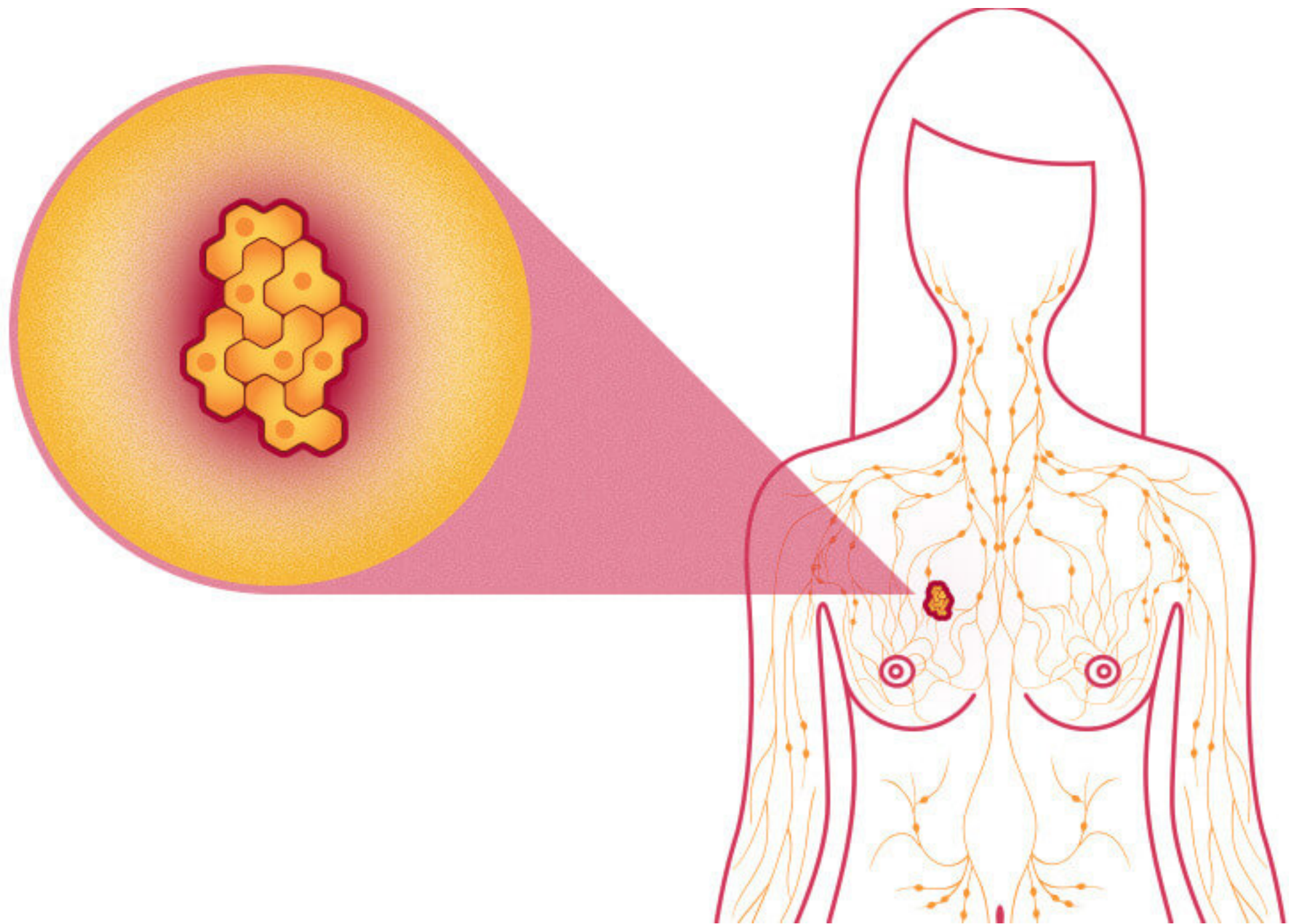


# Breast Cancer Diagnosis Visualization

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# Hypothesis

- How many participants in diagnosis research have tested as Malignant.
- The tissue radius in Malignant patients will increase as cancer progresses.

