BAB V
KESIMPULAN DAN SARAN

5.1 Kesimpulan

Setelah melakukan penelitian tentang pengaplikasian *machine learning* dalam memprediksi temperatur kolom distilasi reaktif, didapatkan beberapa kesimpulan sebagai berikut:

1. Temperatur kolom distilasi reaktif dapat diprediksi menggunakan *machine learning* dengan model LSTM.
2. Model LSTM dengan metode optimasi Adam merupakan model dengan akurasi paling baik dalam memprediksi temperatur kolom distilasi reaktif untuk produksi DME.
3. *Hyperparameter* yang paling baik untuk model LSTM dalam memprediksi temperatur untuk variasi rasio refluks adalah metode optimasi adam dengan *learning rate* sebesar 0,1, jumlah *neuron* sebanyak 150, *batch size* sebesar 64, dan jumlah *epoch* sebanyak 200.
4. *Hyperparameter* yang paling baik untuk model LSTM dalam memprediksi temperatur untuk variasi *reboiler duty* adalah metode optimasi adam dengan *learning rate* sebesar 0,1, jumlah *neuron* sebanyak 150, *batch size* sebesar 128, dan jumlah *epoch* sebanyak 200.
5. Korelasi antara variabel terhadap data *output* sangat berpengaruh terhadap kinerja *machine learning* dalam memprediksi data.
6. Keakuratan model LSTM dengan metode optimasi Adam dalam memprediksi temperatur kolom distilasi reaktif dapat dilihat melalui nilai MSE dan R^2, nilai MSE yang paling bagus adalah 0,415 dan nilai R^2 yang paling baik adalah 0,869.
7. Perbandingan antara data hasil prediksi model LSTM dan data asli dapat dilihat pada gambar 4.9 dan gambar 4.10

5.2 Saran

Berdasarkan kesimpulan-kesimpulan di atas, adapun beberapa saran yang dapat diberikan untuk penelitian selanjutnya adalah sebagai berikut:

1. Melakukan proses pelatihan model *machine learning* dengan jumlah data yang lebih banyak dan lebih variatif
2. Melakukan metode *early stopping* saat pelatihan model *machine learning* untuk menghindari *overfitting* model.

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