Project 1 Reposrt

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Contents

1 Java Code analysis

There are 4 java files in the given code base of the experiment. Each file consists of around 3500+ lines of code, most of which are not commented properly. While analyzing the code we identified many code smells of which a few are listed below:

1. Redundant Code- Object oriented features like Inheritence could have been used.

2. Dead Code - Many parts of the code are commented which never used.

3. Comments Missing - The code doest not contain any comments which describe the functionality.

4. Code contains Imports which are not needed.

The following class diagrams were generated for the given code base.

It may be noticed that many of the methods in all the four diagrams are repeatedly used. This could have been done using inheritance.

<<Java Class>>
exp6_latch_positive
(default package)

- exp6_latch_positive()
- init():void
- createAndShowGUI():void

<<Java Class>>
MyPanel
(default package)

- exp_type: int
- scale_x: double
- scale_y: double
- work_x: int
- work_y: int
- wire_button: int
- img_button_pressed: int
- draw_work: int
- work_mat: int[][]
- end_points_mat: int[][]
- wire_mat: int[][]
- wire_points_mat: int[][]
- work_img_width: int
- work_img_height: int
- work_panel_width: int
- work_panel_height: int
- grid_size: int
- node_drag: int
- wire_drag: int
- wire_drag_end: int
- comp_count: int[]
- total_comp: int
- total_wire: int
- fr: JFrame[]
- comp_str: String[]
- MinVolt1: String
- MaxVolt1: String
- RiseTime1: String
- FallTime1: String
- StepSize1: String
- TotalTime1: String
- MinVolt2: String
- MaxVolt2: String
- RiseTime2: String
- FallTime2: String
- StepSize2: String
- TotalTime2: String
- MinVolt3: String
- MaxVolt3: String
- RiseTime3: String
- FallTime3: String
- StepSize3: String
- TotalTime3: String
- simulate_flag: boolean
- img: Image[]
- icon: ImageIcon[]
- icon_simulate: ImageIcon
- icon_graph: ImageIcon
- mt: MediaTracker
- base: URL
- topPanel: JPanel
- simulate_button: JButton
- graph_button: JButton
- exp_list: JComboBox
- layout_button: JButton
- splitPane: JSplitPane
- rightPanel: JPanel
- leftPanel: JPanel
- leftSplitPane: JSplitPane
- toolPanel: JPanel
- toolPanelUp: JPanel
- selected: JButton
- toolPanelDown: JPanel
- leftTool1: JToolBar
- img_button1: JButton[]
- leftTool2: JToolBar
- img_button2: JButton[]

- MyPanel()
- circuit_check():boolean
- change_selected(int):void
- actionPerformed(ActionEvent):void
- mouseMoved(MouseEvent):void
- mouseDragged(MouseEvent):void

<<Java Class>>
graph
(default package)

- fileToRead: String
- strBuff: StringBuffer
- txtArea: TextArea
- myline: String
- l: JLabel
- f1: Font
- time: double[]
- V_D: double[]
- V_clk: double[]
- V_out: double[]
- no_values: int

- graph()
- make_graph():void
- paint(Graphics):void

<<Java Class>>
myDialog
(default package)

- length: JSpinner
- length_model: SpinnerModel
- width_model: SpinnerModel
- length_unit: JComboBox
- width: JSpinner
- width_unit: JComboBox
- capacitance: JSpinner
- capacitance_unit: JComboBox
- minVoltage: JSpinner
- maxVoltage: JSpinner
- riseTime: JSpinner
- fallTime: JSpinner
- stepSize: JSpinner
- totalTime: JSpinner
- cp: Container
- del: JButton
- ok: JButton
- rotate: JButton
- unit: String[]
- node_index: int

- myDialog(JFrame,String,int)
- get_length():String
- get_width():String
- get_capacitance():String
- actionPerformed(ActionEvent):void

<<Java Class>>
WorkPanel
(default package)

- WorkPanel()
- mouseMoved(MouseEvent):void
- mouseDragged(MouseEvent):void
- mouseClicked(MouseEvent):void
- mouseReleased(MouseEvent):void
- mouseEntered(MouseEvent):void
- mouseExited(MouseEvent):void
- mousePressed(MouseEvent):void
- paint(Graphics):void
- draw_2input_mux(Graphics2D,int,int,int,double):void
- draw_inverter(Graphics2D,int,int,int,double):void
- draw_mux(Graphics2D,int,int,int,double):void
- draw_nmos(Graphics2D,int,int,int,double):void
- draw_cmos(Graphics2D,int,int,int,double):void
- draw_capacitor(Graphics2D,int,int,int,double):void
- draw_ground(Graphics2D,int,int,int,double):void
- draw_vdd(Graphics2D,int,int,int,double):void
- draw_input(Graphics2D,int,int,int,double,int):void
- draw_output(Graphics2D,int,int,int,double):void