# How do we get the data?

- Data from <https://www.kaggle.com/uciml/breast-cancer-wisconsin-data>
  - Using the Wisconsin breast cancer diagnostic data set for predictive analysis
- Total participants (600 females)
- Type of Diagnosis( From Breast Tissue)
  - B = Benign(localize not spread)
  - M =Malignant(invade/cancerous growth)
- Testing method: Fine-needle aspiration (FNA)

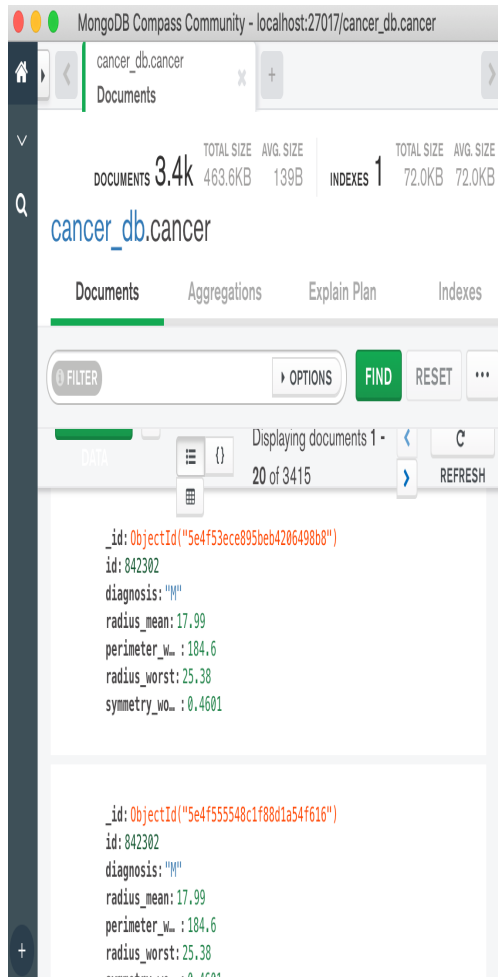
# Fine-Needle Aspiration

- Fine-needle aspiration (FNA) is a diagnostic procedure used to investigate lumps or masses. In this technique, a thin (23–25 gauge), hollow needle is inserted into the mass for sampling of cells that, after being stained, will be examined under a microscope (biopsy). Fine-needle aspiration biopsies are very safe minor surgical procedures.

# Data Processing

- Python : Clean data, select the interested data
- Data storage : MongoDB
- Data Channel : Python\_Flask
- Dashboard: HTML, CSS, Chart.js
- Observe

# Data Processing Continues



```
@app.route("/cancer_db/cancer")

def cancer_db_cancer():

    connection = MongoClient(MONGODB_HOST, MONGODB_PORT)

    collection = connection[DBS_NAME][collection_name]

    cancer = collection.find(projection=FIELDS)

    json_cancer = []

    for row in cancer:

        json_cancer.append(row)

    json_cancer = json.dumps(json_cancer, default=json_util.default)

    connection.close()

    return json_cancer
```

```
{{"radius_mean": 17.99, "radius_worst": 25.38}, {"radius_mean": 17.99, "radius_worst": 25.38}, {"radius_mean": 20.57, "radius_worst": 24.99}, {"radius_mean": 19.69, "radius_worst": 23.57}, {"radius_mean": 11.42, "radius_worst": 14.91}, {"radius_mean": 20.29, "radius_worst": 22.54}, {"radius_mean": 12.45, "radius_worst": 15.47}, {"radius_mean": 18.25, "radius_worst": 22.88}, {"radius_mean": 13.71, "radius_worst": 17.06}, {"radius_mean": 13.0, "radius_worst": 15.49}, {"radius_mean": 12.46, "radius_worst": 15.09}, {"radius_mean": 16.02, "radius_worst": 19.19}, {"radius_mean": 15.78, "radius_worst": 20.42}, {"radius_mean": 19.17, "radius_worst": 20.96}, {"radius_mean": 15.85, "radius_worst": 16.84}, {"radius_mean": 13.73, "radius_worst": 15.03}, {"radius_mean": 14.54, "radius_worst": 17.46}, {"radius_mean": 14.68, "radius_worst": 19.07}, {"radius_mean": 16.13, "radius_worst": 20.96}, {"radius_mean": 19.81, "radius_worst": 27.32}, {"radius_mean": 13.54, "radius_worst": 15.11}, {"radius_mean": 13.08, "radius_worst": 14.5}, {"radius_mean": 9.504, "radius_worst": 10.23}, {"radius_mean": 15.34, "radius_worst": 18.07}, {"radius_mean": 21.16, "radius_worst": 29.17}, {"radius_mean": 16.65, "radius_worst": 26.46}, {"radius_mean": 17.14, "radius_worst": 22.25}, {"radius_mean": 14.58, "radius_worst": 17.62}, {"radius_mean": 18.61, "radius_worst": 21.31}, {"radius_mean": 15.3, "radius_worst": 20.27}, {"radius_mean": 17.57, "radius_worst": 20.01}, {"radius_mean": 18.62, "radius_worst": 22.16}, {"radius_mean": 11.84,
```

