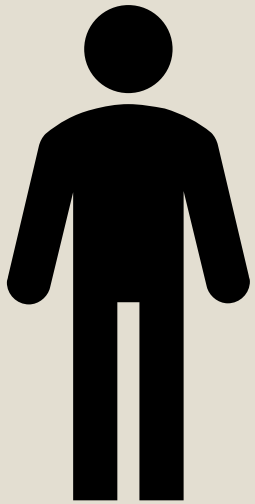
GRUPPE 1

Velkommen til
IN1010 – Uke 14

Plan for dagen

- GUI 2
- Model, view, controller
- Form og farge

Model, View, Controller (MVC)





- Viser brukergrensesnittet og håndterer brukerinteraksjon
- Middle man, kobler sammen view og model. Sørger for at det som vises i view samsvarer med det som er i model
- Inneholder backend logikk og data

```java
static int teller = 0;

Run | Debug
public static void main(String[] args) {

    try {
        UIManager.setLookAndFeel(UIManager.getCrossPlatformLookAndFeelClassName());
    } catch (Exception e) {
        System.exit(1);
    }

    JFrame vindu = new JFrame("Teller");
    vindu.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    vindu.setPreferredSize(new Dimension(500, 300));

    JPanel panel = new JPanel();
    vindu.add(panel);

    JLabel tellerTekst = new JLabel("Tall: " + teller);
    JButton knapp = new JButton("Øk teller");

    knapp.addActionListener(new ActionListener() {
        @Override
        public void actionPerformed(ActionEvent e) {
            teller++;
            tellerTekst.setText("Tall: " + teller);
        }
    });

    panel.add(tellerTekst);
    panel.add(knapp);

    vindu.pack();
    vindu.setLocationRelativeTo(null);
    vindu.setVisible(true);
}
```

Eksempel

- Fra forrige gang
- Alt ligger i en klasse, alt skjer i main
- Går fint for et enkelt program, men kan fort bli uoversiktlig

Model

```java
public class Teller {
    private int tellerVerdi = 0;

    int hentVerdi() {
        return tellerVerdi;
    }

    void oekTeller() {
        ++tellerVerdi;
    }

    void nullstillTeller() {
        tellerVerdi = 0;
    }
}
```

Controller

```java
public class Kontroller {
    private View gui = new View();
    private Teller modell = new Teller();

    public void init() {
        gui.init(this);
    }

    void økTeller() {
        modell.oekTeller();
        int x = modell.hentVerdi();
        gui.oppdaterVerdi(x);
    }

    void nullstillTeller() {
        modell.nullstillTeller();
        int x = modell.hentVerdi();
        gui.oppdaterVerdi(x);
    }

}
```

View

```java
public class View {
    private Kontroller kontroller;
    private JButton økButton, resetButton;
    private JLabel verdiLabel, ledeTekst;
    private JFrame vindu;
    private JPanel panel;

    public void init(Kontroller k) {
        kontroller = k;
        vindu = new JFrame("Teller");
        panel = new JPanel();
        vindu.add(panel);
        vindu.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        vindu.setPreferredSize(new Dimension(300, 100));

        økButton = new JButton(" +1 ");
        økButton.addActionListener(new ØkTeller());

        resetButton = new JButton("Nullstill");
        resetButton.addActionListener(new NullstillTeller());

        verdiLabel = new JLabel("  ");
        ledeTekst = new JLabel("Verdi: ");

        panel.add(ledeTekst);
        panel.add(verdiLabel);
        panel.add(økButton);
        panel.add(resetButton);

        vindu.pack();
        vindu.setLocationRelativeTo(null);
        vindu.setVisible(true);
    }
```

```java
public void oppdaterVerdi(int t) {
    verdiLabel.setText(((Integer) t).toString());
}

class ØkTeller implements ActionListener {
    @Override
    public void actionPerformed(ActionEvent e) {
        kontroller.økTeller();
    }
}

class NullstillTeller implements ActionListener {
    @Override
    public void actionPerformed(ActionEvent e) {
        kontroller.nullstillTeller();
    }
}
```

Form

- Vi kan endre på hvordan elementer legger seg i Jpanel
  - Default er FlowLayout: Elementer legges til etter hverandre i en rad
  - GridLayout: Spesifiserer antall rader og kolonner
  - BorderLayout: Kan legge elementer nord, sør, øst, vest eller i midten

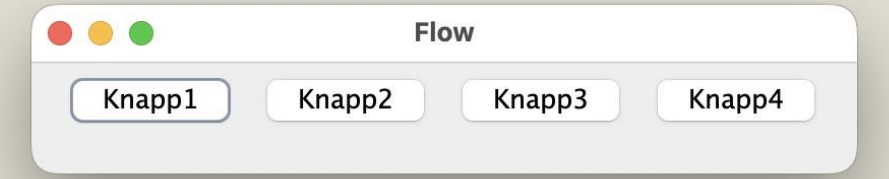
FlowLayout

```
JFrame vindu = new JFrame("Flow");
JPanel panel = new JPanel();
vindu.add(panel);
vindu.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
vindu.setPreferredSize(new Dimension(300, 100));

JButton knapp1 = new JButton("Knapp1");
JButton knapp2 = new JButton("Knapp2");
JButton knapp3 = new JButton("Knapp3");
JButton knapp4 = new JButton("Knapp4");

panel.add(knapp1);
panel.add(knapp2);
panel.add(knapp3);
panel.add(knapp4);

vindu.pack();
vindu.setLocationRelativeTo(null);
vindu.setVisible(true);
```