<<Java Class>>
line
(default package)

- x1: int
- y1: int
- x2: int
- y2: int
- x: int[]
- y: int[]
- end_index: int
- del: boolean

- line(int,int,int,int)
- update2(int,int):void
- update1(int,int):void
- update(int,int):void
- update_wire_mat(int):void
- update_mat(int):void
- del():void

<<Java Class>>
node
(default package)

- node_x: int
- node_y: int
- img_no: int
- comp_no: int
- width: int
- height: int
- virtual_w: int
- virtual_h: int
- angle: double
- angle_count: int
- del: boolean
- end_pointsX: int[]
- end_pointsY: int[]
- count_end_points: int

- node(int,int,int,int,int,int)
- update_end_points_mat(int):void
- make_end_points(int):void
- del():void
- rotate(int):void
- update_mat(int):void
- remove_mat():void
- remove_end_points():void

<<Java Class>>
WA
(default package)

- WA()
- windowClosing(WindowEvent):void

~wavePanel
~dialog 0..1
0..1
~workPanel 0..1
~wire 0..*
comp_node
0..*
~RightPanel

<<Java Class>>
exp6_latch_negative
(default package)

- exp6_latch_negative()
- init():void
- createAndShowGUI():void

<<Java Class>>
MyPanel
(default package)

- exp_type: int
- scale_x: double
- scale_y: double
- work_x: int
- work_y: int
- wire_button: int
- img_button_pressed: int
- draw_work: int
- work_mat: int[][]
- end_points_mat: int[][]
- wire_mat: int[][]
- wire_points_mat: int[][]
- work_img_width: int
- work_img_height: int
- work_panel_width: int
- work_panel_height: int
- grid_size: int
- node_drag: int
- wire_drag: int
- wire_drag_end: int
- comp_count: int[]
- total_comp: int
- total_wire: int
- fr: JFrame[]
- comp_str: String[]
- MinVolt1: String
- MaxVolt1: String
- RiseTime1: String
- FallTime1: String
- StepSize1: String
- TotalTime1: String
- MinVolt2: String
- MaxVolt2: String
- RiseTime2: String
- FallTime2: String
- StepSize2: String
- TotalTime2: String
- MinVolt3: String
- MaxVolt3: String
- RiseTime3: String
- FallTime3: String
- StepSize3: String
- TotalTime3: String
- simulate_flag: boolean
- img: Image[]
- icon: ImageIcon[]
- icon_simulate: ImageIcon
- icon_graph: ImageIcon
- mt: MediaTracker
- base: URL
- topPanel: JPanel
- simulate_button: JButton
- graph_button: JButton
- exp_list: JComboBox
- layout_button: JButton
- splitPane: JSplitPane
- rightPanel: JPanel
- leftPanel: JPanel
- leftSplitPane: JSplitPane
- toolPanel: JPanel
- toolPanelUp: JPanel
- selected: JButton
- toolPanelDown: JPanel
- leftTool1: JToolBar
- img_button1: JButton[]
- leftTool2: JToolBar
- img_button2: JButton[]

- MyPanel()
- circuit_check():boolean
- change_selected(int):void
- actionPerformed(ActionEvent):void
- mouseMoved(MouseEvent):void
- mouseDragged(MouseEvent):void

<<Java Class>>
graph
(default package)

- fileToRead: String
- strBuff: StringBuffer
- txtArea: TextArea
- myline: String
- l: JLabel
- f1: Font
- time: double[]
- V_D: double[]
- V_clk: double[]
- V_out: double[]
- no_values: int

- graph()
- make_graph():void
- paint(Graphics):void

<<Java Class>>
myDialog
(default package)

- length: JSpinner
- length_model: SpinnerModel
- width_model: SpinnerModel
- length_unit: JComboBox
- width: JSpinner
- width_unit: JComboBox
- capacitance: JSpinner
- capacitance_unit: JComboBox
- minVoltage: JSpinner
- maxVoltage: JSpinner
- riseTime: JSpinner
- fallTime: JSpinner
- stepSize: JSpinner
- totalTime: JSpinner
- cp: Container
- del: JButton
- ok: JButton
- rotate: JButton
- unit: String[]
- node_index: int

- myDialog(JFrame,String,int)
- get_length():String
- get_width():String
- get_capacitance():String
- actionPerformed(ActionEvent):void

<<Java Class>>
line
(default package)

