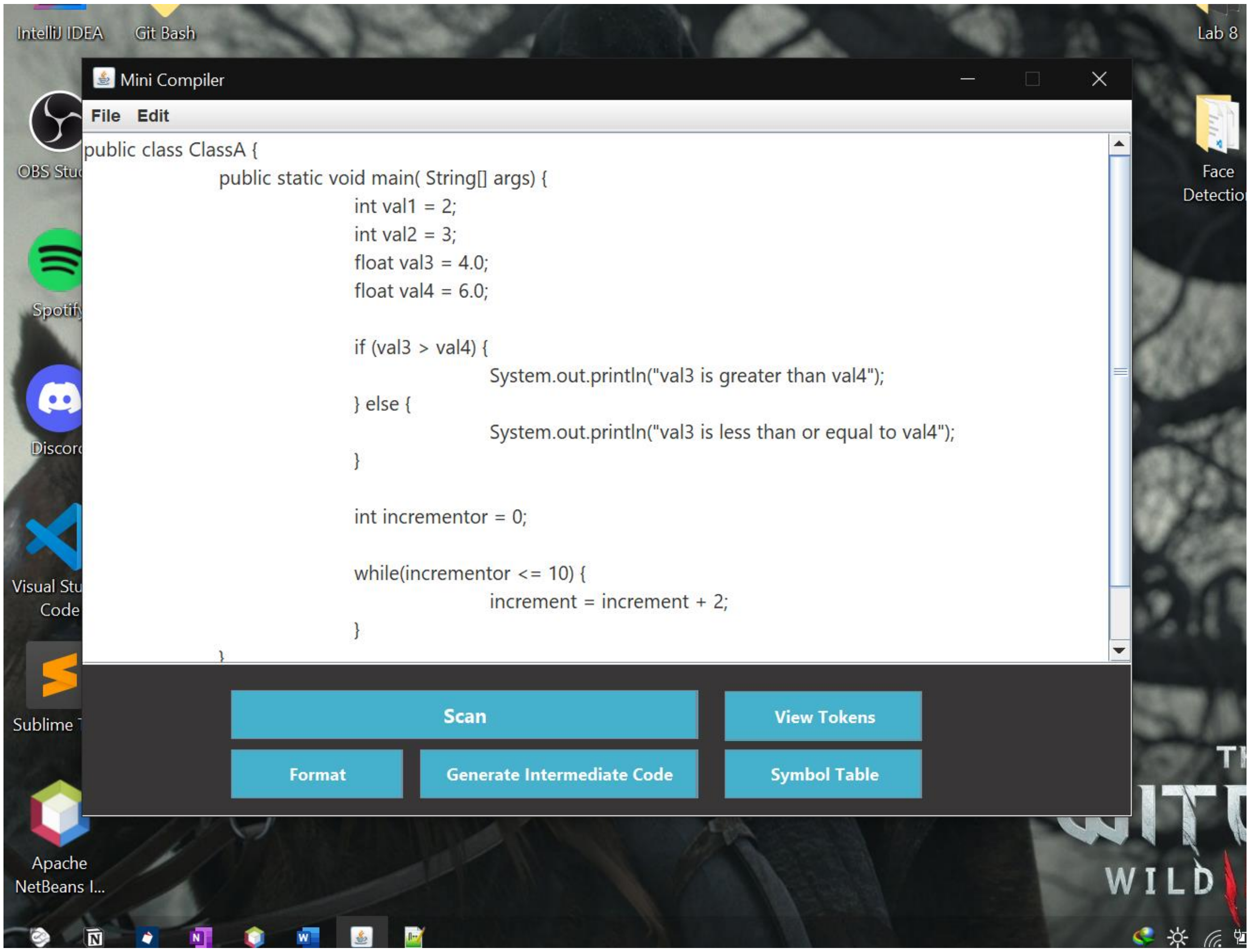
Compiler Construction Videos
Shortcut
877 bytes

DevToys
Shortcut
1.51 KB

Digital Image Processing Videos

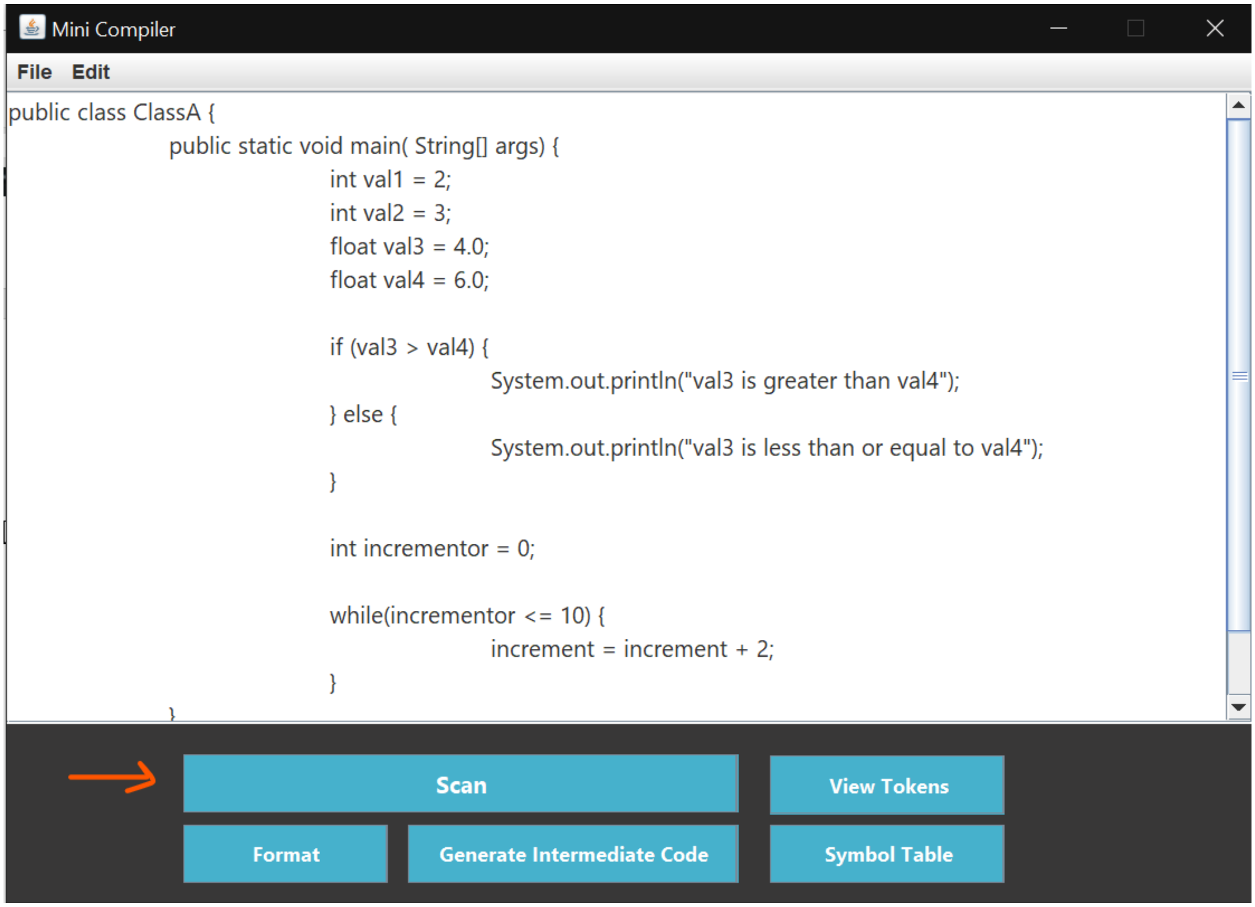
File name: codesnippet.txt

Files of type: All Files (*.*)