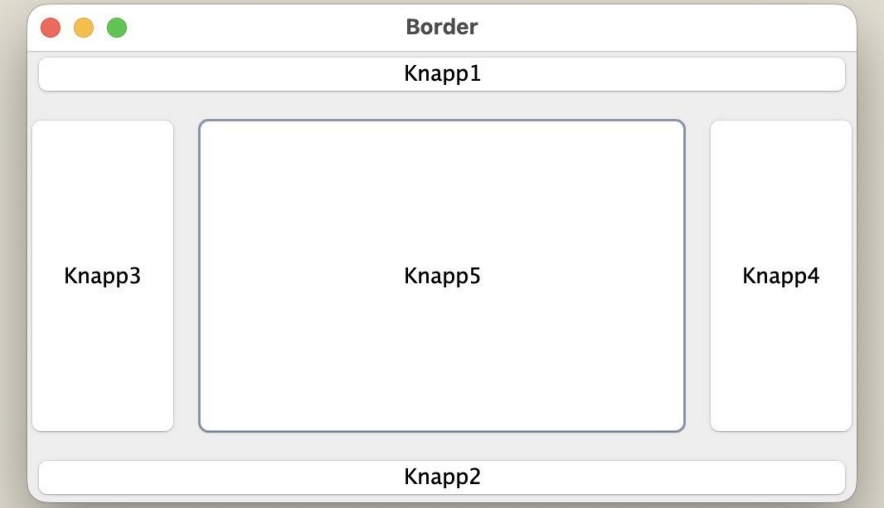
BorderLayout

```
JFrame vindu = new JFrame("Border");
JPanel panel = new JPanel(new BorderLayout(10, 10));
vindu.add(panel);
vindu.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
vindu.setPreferredSize(new Dimension(500, 300));

JButton knapp1 = new JButton("Knapp1");
JButton knapp2 = new JButton("Knapp2");
JButton knapp3 = new JButton("Knapp3");
JButton knapp4 = new JButton("Knapp4");
JButton knapp5 = new JButton("Knapp5");

panel.add(knapp1, BorderLayout.NORTH);
panel.add(knapp2, BorderLayout.SOUTH);
panel.add(knapp3, BorderLayout.WEST);
panel.add(knapp4, BorderLayout.EAST);
panel.add(knapp5, BorderLayout.CENTER);

vindu.pack();
vindu.setLocationRelativeTo(null);
vindu.setVisible(true);
```



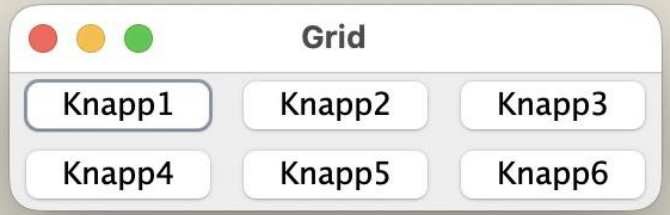
GridLayout

```
JFrame vindu = new JFrame("Grid");
JPanel panel = new JPanel();
vindu.add(panel);
vindu.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

panel.setLayout(new GridLayout(2, 3));
JButton knapp1 = new JButton("Knapp1");
JButton knapp2 = new JButton("Knapp2");
JButton knapp3 = new JButton("Knapp3");
JButton knapp4 = new JButton("Knapp4");
JButton knapp5 = new JButton("Knapp5");
JButton knapp6 = new JButton("Knapp6");

panel.add(knapp1);
panel.add(knapp2);
panel.add(knapp3);
panel.add(knapp4);
panel.add(knapp5);
panel.add(knapp6);

vindu.pack();
vindu.setLocationRelativeTo(null);
vindu.setVisible(true);
```



Farge og font

```
JFrame vindu = new JFrame("Grid");
JPanel panel = new JPanel();
vindu.add(panel);
vindu.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

panel.setLayout(new GridLayout(2, 3));

JButton knapp1 = new JButton("Knapp1");
knapp1.setForeground(Color.RED);

JButton knapp2 = new JButton("Knapp2");
knapp2.setBackground(new Color(0, 0, 255));
knapp2.setForeground(Color.GREEN);

JButton knapp3 = new JButton("Knapp3");
knapp3.setFont(new Font(Font.MONOSPACED, Font.BOLD, 30));

JButton knapp4 = new JButton("Knapp4");
JButton knapp5 = new JButton("Knapp5");
JButton knapp6 = new JButton("Knapp6");

panel.add(knapp1);
panel.add(knapp2);
panel.add(knapp3);
panel.add(knapp4);
panel.add(knapp5);
panel.add(knapp6);

vindu.pack();
vindu.setLocationRelativeTo(null);
vindu.setVisible(true);
```



Oppgaver/trix/oblig