- x1: int
- y1: int
- x2: int
- y2: int
- x: int[]
- y: int[]
- end_index: int
- del: boolean

- line(int,int,int,int)
- update2(int,int):void
- update1(int,int):void
- update(int,int):void
- update_wire_mat(int):void
- update_mat(int):void
- del():void

<<Java Class>>
WorkPanel
(default package)

- WorkPanel()
- mouseMoved(MouseEvent):void
- mouseDragged(MouseEvent):void
- mouseClicked(MouseEvent):void
- mouseReleased(MouseEvent):void
- mouseEntered(MouseEvent):void
- mouseExited(MouseEvent):void
- mousePressed(MouseEvent):void
- paint(Graphics):void
- draw_2Input_mux(Graphics2D,int,int,int,double):void
- draw_inverter(Graphics2D,int,int,int,double):void
- draw_mux(Graphics2D,int,int,int,double):void
- draw_nmos(Graphics2D,int,int,int,double):void
- draw_cmos(Graphics2D,int,int,int,double):void
- draw_capacitor(Graphics2D,int,int,int,double):void
- draw_ground(Graphics2D,int,int,int,double):void
- draw_vdd(Graphics2D,int,int,int,double):void
- draw_input(Graphics2D,int,int,int,double,int):void
- draw_output(Graphics2D,int,int,int,double):void

<<Java Class>>
node
(default package)

- node_x: int
- node_y: int
- img_no: int
- comp_no: int
- width: int
- height: int
- virtual_w: int
- virtual_h: int
- angle: double
- angle_count: int
- del: boolean
- end_pointsX: int[]
- end_pointsY: int[]
- count_end_points: int

- node(int,int,int,int,int,int)
- update_end_points_mat(int):void
- make_end_points(int):void
- del():void
- rotate(int):void
- update_mat(int):void
- remove_mat():void
- remove_end_points():void

<<Java Class>>
WA
(default package)

- WA()
- windowClosing(WindowEvent):void

~waveRightPanel 0..1

~dialog 0..*

~wire 0..*

~workPanel 0..1

~comp_node 0..*

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exp6_flipflop_positive — `<<Java Class>>` (default package)
- ◆ exp6_flipflop_positive()
- ● init():void
- ■ createAndShowGUI():void

MyPanel — `<<Java Class>>` (default package)
- △ exp_type: int
- △ scale_x: double
- △ scale_y: double
- △ work_x: int
- △ work_y: int
- △ wire_button: int
- △ img_button_pressed: int
- △ draw_work: int
- △ work_mat: int[][]
- △ end_points_mat: int[][]
- △ wire_mat: int[][]
- △ wire_points_mat: int[][]
- △ work_img_width: int
- △ work_img_height: int
- △ work_panel_width: int
- △ work_panel_height: int
- △ grid_size: int
- △ node_drag: int
- △ wire_drag: int
- △ wire_drag_end: int
- △ comp_count: int[]
- △ total_comp: int
- △ total_wire: int
- △ fr: JFrame[]
- △ comp_str: String[]
- △ MinVolt1: String
- △ MaxVolt1: String
- △ RiseTime1: String
- △ FallTime1: String
- △ StepSize1: String
- △ TotalTime1: String
- △ MinVolt2: String
- △ MaxVolt2: String
- △ RiseTime2: String
- △ FallTime2: String
- △ StepSize2: String
- △ TotalTime2: String
- △ MinVolt3: String
- △ MaxVolt3: String
- △ RiseTime3: String
- △ FallTime3: String
- △ StepSize3: String
- △ TotalTime3: String
- △ simulate_flag: boolean
- △ img: Image[]
- △ icon: ImageIcon[]
- △ icon_simulate: ImageIcon
- △ icon_graph: ImageIcon
- △ mt: MediaTracker
- △ base: URL
- △ topPanel: JPanel
- △ simulate_button: JButton
- △ graph_button: JButton
- △ exp_list: JComboBox
- △ layout_button: JButton
- △ splitPane: JSplitPane
- △ rightPanel: JPanel
- △ leftPanel: JPanel
- △ leftSplitPane: JSplitPane
- △ toolPanel: JPanel
- △ toolPanelUp: JPanel
- △ selected: JButton
- △ toolPanelDown: JPanel
- △ leftTool1: JToolBar
- △ img_button1: JButton[]
- △ leftTool2: JToolBar
- △ img_button2: JButton[]
- ◆ MyPanel()
- ● circuit_check():boolean
- ● change_selected(int):void
- ● actionPerformed(ActionEvent):void
- ● mouseMoved(MouseEvent):void
- ● mouseDragged(MouseEvent):void