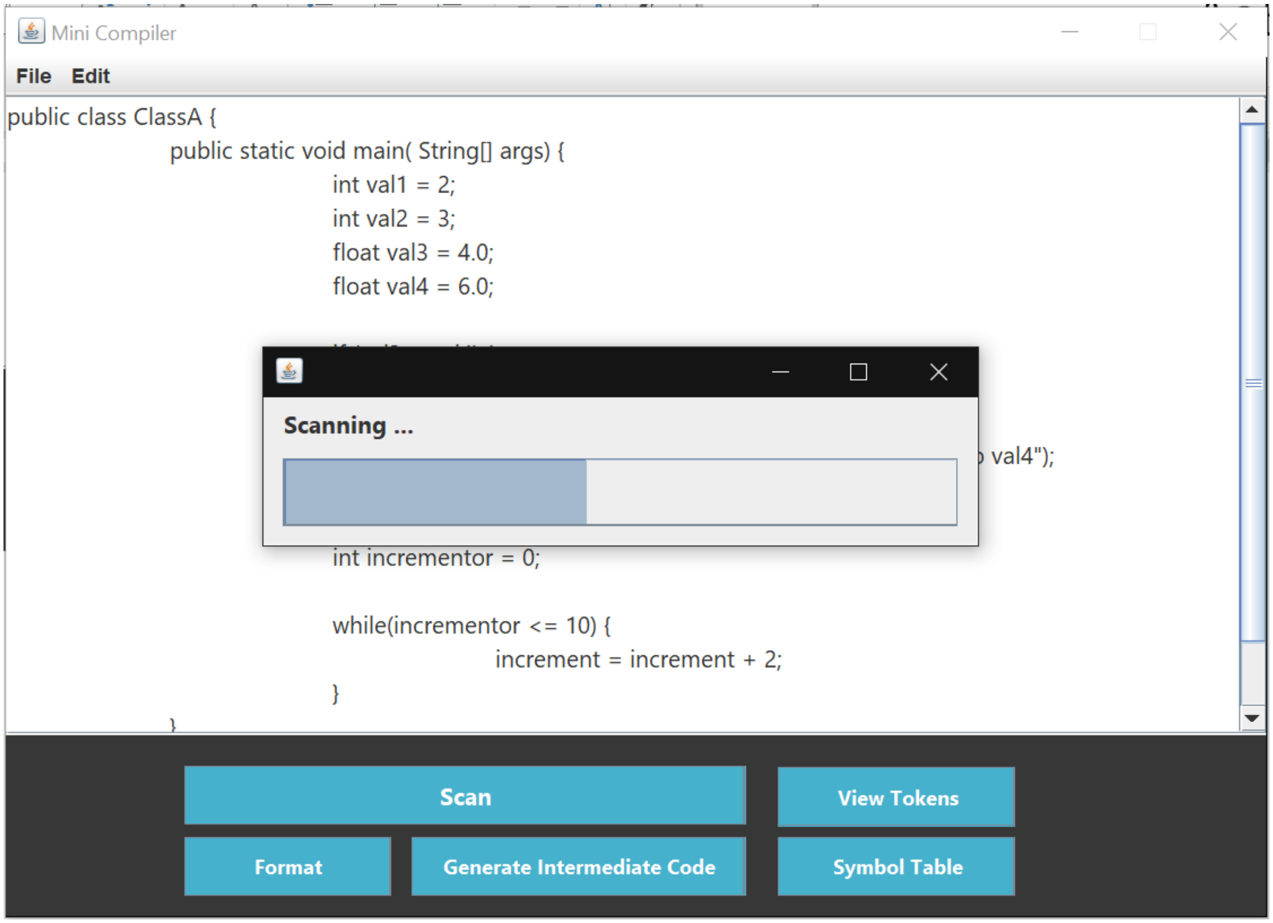


```
public class ClassA {
        public static void main( String[] args) {
                int val1 = 2;
                int val2 = 3;
                float val3 = 4.0;
                float val4 = 6.0;

                if (val3 > val4) {
                        System.out.println("val3 is greater than val4");
                } else {
                        System.out.println("val3 is less than or equal to val4");
                }

                int incrementor = 0;

                while(incrementor <= 10) {
                        increment = increment + 2;
                }
        }
```

The user can click the “Scan” button to scan the given input.

