

## **Lessons Learned:**

Knowing from this article is that there were gained some significant lessons which were an indication that AI has the potential to come up with equal to a real life solutions. Data preprocessing is highly crucial initially, as well as during the data preparation so that the model will give the best results. Alternatively, the choice and sometimes even modification of machine learning algorithms, to some extent, affects the quality of the model and therefore the existence of this comparison shows how much this affects the outcome of the model. Furthermore, the ability to translate and present information in straightforward and effectual terms will expedite decisions foundations and thereby enhancing the influence of AI on practical scenarios.

## **Real-Life Applications:**

### **Healthcare Diagnostics Optimization:**

Taking the knowledge learned from the breast cancer classification process as an example, in real life situation, it is possible to optimize healthcare tools of cancer screening programs. This AI capability will be embodied by classifiers/computers, which will be able to detect cancerous lesions in images acquired during the mammograms or histology procedure with a high level of accuracy and as a result, enhance the effectiveness and efficiency of the clinical diagnostic workflow. This is how aatrothra approach making visible the early cancerous abnormalities allowing timely intervention and better outcomes in patients.

### **Financial Services Personalization:**

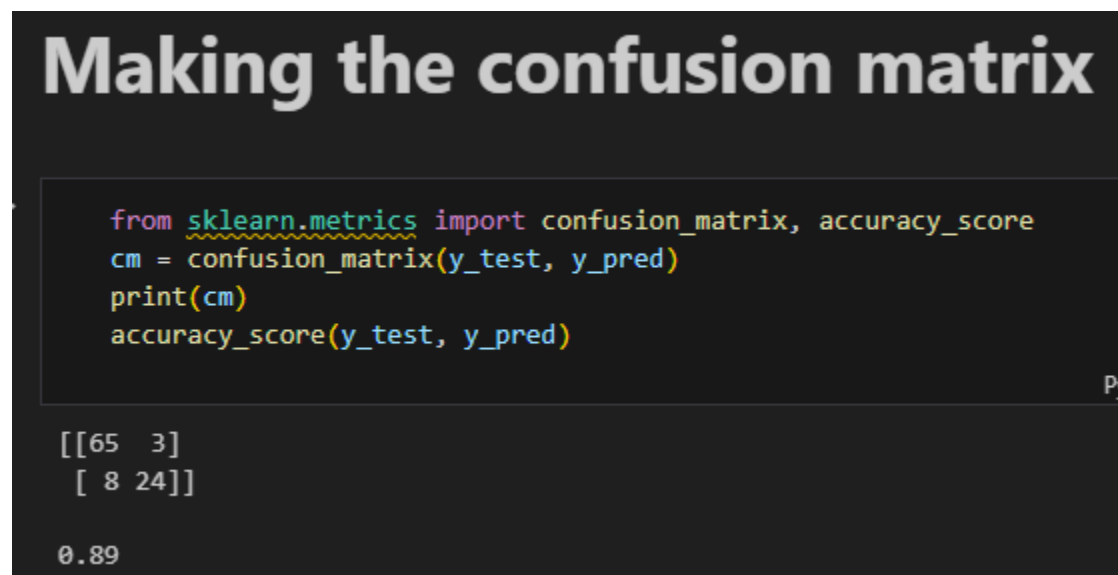
Building the relevant thoughts from customer insurance purchases case an other application could be about needs-basis financial services offerings using data-driven customer behavioral analysis. Financials which employ machine learning can be good at analysing which customers are likely to

accept insurance offers and what each of them may require since the learning systems utilise history data related to demographics, transactions, and online behaviors to develop predictive models. With this personalized strategy, the Joyful Cafe boosts client satisfaction, creates lasting partnerships, and generates higher profits.

In both instances, the AI algorithms permit data-based decision making, lowers the efforts of process marked and resources optimization thus delivering the customized solutions compatible with the exact needs of their targets. Implementing and reflecting upon the outcomes of projects where AI was applied in an integrated way can help organizations in their quest to innovate and gain a competitive advantage as well as monetize their activities.

## Confusion Matrix:

### 1. Logistic regression: 89%



```
Making the confusion matrix

from sklearn.metrics import confusion_matrix, accuracy_score
cm = confusion_matrix(y_test, y_pred)
print(cm)
accuracy_score(y_test, y_pred)

[[65  3]
 [ 8 24]]

0.89
```

## 2. KNN: 93%

### Confusion Matrix

```
from sklearn.metrics import confusion_matrix, accuracy_score
cm = confusion_matrix(y_test, y_pred)
print(cm)
accuracy_score(y_test, y_pred)
```

```
[[64  4]
 [ 3 29]]
```

```
0.93
```

## 3. Decision tree: 91%

### Making the confusion matrix

```
> from sklearn.metrics import confusion_matrix, accuracy_score
cm = confusion_matrix(y_test, y_pred)
print(cm)
accuracy_score(y_test, y_pred)
```

```
· [[63  5]
   [ 4 28]]
```

```
· 0.91
```

#### 4. Support vector machine: 90%

```
from sklearn.metrics import confusion_matrix, accuracy_score
cm = confusion_matrix(y_test, y_pred)
print(cm)
accuracy_score(y_test, y_pred)
```

```
[[66  2]
 [ 8 24]]
```

```
0.9
```

#### 5. Random search: 91%

### Making the confusion matrix

```
> from sklearn.metrics import confusion_matrix, accuracy_score
cm = confusion_matrix(y_test, y_pred)
print(cm)
accuracy_score(y_test, y_pred)
```

```
· [[63  5]
  [ 4 28]]
```

```
· 0.91
```

Therefor by seeing the results of confusion matrix for different methods we can tell that KNN is the best module for analyzing Customer Insurance Purchases Case Study