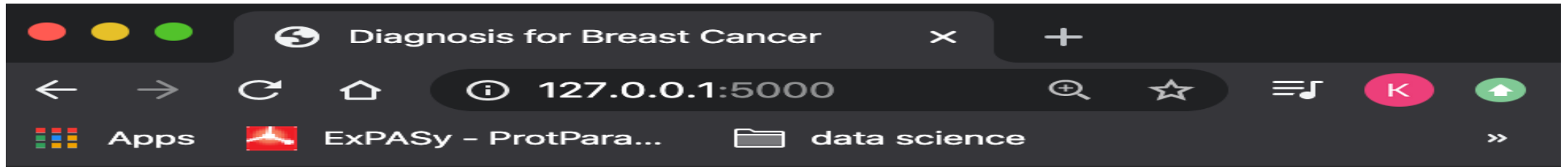
```
<script>
const api_url = "http://127.0.0.1:5000/cancer_db/cancer"

async function getRadius(){
    const response = await fetch(api_url);
    const data = await response.json();
    const { radius_mean, radius_worst } = data ;
    document.getElementById("radius_mean").textContent = radius_mean;
    document.getElementById("radius_worst").textContent = radius_worst;
    console.log(radius_mean)
    console.log(radius_worst)
}

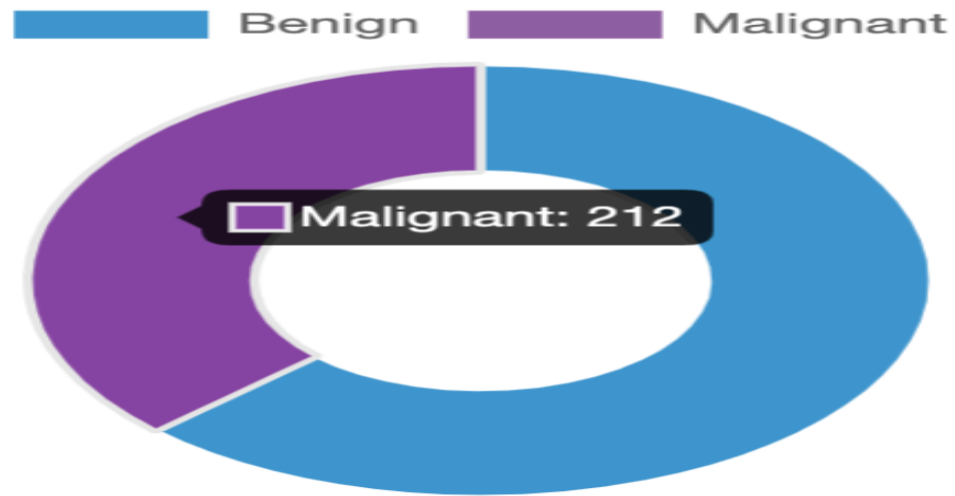
getRadius();