line — `<<Java Class>>` (default package)
- △ x1: int
- △ y1: int
- △ x2: int
- △ y2: int
- △ x: int[]
- △ y: int[]
- △ end_index: int
- △ del: boolean
- ◆ line(int,int,int,int)
- ● update2(int,int):void
- ● update1(int,int):void
- ● update(int,int):void
- ● update_wire_mat(int):void
- ● update_mat(int):void
- ● del():void

myDialog — `<<Java Class>>` (default package)
- △ length: JSpinner
- △ length_model: SpinnerModel
- △ width_model: SpinnerModel
- △ length_unit: JComboBox
- △ width: JSpinner
- △ width_unit: JComboBox
- △ capacitance: JSpinner
- △ capacitance_unit: JComboBox
- △ minVoltage: JSpinner
- △ maxVoltage: JSpinner
- △ riseTime: JSpinner
- △ fallTime: JSpinner
- △ stepSize: JSpinner
- △ totalTime: JSpinner
- △ cp: Container
- △ del: JButton
- △ ok: JButton
- △ rotate: JButton
- △ unit: String[]
- △ node_index: int
- ◆ myDialog(JFrame,String,int)
- ▲ get_length():String
- ▲ get_width():String
- ▲ get_capacitance():String
- ● actionPerformed(ActionEvent):void

WorkPanel — `<<Java Class>>` (default package)
- ◆ WorkPanel()
- ● mouseMoved(MouseEvent):void
- ● mouseDragged(MouseEvent):void
- ● mouseClicked(MouseEvent):void
- ● mouseReleased(MouseEvent):void
- ● mouseEntered(MouseEvent):void
- ● mouseExited(MouseEvent):void
- ● mousePressed(MouseEvent):void
- ● paint(Graphics):void
- ▲ draw_latch(Graphics2D,int,int,int,double):void
- ▲ draw_2input_mux(Graphics2D,int,int,int,double):void
- ▲ draw_inverter(Graphics2D,int,int,int,double):void
- ▲ draw_mux(Graphics2D,int,int,int,double):void
- ▲ draw_nmos(Graphics2D,int,int,int,double):void
- ▲ draw_cmos(Graphics2D,int,int,int,double):void
- ▲ draw_capacitor(Graphics2D,int,int,int,double):void
- ▲ draw_ground(Graphics2D,int,int,int,double):void
- ▲ draw_vdd(Graphics2D,int,int,int,double):void
- ▲ draw_input(Graphics2D,int,int,int,double):void
- ▲ draw_output(Graphics2D,int,int,int,double):void

graph — `<<Java Class>>` (default package)
- △ fileToRead: String
- △ strBuff: StringBuffer
- △ txtArea: TextArea
- △ myline: String
- △ l: JLabel
- △ f1: Font
- △ time: double[]
- △ V_D: double[]
- △ V_clk: double[]
- △ V_out: double[]
- △ no_values: int
- ◆ graph()
- ● make_graph():void
- ● paint(Graphics):void

node — `<<Java Class>>` (default package)
- △ node_x: int
- △ node_y: int
- △ img_no: int
- △ comp_no: int
- △ width: int
- △ height: int
- △ virtual_w: int
- △ virtual_h: int
- △ angle: double
- △ angle_count: int
- △ del: boolean
- △ end_pointsX: int[]
- △ end_pointsY: int[]
- △ count_end_points: int
- ◆ node(int,int,int,int,int,int)
- ● update_end_points_mat(int):void
- ● make_end_points(int):void
- ● del():void
- ● rotate(int):void
- ● update_mat(int):void
- ● remove_mat():void
- ● remove_end_points():void

WA — `<<Java Class>>` (default package)
- ▲ WA()
- ● windowClosing(WindowEvent):void

~wire 0..*
~dialog 0..*
~workPanel 0..1
~waveRightPanel 0..1
comp_node 0..*

<<Java Class>>
exp6_flipflop_negative
(default package)

- exp6_flipflop_negative()
- init():void
- createAndShowGUI():void

<<Java Class>>
MyPanel
(default package)

