

# KNN Classifier API Documentation

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## Base URL

```
http://<server-host>:5000/api
```

All endpoints are prefixed with `/api` because the Flask app uses a **Blueprint**.

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## Endpoints Overview

Endpoint	Method	Description
<code>/health</code>	GET	Check if the API is running and model is loaded
<code>/info</code>	GET	Provides model information and features
<code>/predict</code>	POST	Predict whether a user will purchase

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### 1 Health Check

- **URL:** `/api/health`
- **Method:** `GET`
- **Description:** Returns the status of the API and confirms the model is loaded.

#### Response Example:

```
{  
    "status": "UP",  
    "model_loaded": true  
}
```

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### 2 Info Endpoint

- **URL:** `/api/info`
- **Method:** `GET`
- **Description:** Provides information about the model, including features and purpose.

#### Response Example:

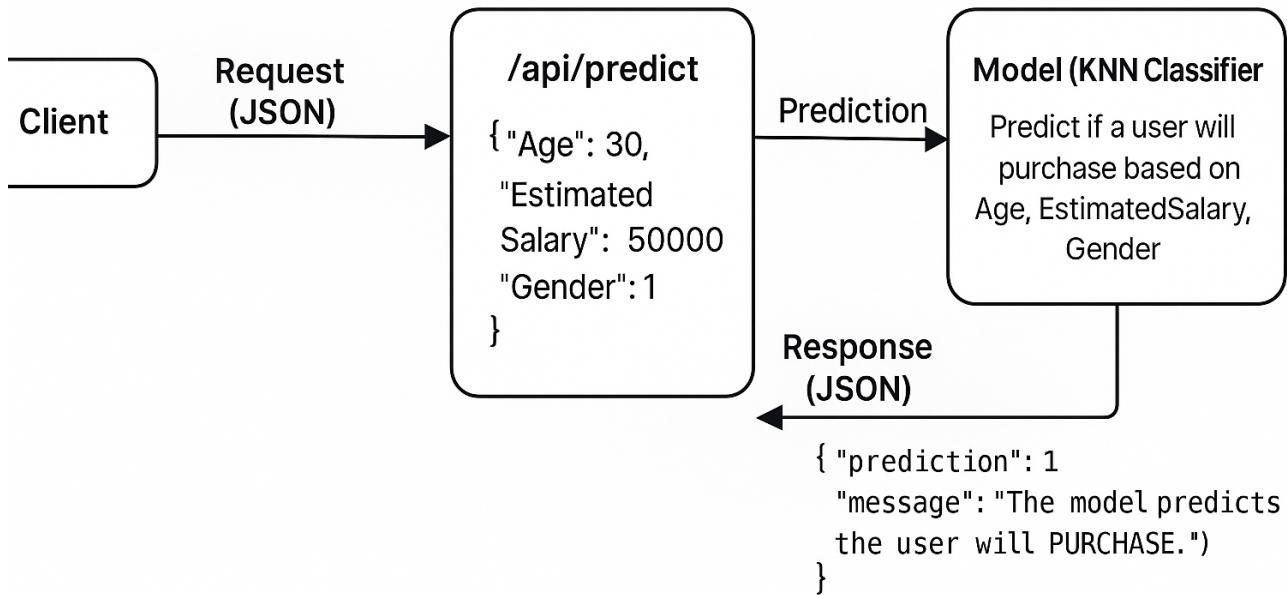
```
{  
    "model": "KNN Classifier",  
    "description": "Predict if a user will purchase based on Age,"
```

```

    "EstimatedSalary, Gender",
    "features": [ "Age", "EstimatedSalary", "Gender"]
}

```

## 3 Predict Endpoint



- **URL:** /api/predict
- **Method:** POST
- **Description:** Predicts whether a user will purchase a product using the KNN model.

### Request Format:

```
{
  "Age": <integer>,
  "EstimatedSalary": <integer>,
  "Gender": <0 or 1>
}
```

- **Age:** User's age (integer)
- **EstimatedSalary:** Estimated salary of the user (integer)
- **Gender:** Gender of the user (0 = Female, 1 = Male)

### Example Request:

```
{  
    "Age": 30,  
    "EstimatedSalary": 50000,  
    "Gender": 1  
}
```

### Response Format:

```
{  
    "prediction": <0 or 1>,  
    "message": "<Friendly message>"  
}
```

### Example Response:

```
{  
    "prediction": 1,  
    "message": "The model predicts the user will PURCHASE."  
}
```

### Error Response Example (missing input):

```
{  
    "error": "No input data provided"  
}
```

### Error Response Example (invalid input):

```
{  
    "error": "could not convert string to float: 'abc'"  
}
```

## Usage Example (Python)

```
import requests  
  
url = "http://127.0.0.1:5000/api/predict"  
data = {  
    "Age": 30,  
    "EstimatedSalary": 50000,
```

```
"Gender": 1  
}  
  
response = requests.post(url, json=data)  
print(response.json())
```

### Expected Output:

```
{  
    "prediction": 1,  
    "message": "The model predicts the user will PURCHASE."  
}
```

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## Notes

- The API uses a **pre-trained KNN model** saved as `models/knn_model.pkl`.
- Predictions are scaled using a **StandardScaler**.
- Make sure all fields in the request are numeric and valid.
- The API is structured using **Flask Blueprints** for modularity and future expansion.