```

# Visualization (Malignant vs Benign)

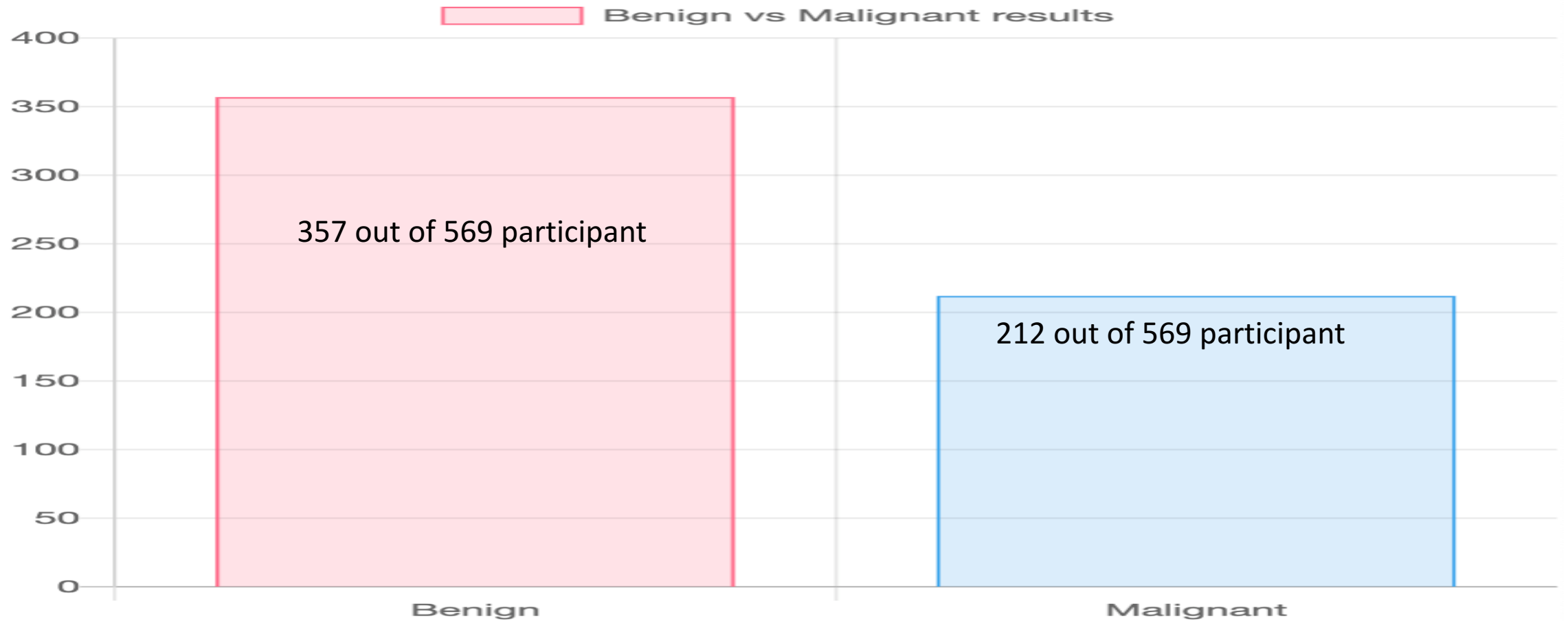
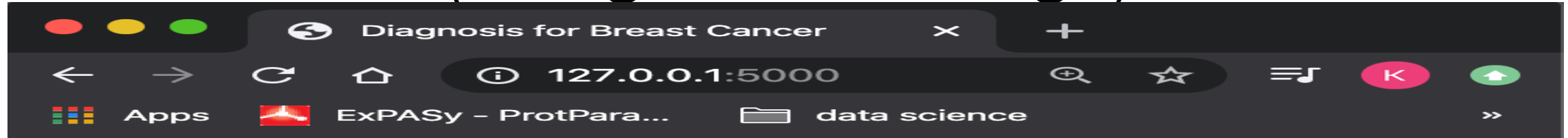