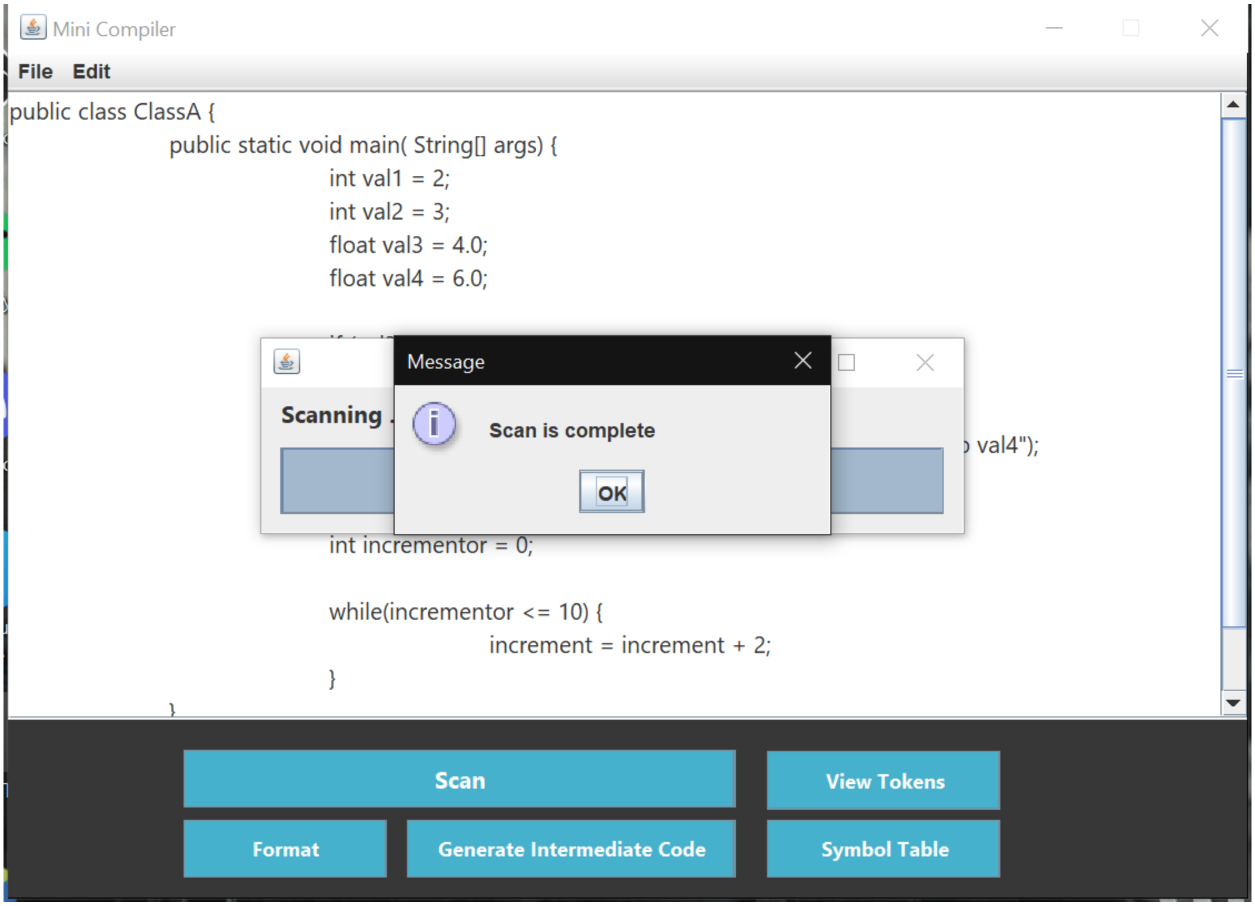


```
public class ClassA {
        public static void main( String[] args) {
                int val1 = 2;
                int val2 = 3;
                float val3 = 4.0;
                float val4 = 6.0;

                if (val3 > val4) {
                        System.out.println("val3 is greater than val4");
                } else {
                        System.out.println("val3 is less than or equal to val4");
                }

                int incrementor = 0;

                while(incrementor <= 10) {
                        increment = increment + 2;
                }
        }
```



```
public class ClassA {
        public static void main( String[] args) {
                int val1 = 2;
                int val2 = 3;
                float val3 = 4.0;
                float val4 = 6.0;

                                                           val4");

                int incrementor = 0;

                while(incrementor <= 10) {
                        increment = increment + 2;
                }
        }
```

Scanning ...

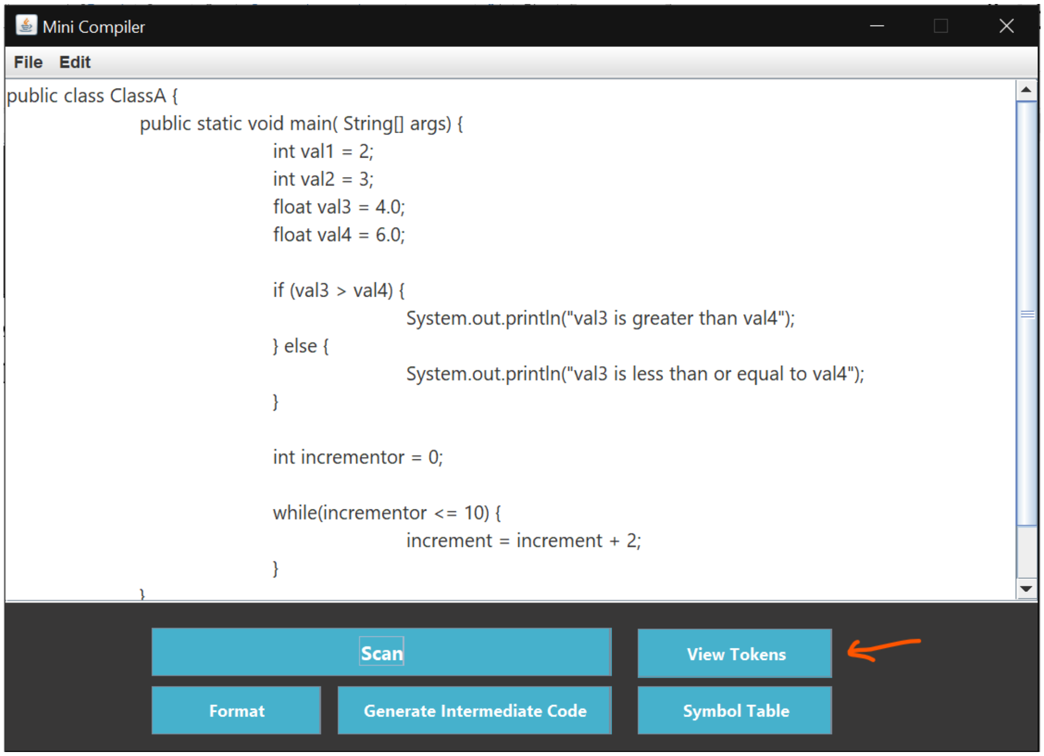


```
public class ClassA {
		public static void main( String[] args) {
				int val1 = 2;
				int val2 = 3;
				float val3 = 4.0;
				float val4 = 6.0;

				if (

				                                                       val4");

				int incrementor = 0;

				while(incrementor <= 10) {
						increment = increment + 2;
				}
		}
```

