🚀 Quick Start: Deploy Machhi to Oracle Cloud Free Tier

⚡ Automated Setup (Recommended)

1. Launch Oracle Cloud Ubuntu Instance

- **Shape**: VM.Standard.A1.Flex (AMD-based, Free Tier)
- **OCPU**: 4, **Memory**: 24 GB
- **Storage**: 200 GB
- **OS**: Ubuntu 22.04

2. Upload Files to Server

```
# Upload your project files
scp -r /path/to/machhi ubuntu@<your-instance-ip>:~

# Or clone from GitHub
ssh ubuntu@<your-instance-ip>
git clone https://github.com/yourusername/machhi.git
```

3. Run Automated Setup

```
# Make script executable and run
chmod +x oracle-cloud-setup.sh
./oracle-cloud-setup.sh
```

4. Configure Domain (Optional)

```
# Point your domain to the instance IP
# Then run SSL setup
sudo certbot --nginx -d yourdomain.com -d www.yourdomain.com
```

🎯 Manual Setup Steps

If you prefer manual setup, follow these steps:

1. Server Preparation

```
# Update system
sudo apt update && sudo apt upgrade -y
```

```
# Install Node.js, PostgreSQL, Nginx
sudo apt install -y postgresql postgresql-contrib nginx nodejs npm

# Install PM2
sudo npm install -g pm2
```

2. Database Setup

```
# Start PostgreSQL
sudo systemctl start postgresql

# Create database
sudo -u postgres createdb machhi_db
sudo -u postgres createuser machhi_user
sudo -u postgres psql -c "ALTER USER machhi_user PASSWORD 'your_password';"
sudo -u postgres psql -c "GRANT ALL PRIVILEGES ON DATABASE machhi_db TO
machhi_user;"
```

3. Application Setup

```
# Install dependencies
cd backend && npm install
cd ../frontend && npm install

# Build frontend
cd frontend && npm run build

# Seed database
cd ../backend
npm run seed
npm run seed-products
```

4. Configure Nginx

```
# /etc/nginx/sites-available/machhi
server {
    listen 80;
    server_name your-domain.com;

    location / {
        root /path/to/frontend/build;
        try_files $uri $uri/ /index.html;
    }

    location /api {
```

```
        proxy_pass http://localhost:5000;
    }
}
```

5. Start Services

```
# Start backend
pm2 start backend/index.js --name machhi-backend
pm2 startup && pm2 save

# Start Nginx
sudo systemctl start nginx
```

🔧 Environment Configuration

Backend (.env)

```
NODE_ENV=production
PORT=5000
JWT_SECRET=your_secure_jwt_secret
DATABASE_URL=postgresql://machhi_user:password@localhost:5432/machhi_db
UPLOAD_PATH=/var/www/machhi/uploads
```

Frontend (.env)

```
REACT_APP_API_URL=http://your-domain.com
```

📊 Free Tier Resources Used

Service	Free Tier Limit	Your Usage
Compute VM	2 VMs (AMD)	1 VM (4 OCPU, 24 GB)
Block Storage	200 GB	~50 GB
PostgreSQL	Self-managed	Included
Load Balancer	1 instance	Not used
Object Storage	20 GB	For images (optional)

🛡 Security Checklist

- ☐ Changed default database password
- ☐ Updated JWT secret to random string

- ☐ Configured firewall (UFW)
- ☐ Disabled root SSH login
- ☐ Set up SSL certificate
- ☐ Enabled fail2ban
- ☐ Set up automated backups

📈 Scaling Considerations

When Your App Grows:

1. **Database**: Upgrade to Oracle Autonomous Database
2. **Compute**: Add load balancer and multiple instances
3. **Storage**: Use Object Storage for all file uploads
4. **CDN**: Use Oracle Cloud CDN for static assets

🔍 Monitoring Commands

```
# Check app status
pm2 status
pm2 logs machhi-backend

# Check web server
sudo systemctl status nginx
sudo tail -f /var/log/nginx/access.log

# Check database
sudo -u postgres psql -d machhi_db -c "SELECT COUNT(*) FROM products;"

# Check disk usage
df -h
du -sh /var/www/machhi
```

🚨 Common Issues & Fixes

App not starting:

```
cd /var/www/machhi/backend
pm2 delete machhi-backend
pm2 start index.js --name machhi-backend
```

Nginx errors:

```
sudo nginx -t
sudo systemctl reload nginx
```

Database connection issues:

```
# Check if PostgreSQL is running
sudo systemctl status postgresql

# Test connection
psql postgresql://machhi_user:password@localhost:5432/machhi_db
```

SSL issues:

```
# Check certificates
sudo certbot certificates

# Renew certificates
sudo certbot renew
```

🎉 Success Checklist

- ☐ App accessible at http://your-domain.com
- ☐ Admin login works (admin@fishapp.com / admin123)
- ☐ Products display on landing page
- ☐ User registration works
- ☐ SSL certificate active (HTTPS)
- ☐ Database backups configured
- ☐ Monitoring tools set up

📞 Support

If you encounter issues:

1. Check the logs: `pm2 logs machhi-backend`
2. Verify environment variables
3. Test database connectivity
4. Check firewall rules
5. Review Oracle Cloud security lists

Your Machhi fish delivery app is now live on Oracle Cloud Free Tier! 🐟☁️