- exp_type: int
- scale_x: double
- scale_y: double
- work_x: int
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- wire_button: int
- img_button_pressed: int
- draw_work: int
- work_mat: int[][]
- end_points_mat: int[][]
- wire_mat: int[][]
- wire_points_mat: int[][]
- work_img_width: int
- work_img_height: int
- work_panel_width: int
- work_panel_height: int
- grid_size: int
- node_drag: int
- wire_drag: int
- wire_drag_end: int
- comp_count: int[]
- total_comp: int
- total_wire: int
- fr: JFrame[]
- comp_str: String[]
- MinVolt1: String
- MaxVolt1: String
- RiseTime1: String
- FallTime1: String
- StepSize1: String
- TotalTime1: String
- MinVolt2: String
- MaxVolt2: String
- RiseTime2: String
- FallTime2: String
- StepSize2: String
- TotalTime2: String
- MinVolt3: String
- MaxVolt3: String
- RiseTime3: String
- FallTime3: String
- StepSize3: String
- TotalTime3: String
- simulate_flag: boolean
- img: Image[]
- icon: ImageIcon[]
- icon_simulate: ImageIcon
- icon_graph: ImageIcon
- mt: MediaTracker
- base: URL
- topPanel: JPanel
- simulate_button: JButton
- graph_button: JButton
- exp_list: JComboBox
- layout_button: JButton
- splitPane: JSplitPane
- rightPanel: JPanel
- leftPanel: JPanel
- leftSplitPane: JSplitPane
- toolPanel: JPanel
- toolPanelUp: JPanel
- selected: JButton
- toolPanelDown: JPanel
- leftTool1: JToolBar
- img_button1: JButton[]
- leftTool2: JToolBar
- img_button2: JButton[]

- MyPanel()
- circuit_check():boolean
- change_selected(int):void
- actionPerformed(ActionEvent):void
- mouseMoved(MouseEvent):void
- mouseDragged(MouseEvent):void

<<Java Class>>
node
(default package)

- node_x: int
- node_y: int
- img_no: int
- comp_no: int
- width: int
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- angle: double
- angle_count: int
- del: boolean
- end_pointsX: int[]
- end_pointsY: int[]
- count_end_points: int

- node(int,int,int,int,int)
- update_end_points_mat(int):void
- make_end_points(int):void
- del():void
- rotate(int):void
- update_mat(int):void
- remove_mat():void
- remove_end_points():void

<<Java Class>>
myDialog
(default package)

- length: JSpinner
- length_model: SpinnerModel
- width_model: SpinnerModel
- length_unit: JComboBox
- width: JSpinner
- width_unit: JComboBox
- capacitance: JSpinner
- capacitance_unit: JComboBox
- minVoltage: JSpinner
- maxVoltage: JSpinner
- riseTime: JSpinner
- fallTime: JSpinner
- stepSize: JSpinner
- totalTime: JSpinner
- cp: Container
- del: JButton
- ok: JButton
- rotate: JButton
- unit: String[]
- node_index: int

- myDialog(JFrame,String,int)
- get_length():String
- get_width():String
- get_capacitance():String
- actionPerformed(ActionEvent):void

<<Java Class>>
graph
(default package)

- fileToRead: String
- strBuff: StringBuffer
- txtArea: TextArea
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- l: JLabel
- f1: Font
- time: double[]
- V_D: double[]
- V_clk: double[]
- V_out: double[]
- no_values: int

- graph()
- make_graph():void
- paint(Graphics):void

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<<Java Class>>
WorkPanel
(default package)

- WorkPanel()
- mouseMoved(MouseEvent):void
- mouseDragged(MouseEvent):void
- mouseClicked(MouseEvent):void
- mouseReleased(MouseEvent):void
- mouseEntered(MouseEvent):void
- mouseExited(MouseEvent):void
- mousePressed(MouseEvent):void
- paint(Graphics):void
- draw_latch(Graphics2D,int,int,int,double):void
- draw_2input_mux(Graphics2D,int,int,int,double):void
- draw_inverter(Graphics2D,int,int,int,double):void
- draw_mux(Graphics2D,int,int,int,double):void
- draw_nmos(Graphics2D,int,int,int,double):void
- draw_cmos(Graphics2D,int,int,int,double):void
- draw_capacitor(Graphics2D,int,int,int,double):void
- draw_ground(Graphics2D,int,int,int,double):void
- draw_vdd(Graphics2D,int,int,int,double):void
- draw_input(Graphics2D,int,int,int,double,int):void
- draw_output(Graphics2D,int,int,int,double):void

<<Java Class>>
line
(default package)

- x1: int
- y1: int
- x2: int
- y2: int
- x: int[]
- y: int[]
- end_index: int
- del: boolean

- line(int,int,int,int)
- update2(int,int):void
- update1(int,int):void
- update(int,int):void
- update_wire_mat(int):void
- update_mat(int):void
- del():void

<<Java Class>>
WA
(default package)

- WA()
- windowClosing(WindowEvent):void

~comp_node
0..*

~dialog 0..* ~waveRightPanel 0..1

~workPanel 0..1

~wire
0..*