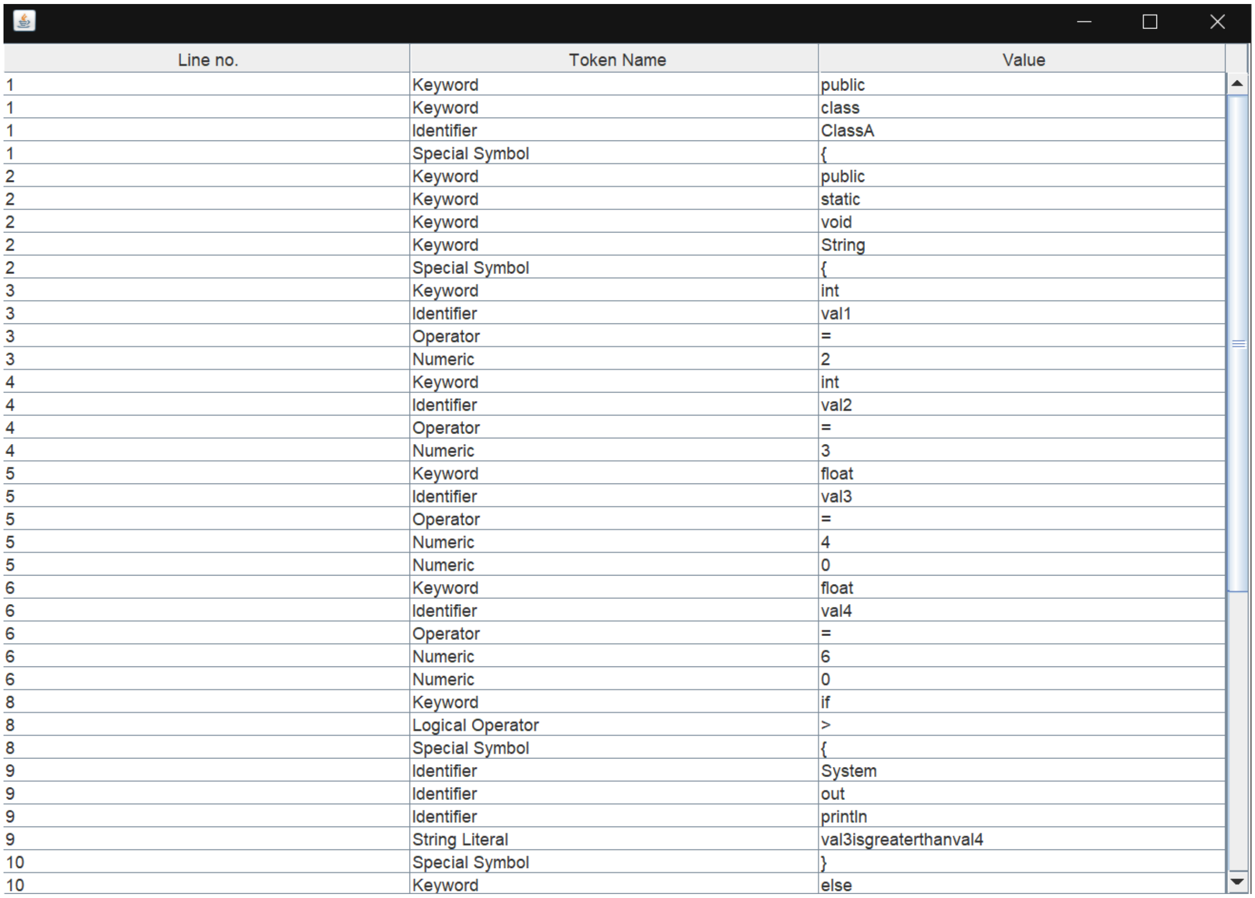
Scan is complete

View Tokens:

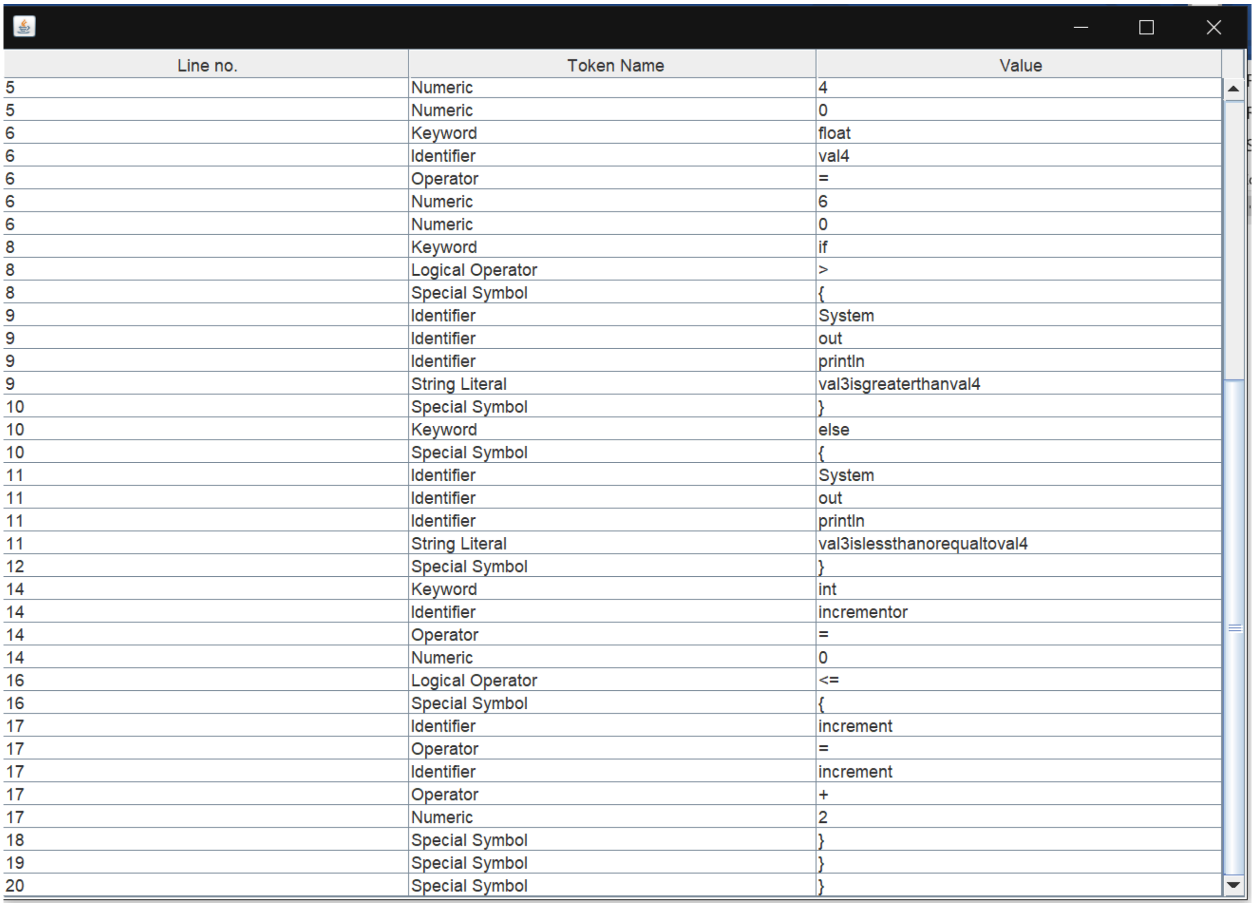
After the scan has been complete let us view the tokens that have created. Click on the “View Tokens Button”.



```
public class ClassA {
		public static void main( String[] args) {
				int val1 = 2;
				int val2 = 3;
				float val3 = 4.0;
				float val4 = 6.0;

				if (val3 > val4) {
						System.out.println("val3 is greater than val4");
				} else {
						System.out.println("val3 is less than or equal to val4");
				}

				int incrementor = 0;

				while(incrementor <= 10) {
						increment = increment + 2;
				}
		}
```



Line no.	Token Name	Value
1	Keyword	public
1	Keyword	class
1	Identifier	ClassA
1	Special Symbol	{
2	Keyword	public
2	Keyword	static
2	Keyword	void
2	Keyword	String
2	Special Symbol	{
3	Keyword	int
3	Identifier	val1
3	Operator	=
3	Numeric	2
4	Keyword	int
4	Identifier	val2
4	Operator	=
4	Numeric	3
5	Keyword	float
5	Identifier	val3
5	Operator	=
5	Numeric	4
5	Numeric	0
6	Keyword	float
6	Identifier	val4
6	Operator	=
6	Numeric	6
6	Numeric	0
8	Keyword	if
8	Logical Operator	>
8	Special Symbol	{
9	Identifier	System
9	Identifier	out
9	Identifier	println
9	String Literal	val3isgreaterthanval4
10	Special Symbol	}
10	Keyword	else