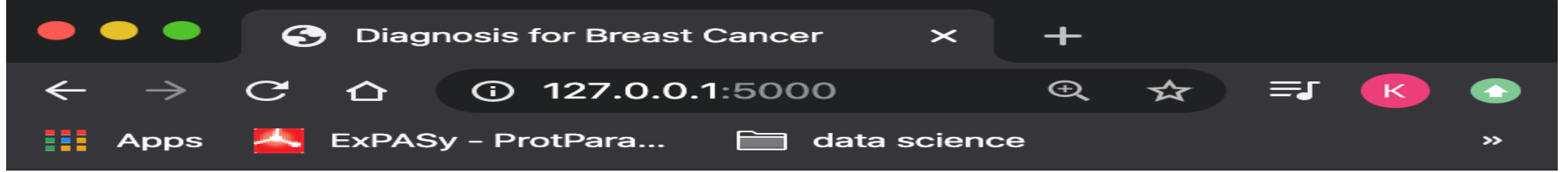
**Predicted Breast Cancer results**



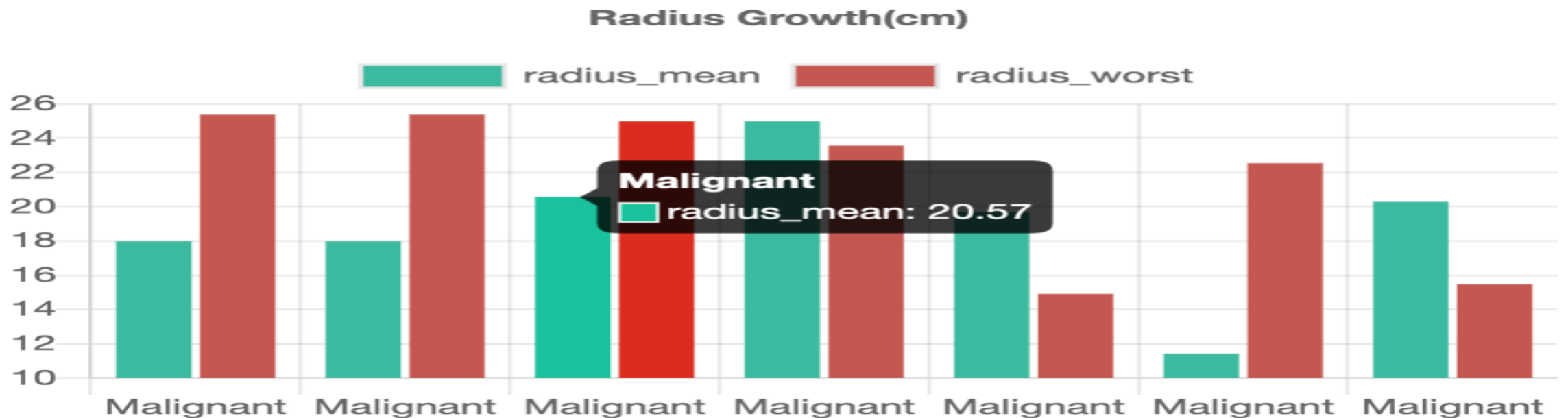


# Visualization (Malignant vs Benign)





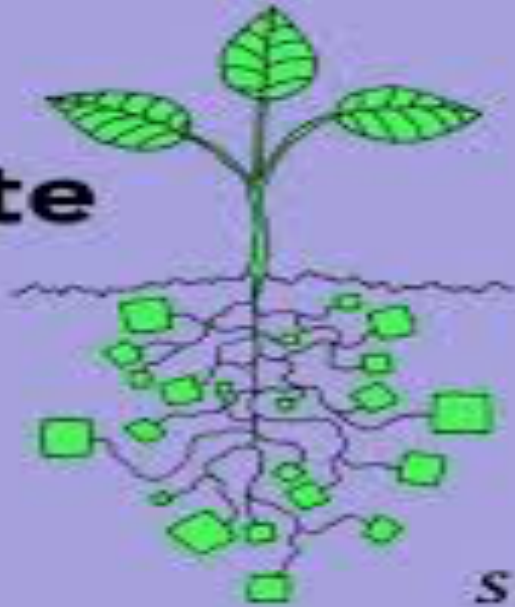
As we expected, The radius of Malignant patient's tissue is getting worse as the disease progress.



# Observation

- 37% of Participants have been diagnosed as Malignant patients.
- The tissue radius in Malignant patients will increase a progress!!
- Should Females use FNA for Breast Cancer diagnosis?

**Why do  
plants hate  
math?**



Because it  
gives them  
*square roots.*

Question?