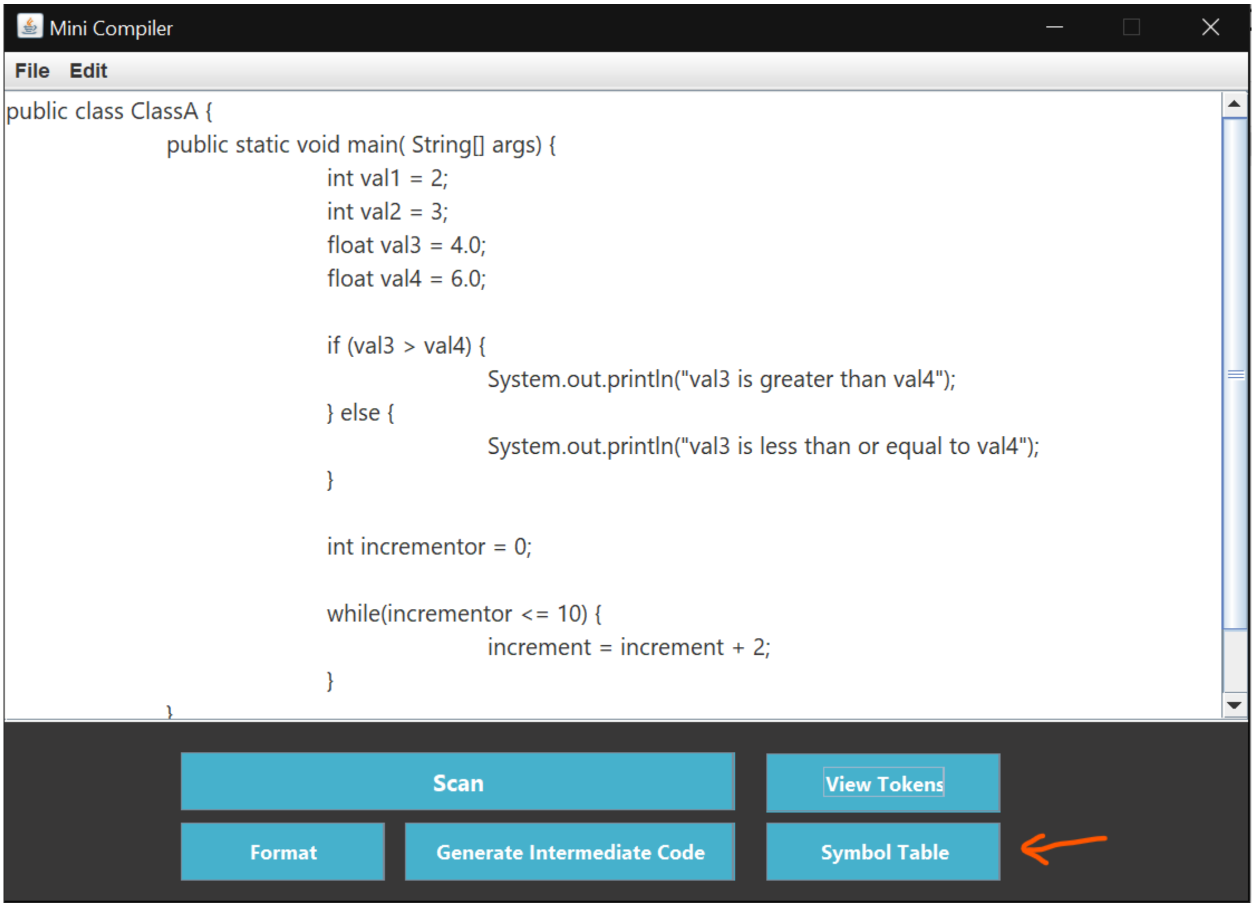


Line no.	Token Name	Value
5	Numeric	4
5	Numeric	0
6	Keyword	float
6	Identifier	val4
6	Operator	=
6	Numeric	6
6	Numeric	0
8	Keyword	if
8	Logical Operator	>
8	Special Symbol	{
9	Identifier	System
9	Identifier	out
9	Identifier	println
9	String Literal	val3isgreaterthanval4
10	Special Symbol	}
10	Keyword	else
10	Special Symbol	{
11	Identifier	System
11	Identifier	out
11	Identifier	println
11	String Literal	val3islessthanorequaltoval4
12	Special Symbol	}
14	Keyword	int
14	Identifier	incrementor
14	Operator	=
14	Numeric	0
16	Logical Operator	<=
16	Special Symbol	{
17	Identifier	increment
17	Operator	=
17	Identifier	increment
17	Operator	+
17	Numeric	2
18	Special Symbol	}
19	Special Symbol	}
20	Special Symbol	}

Above are all the tokens generated from the given source code.

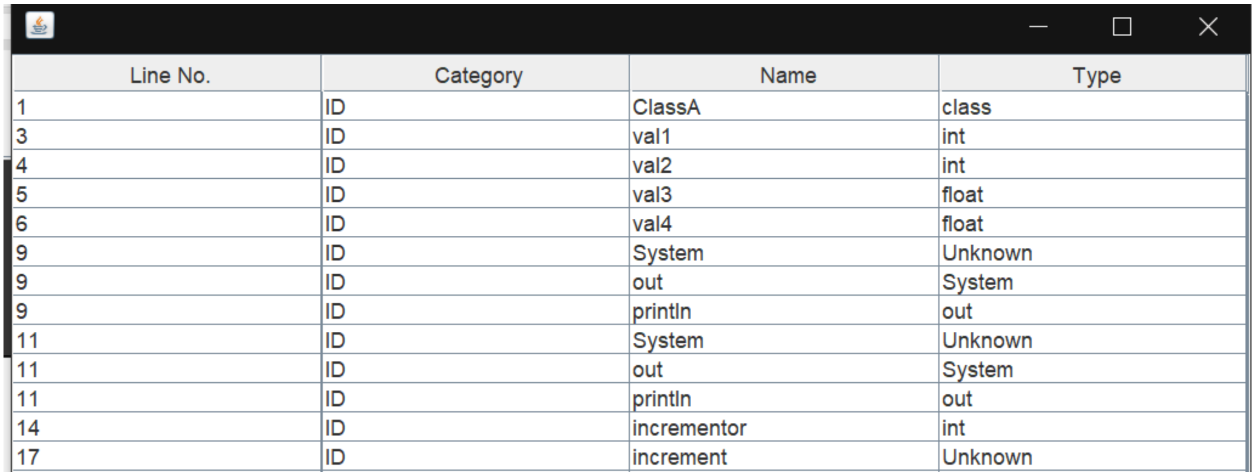
Symbol Table:

Let us now move towards viewing the symbol table. The user can view the symbol table by clicking on “Symbol Table” Button.



```
public class ClassA {
        public static void main( String[] args) {
                int val1 = 2;
                int val2 = 3;
                float val3 = 4.0;
                float val4 = 6.0;

                if (val3 > val4) {
                        System.out.println("val3 is greater than val4");
                } else {
                        System.out.println("val3 is less than or equal to val4");
                }

                int incrementor = 0;

                while(incrementor <= 10) {
                        increment = increment + 2;
                }
        }
```

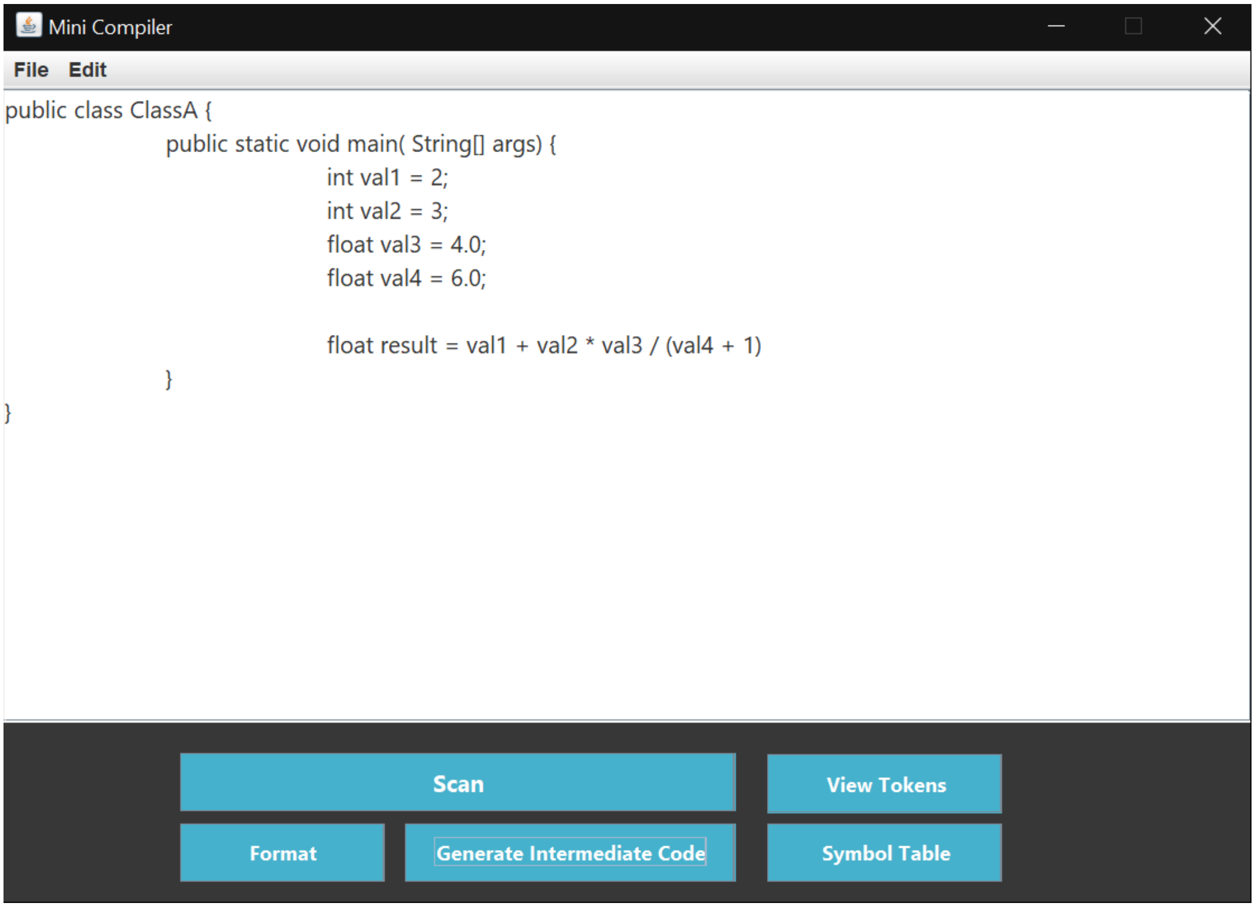
Following is the maintained symbol table:



Line No.	Category	Name	Type
1	ID	ClassA	class
3	ID	val1	int
4	ID	val2	int
5	ID	val3	float
6	ID	val4	float
9	ID	System	Unknown
9	ID	out	System
9	ID	println	out
11	ID	System	Unknown
11	ID	out	System
11	ID	println	out
14	ID	incrementor	int
17	ID	increment	Unknown

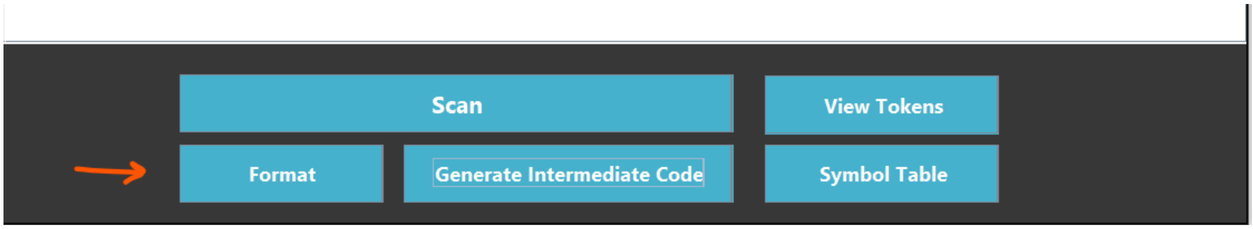
Editing the code in the text area:

Let us modify the code to demonstrate the working of 3 Address code generation.

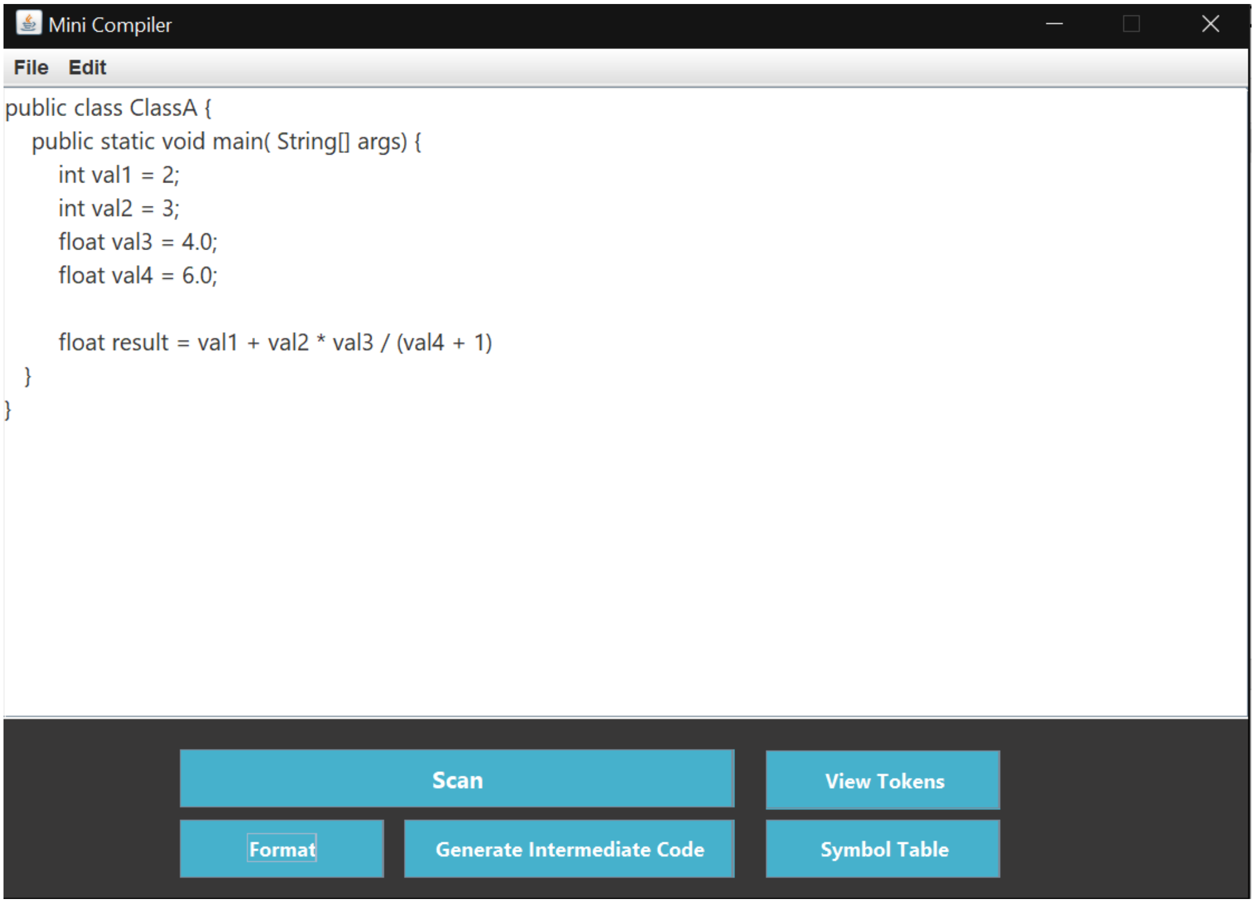


```
public class ClassA {
			public static void main( String[] args) {
						int val1 = 2;
						int val2 = 3;
						float val3 = 4.0;
						float val4 = 6.0;

						float result = val1 + val2 * val3 / (val4 + 1)
			}
}
```

Format the code using format button:

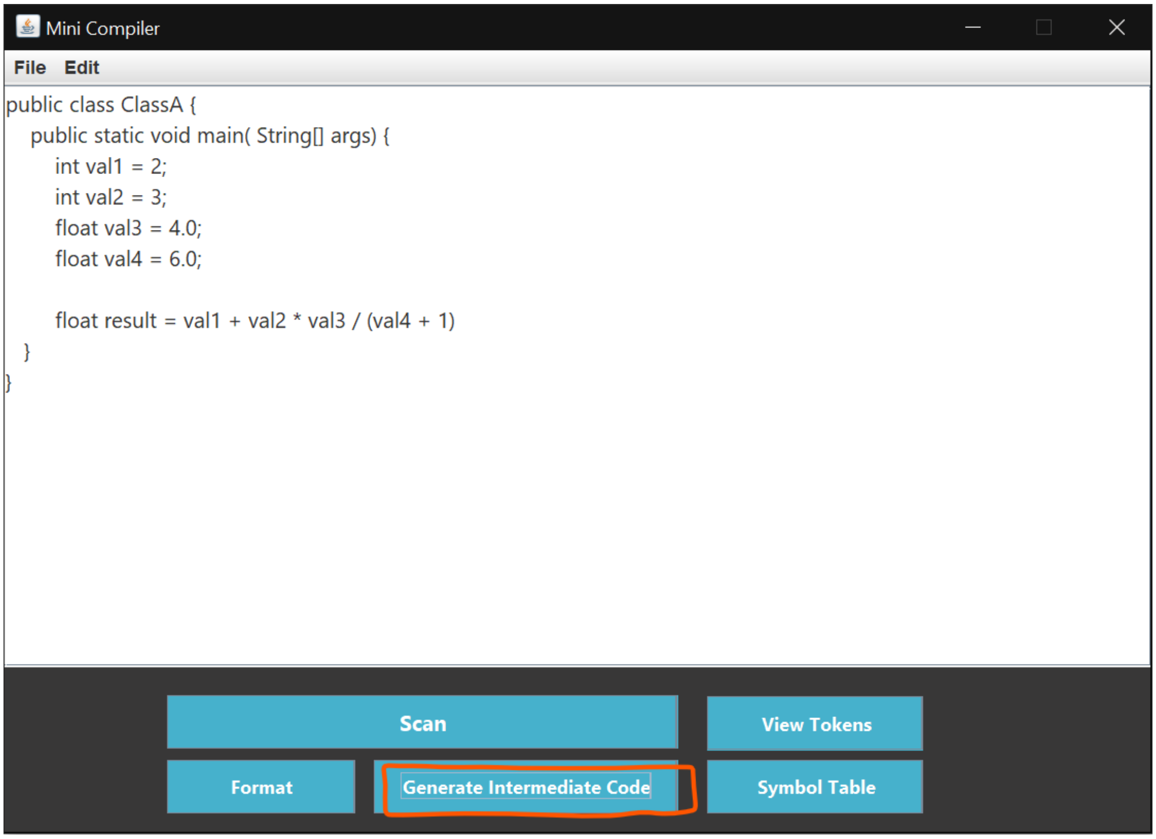


Result of the format is that code is written in a compact and clean form with proper indentation and spaces.



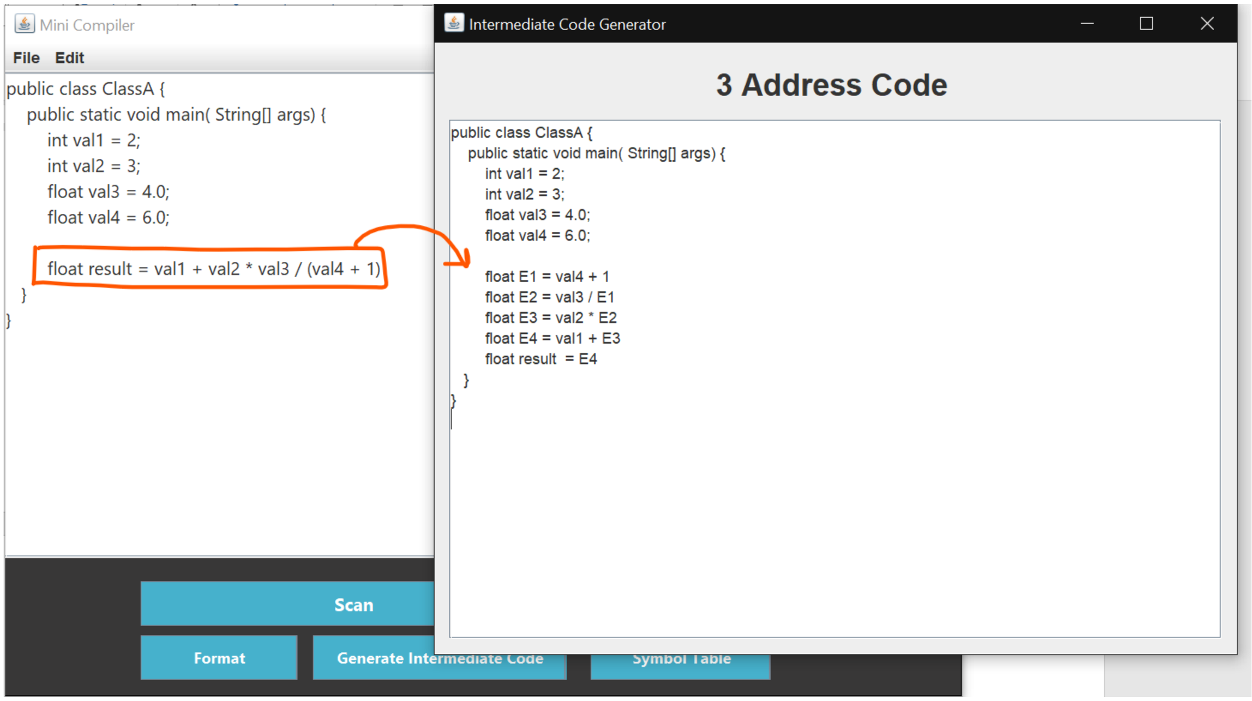
```
public class ClassA {
  public static void main( String[] args) {
     int val1 = 2;
     int val2 = 3;
     float val3 = 4.0;
     float val4 = 6.0;

     float result = val1 + val2 * val3 / (val4 + 1)
  }
}
```

3 Address Code Generation:



```
public class ClassA {
  public static void main( String[] args) {
     int val1 = 2;
     int val2 = 3;
     float val3 = 4.0;
     float val4 = 6.0;

     float result = val1 + val2 * val3 / (val4 + 1)
  }
}
```

The result of generation:

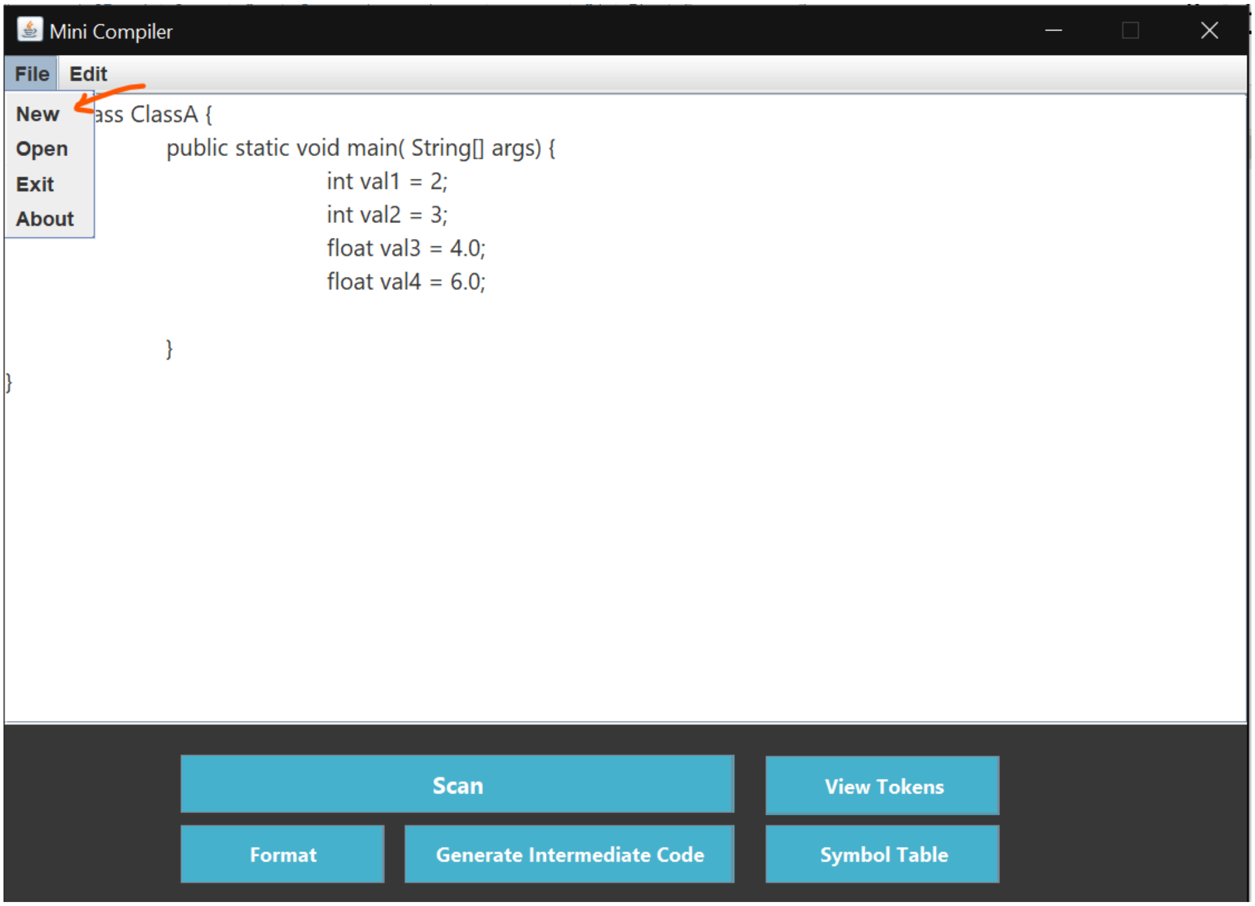


```
public class ClassA {
   public static void main( String[] args) {
      int val1 = 2;
      int val2 = 3;
      float val3 = 4.0;
      float val4 = 6.0;

      float result = val1 + val2 * val3 / (val4 + 1)
  }
}
```

3 Address Code

```
public class ClassA {
   public static void main( String[] args) {
      int val1 = 2;
      int val2 = 3;
      float val3 = 4.0;
      float val4 = 6.0;

      float E1 = val4 + 1
      float E2 = val3 / E1
      float E3 = val2 * E2
      float E4 = val1 + E3
      float result  = E4
  }
}
```

Click “New” to create new code snippet.



```
ass ClassA {
        public static void main( String[] args) {
                        int val1 = 2;
                        int val2 = 3;
                        float val3 = 4.0;
                        float val4 = 6.0;


        }
}
```

END